TRAFFIC IMPACT STUDY

PROPOSED RESIDENTIAL SUBDIVISION

12,909 KENNEDY ROAD

PART OF LOT 22, CONCESSION 2

TOWN OF CALEDON

TOWN FILE NO. PRE 2023-0305

PREPARED FOR

TRENDS DEVELOPMENT INC.

SEPTEMBER 20TH 2024

CANDEVCON GROUP INC.
CONSULTING ENGINEERS & PLANNERS
TEL (905) 794-0600 FAX (905) 794-0611

PROJECT NO. W22068

TRAFFIC IMPACT STUDY

PROPOSED RESIDENTIAL SUBDIVISION

12,909 KENNEDY ROAD

PART OF LOT 22, CONCESSION 2

TOWN OF CALEDON

TOWN FILE NO. PRE 2023-0305

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PROJECT NO. W22068

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1. INTRODUCTION

CANDEVCON GROUP INC. was retained by Trends Development Inc. to undertake a Traffic Impact Study for a proposed Residential Subdivision at 12,909 Kennedy Road, which is immediately east of Kennedy Road North and south of Old School Road in the Town of Caledon. **Figure 1** illustrates the location of the Subject Site.

As a requirement of the approval process, the Town of Caledon requires the preparation of a Traffic Impact Study to support the proposed Residential Subdivision and to examine the implications of the proposed Residential Subdivision on the adjacent transportation infrastructure.

Study parameters, assumptions and analytical approaches were presented through the terms of reference and were submitted to the Town of Caledon staff. The terms of reference and the comments received are provided in **Appendix A**.

It is anticipated that the proposed Residential Subdivision will be fully built-out and occupied by 2028. As a result, the study will analyze the traffic operations during 2033 and 2038, which represents the five (5) year and ten (10) year post full build-out.

The purpose of this Study is to determine the traffic impacts of the proposed Residential Subdivision on the surrounding road network and at nearby intersections.

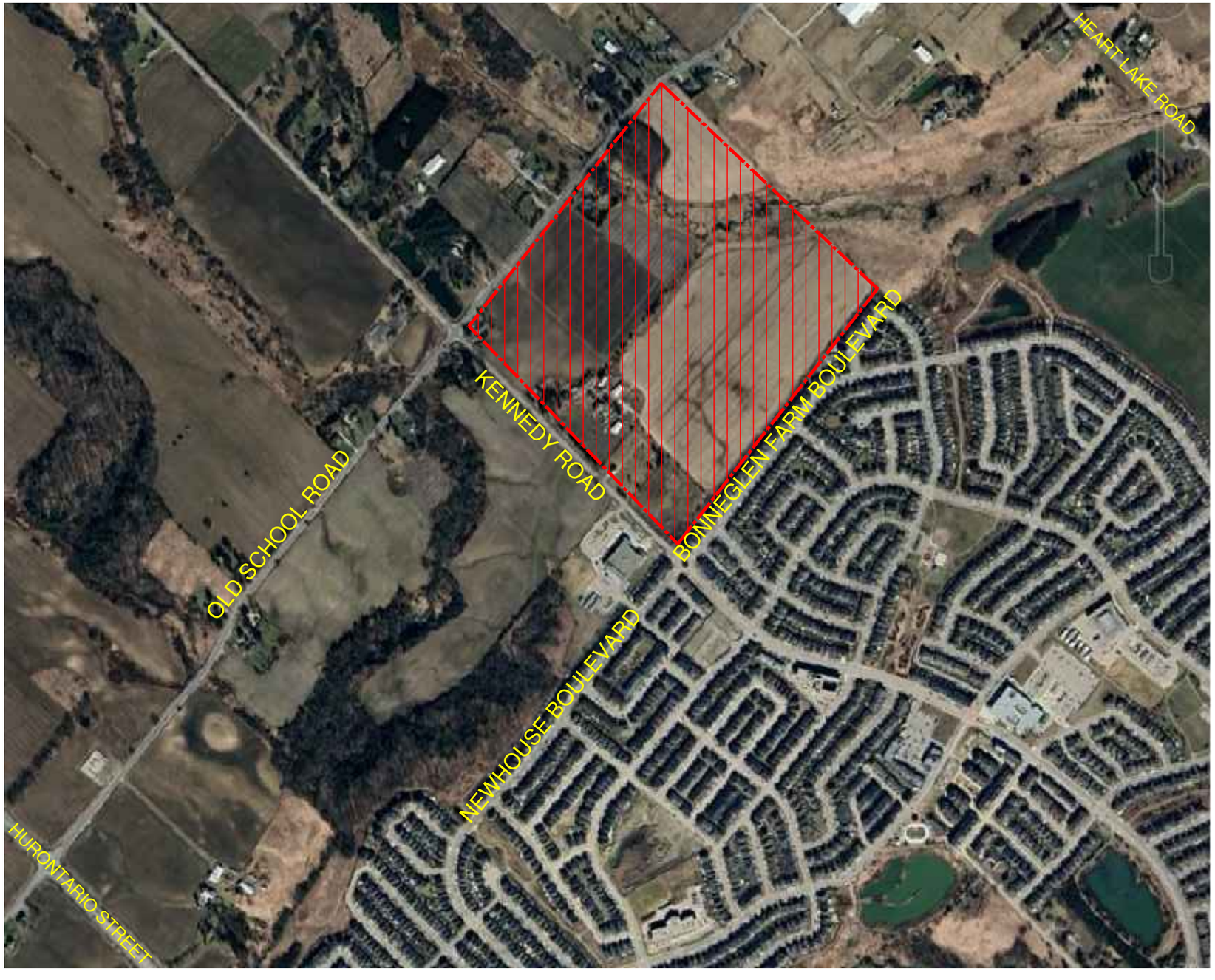
The Traffic Impact Study analyzes the future operations at the following intersections:

- Old School Road at Kennedy Road,
- Bonnieglen Farm Boulevard/Newhouse Boulevard at Kennedy Road,
- Street ‘A’/proposed Collector Road at Kennedy Road,
- Street ‘C’/proposed Local Road at Kennedy Road,
- Street ‘B’ at Old School Road.

1. INTRODUCTION (CONT'D)

The Old School Road at Kennedy Road and Bonnieglen Farm Boulevard/Newhouse Boulevard at Kennedy Road intersections were studied under the Existing (2024), Future (2033 & 2038) Total Background and Future (2033 & 2038) Total Traffic scenarios. The Street 'A'/proposed Collector Road at Kennedy Road and Street 'C'/proposed Local Road at Kennedy Road intersections were studied under the Future (2033 & 2038) Total Background and Future (2033 & 2038) Total Traffic scenarios. The Street 'B' at Old School Road intersection was studied under the Future (2033 & 2038) Total Traffic scenario.

The Traffic Impact Study addresses the traffic operations during the Weekday A.M. and Weekday P.M. Peak Hours.



LEGEND:

SITE

TRENDS DEVELOPMENT INC.
PROPOSED RESIDENTIAL SUBDIVISION

LOCATION PLAN

12909 KENNEDY ROAD
PART OF LOT 22, CONCESSION 2
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL

CANDEVCON GROUP INC.
CONSULTING ENGINEERS AND PLANNERS
9358 GOREWAY DRIVE BRAMPTON, ONTARIO L6P 0M7
TEL. (905) 794-0600 FAX (905) 794-0611

DATE	APRIL. 16th 2024	PROJECT No	W22068
DRAWN	S.N.	FIGURE No.	1
SCALE	N.T.S		

2. SUBJECT DEVELOPMENT – STUDY AREA

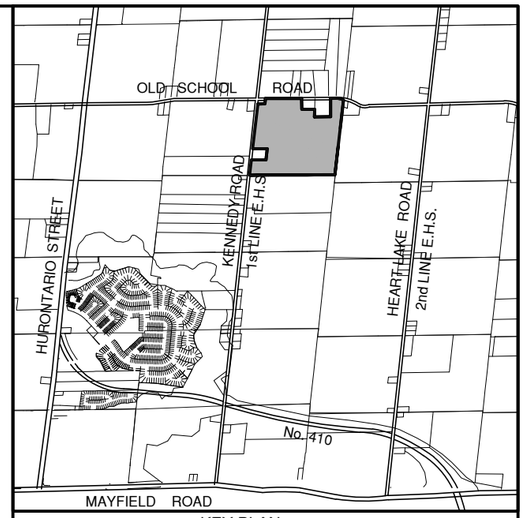
The Subject Development is located immediately east of Kennedy Road North and south of Old School Road. The total area of the Subject Development is 91.1 acres.

The Subject Development is surrounded by the following land uses:

- To the north, Old School Road with agricultural lands beyond,
- To the east, Agricultural Lands and a tributary to the Humber River,
- To the south, Bonnieglen Farm Boulevard and existing residential,
- To the west, Kennedy Road with proposed residential lands beyond (POPA 2021-0009).

The proposed Residential Subdivision comprises 230 single detached homes, 56 semi-detached homes and 99 street townhouse units along with three (3) medium density (condominium) blocks and a block with a mixed use/mid-rise portion and a residential (special) portion.

As illustrated in the Preliminary Road Plan (**Figure 2**) for the proposed Residential Subdivision that is based on the Draft Plan of Subdivision, Street 'A' and Street 'C' will align with a road provided by the proposed Developments that are owned by Argo Kennedy Limited and connect with Kennedy Road to form a four-legged intersection. Street 'B' will connect with Old School Road to form a T-intersection. In addition, Street 'I' will extend immediately south of the Subject Property to connect with Bonnieglen Farm Boulevard to form a T-intersection.



KEY PLAN
N.T.S

TRENDS DEVELOPMENT INC.
PROPOSED RESIDENTIAL SUBDIVISION

PRELIMINARY ROAD PLAN

12909 KENNEDY ROAD
PART OF LOT 22, CONCESSION 2
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL

CANDEVCON GROUP INC.
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TEL. (905) 794-0600 FAX (905) 794-0611

DATE	SEPT. 10th 2024	PROJECT No	W22068
DRAWN	S.N.	FIGURE No.	2
SCALE	1:1250		

3. EXISTING AND FUTURE ROAD NETWORK

3.1 Existing Road Network

The road network within the Study Area comprises Kennedy Road North from Old School Road to Bonnieglen Farm Boulevard/Newhouse Boulevard.

Kennedy Road North

Kennedy Road North is a north-south arterial road that is under the jurisdiction of the Town of Caledon. Within the vicinity of the Study Area, Kennedy Road North is a two (2) lane roadway. From Bonnieglen Farm Boulevard/Newhouse Boulevard to approximately 350 metres north of Bonnieglen Farm Boulevard/Newhouse Boulevard, Kennedy Road has a posted speed limit of 40 km/h. From approximately 350 metres north of Bonnieglen Farm Boulevard/Newhouse Boulevard to Old School Road, Kennedy Road has a posted speed limit of 60 km/h. At Bonnieglen Farm Boulevard/Newhouse Boulevard, Kennedy Road has an urban cross-section with pedestrian sidewalks provided on both sides. North of Bonnieglen Farm Boulevard/Newhouse Boulevard, Kennedy Road has a rural cross-section.

Old School Road

Old School Road is an east-west arterial road that is under the jurisdiction of the Town of Caledon. Within the vicinity of the Study Area, Old School Road is a two (2) lane roadway with an urban cross-section and a posted speed limit of 70 km/h. Pedestrian sidewalks are not provided on either side of the roadway.

Bonnieglen Farm Boulevard

Bonnieglen Farm Boulevard is a local road that is under the jurisdiction of the Town of Caledon. From Kennedy Road, the roadway extends easterly for approximately 400 metres before extending in the southeast direction for 450 metres and then in the southbound direction for approximately 1350 metres to connect with Abbotside Way. Bonnieglen Farm Boulevard connects with Kennedy Road and aligns with Newhouse Boulevard to form a roundabout intersection. Bonnieglen Farm Boulevard is a two (2) lane roadway with an urban cross-section and pedestrian sidewalks on both sides. Within the vicinity of the Study Area, the roadway has a posted speed limit of 40 km/h.

3. EXISTING AND FUTURE ROAD NETWORK (CONT'D)

3.1 Existing Road Network (Cont'd)

Newhouse Boulevard

Newhouse Boulevard is a local road that is under the jurisdiction of the Town of Caledon. From Kennedy Road, the roadway travels in the westbound direction for approximately 750 metres before travelling in the southbound direction to connect with Dougall Avenue. Newhouse Boulevard connects with Kennedy Road and aligns with Bonnieglen Farm Boulevard to form a roundabout intersection. Newhouse Boulevard is a two (2) lane roadway with an urban cross-section and pedestrian sidewalks on both sides. Within the vicinity of the Study Area, the roadway has a posted speed limit of 40 km/h.

3.2 Future Road Network

By the 2033 interim year, between Newhouse Boulevard and Old School Road, it is anticipated that Kennedy Road will be widened to four (4) lanes and urbanized[1].

By 2041, between Winston Churchill Boulevard and Airport Road, it is anticipated that Old School Road will be widened to four (4) lanes and urbanized. This Study will assume that this improvement will be completed by the 2038 horizon year.

For Kennedy Road and Old School Road, within the Study Area, the construction of multi-use paths are anticipated[2] with multi-use paths provided on both sides of Kennedy Road. It is assumed that these improvements will be constructed concurrently with the anticipated widening.

[1] Multi-Modal Transportation Master Plan, Town of Caledon and R.J. Burnside & Associates Limited, April 2024.
[2] Active Transportation Master Plan, Town of Caledon, June 2024.

3. EXISTING AND FUTURE ROAD NETWORK (CONT'D)

3.2 Future Road Network (Cont'd)

As illustrated in **Figure 2**, the proposed Residential Subdivision provides a network of local roads and collector roads (Streets 'A' and 'B'). Street 'A' and Street 'C' will align with a road provided by the proposed Developments that are owned by Argo Kennedy Limited and connect with Kennedy Road to form a four-legged intersection. Street 'B' will connect with Old School Road to form a T-intersection. In addition, Street 'I' will extend immediately south of the Subject Property to connect with Bonnieglen Farm Boulevard to form a T-intersection.

4. EXISTING TRAFFIC CONDITIONS

4.1 Existing Traffic

The Existing (2024) traffic volumes are based on the turning movement counts received from the Town of Caledon and taken by Ontario Traffic Inc. (OTI). The turning movement counts that were used in this Study are provided in **Appendix B**.

For the intersection of Old School Road at Kennedy Road, the traffic counts that were taken by OTI were conducted on Wednesday May 8, 2024 from 7:00 A.M. to 9:00 A.M. and from 4:00 P.M. to 6:00 P.M. The A.M. and P.M. Peak Hour traffic volumes for the intersection occurred between 7:30 A.M. and 8:30 A.M. and between 5:00 P.M. and 6:00 P.M., respectively.

For the intersection of Bonnieglen Farm Boulevard/Newhouse Boulevard at Kennedy Road, the traffic counts that were received from the Town of Caledon were conducted on Thursday April 20, 2023 from 7:00 A.M. to 9:00 A.M. and from 3:00 P.M. to 6:00 P.M. The A.M. and P.M. Peak Hour traffic volumes for the intersection occurred between 7:45 A.M. and 8:45 A.M. and between 3:00 P.M. and 4:00 P.M., respectively. The 2023 Peak Hour traffic counts were projected to the existing year of 2024. The growth in background traffic is summarized in Section 5.2.

For the intersection of Bonnieglen Farm Boulevard/Newhouse Boulevard at Kennedy Road, there is one (1) background development that will have site-generated trips added to the existing (2024) traffic volumes since land uses were built after the turning movement counts were taken.

4. EXISTING TRAFFIC CONDITIONS (CONT'D)

4.1 Existing Traffic (Cont'd)

A Mixed-Use Subdivision (Town File No. 21CDM-21002C and 21CDM-21003C) that is being built by Buttermill Developments Inc. is located at the southwest corner of the Dougall Avenue at Kennedy Road intersection. Between 2023 and 2024, 59 townhouse units were built and occupied. The future Mixed-Use Subdivision is being serviced by a full-moves access at Dougall Avenue and a full-moves access at Waterville Way. In addition, there are driveways that are connected with Waterville Way. Details regarding the background development's site-generated traffic volumes were taken from its Traffic Impact Study[3]. The latest Site Plan and the relevant excerpts from the Traffic Impact Study that were used in this Report are provided in **Appendix C**.

For the townhouse units that were built by the future Mixed-Use Subdivision (Buttermill Developments Inc.), trip generation formulae from the ITE Trip Generation Manual (10th Edition) for Mid-Rise Multi-Family Housing (Land Use 221) were applied for the A.M. and P.M. Peak Hours[4].

Table 1 summarizes the trip generation formulae along with the percentages of incoming and outgoing trips for the A.M. and P.M. Peak Hours.

Table 1: Future Mixed-Use Subdivision (Buttermill Developments Inc.) (Existing Land Uses) - Trip Generation Formulae and Rates with Inbound and Outbound Percentages

ITE Land Use	A.M. Peak Hour			P.M. Peak Hour		
	Trip Rate/ Fitted Curve Equation	% In	% Out	Trip Rate/ Fitted Curve Equation	% In	% Out
Multifamily Housing (Mid-Rise) (LU 221)	Ln (T) = 0.98Ln(X) – 0.98 (Note 1)	26%	74%	Ln (T) = 0.96Ln(X) - 0.63 (Note 1)	61%	39%

Note 1: T represents the total number of trips and X represents the total number of dwelling units.

[3] Proposed Development at Dougall Avenue and Kennedy Road, Caledon, WSP, October 18 2019.
[4] Trip Generation Manual, 10th Edition, Institute of Transportation Engineers, 2017.

4. EXISTING TRAFFIC CONDITIONS (CONT'D)

4.1 Existing Traffic (Cont'd)

The resulting number of trips generated was determined by the trip generation formulae provided in **Table 1** and the number of dwelling units. Between 2023 and 2024, 59 townhouse units were built and occupied.

The resulting number of trips generated is provided in **Table 2** for the A.M. and P.M. Peak Hours of adjacent street traffic.

Table 2: Future Mixed-Use Subdivision (Buttermill Developments Inc.) (Existing Land Uses) - Site-Generated Trips

ITE Land Use	Quantity	A.M. Peak Hour			P.M. Peak Hour		
		Trips In	Trips Out	Total	Trips In	Trips Out	Total
Multifamily Housing (Mid-Rise) (LU 221)	59 units	5	15	**20**	16	11	**27**

The residential land uses are assumed to generate a total of 20 trips during the A.M. Peak Hour (5 inbound trips and 15 outbound trips) and 27 trips during the P.M. Peak Hour (16 inbound trips and 11 outbound trips).

The Traffic Impact Study for the anticipated background development determined the trip assignment by using the results of the 2016 Transportation Tomorrow Survey.

4. EXISTING TRAFFIC CONDITIONS (CONT'D)

4.1 Existing Traffic (Cont'd)

The assumed trip distribution and assignment for the anticipated background development will be as follows:

A.M. Peak Hour

- 2% (2%) to/from the north via Kennedy Road,
- 6% (6%) to/from the east via Dougall Avenue or Waterville Way,
- 87% (87%) to/from the south via Kennedy Road,
- 6% (6%) to/from the west via Dougall Avenue or Waterville Way.

P.M. Peak Hour

- 2% from the north via Kennedy Road,
- 5% from the east via Dougall Avenue or Waterville Way,
- 88% from the south via Kennedy Road,
- 6% from the west via Dougall Avenue or Waterville Way.

100% Inbound

- 3% to the north via Kennedy Road,
- 4% to the east via Dougall Avenue or Waterville Way,
- 87% to the south via Kennedy Road,
- 6% to the west via Dougall Avenue or Waterville Way.

100% Outbound

During the A.M. and P.M. Peak Hours, it was assumed that there are no trips using the concerned intersections for this Study.

4. EXISTING TRAFFIC CONDITIONS (CONT'D)

4.2 Existing Transit

Within the vicinity of the proposed Residential Subdivision, a transit stop at the northeast corner of the Learmont Avenue/Dotchson Avenue at Kennedy Road intersection services the Brampton 81 Transit Route (Mayfield West) for the northbound direction.

4.3 Existing Traffic Analysis

The Existing (2024) peak hour traffic volumes are provided in **Figures 3 and 4**. For the Existing (2024) Traffic Volumes, the Level of Service (LOS) was analyzed using SYNCHRO 9.0 software[5].

The intersection of Old School Road at Kennedy Road was analyzed as a semi-actuated uncoordinated signalized intersection with Kennedy Road as the main street. The lane configuration used in the analysis comprises a shared left-through-right turning lane at all approaches. The signal timing plans were received from the Region of Peel and are included in **Appendix D**.

The intersection of Bonnieglen Farm Boulevard/Newhouse Boulevard at Kennedy Road was analyzed as a single-lane roundabout that is yield-controlled at all of the approaches. The lane configuration used in the analysis comprises a shared left-through-right turning lane at all approaches.

The results of the analysis are summarized in **Table 3**. The related calculations are provided in **Appendix F**. The LOS definitions for signalized and un-signalized (applies for roundabout intersections) intersections are included in **Appendix E** for reference.

[5] Synchro 9 Traffic Signal Optimization and Simulation Modeling Software, Version 9, Trafficware Corporation, 2014.

Existing (2024) Traffic Volumes - A.M. Peak Hour

W22068
Proposed Residential Subdivision
Town of Caledon
Trends Development Inc.

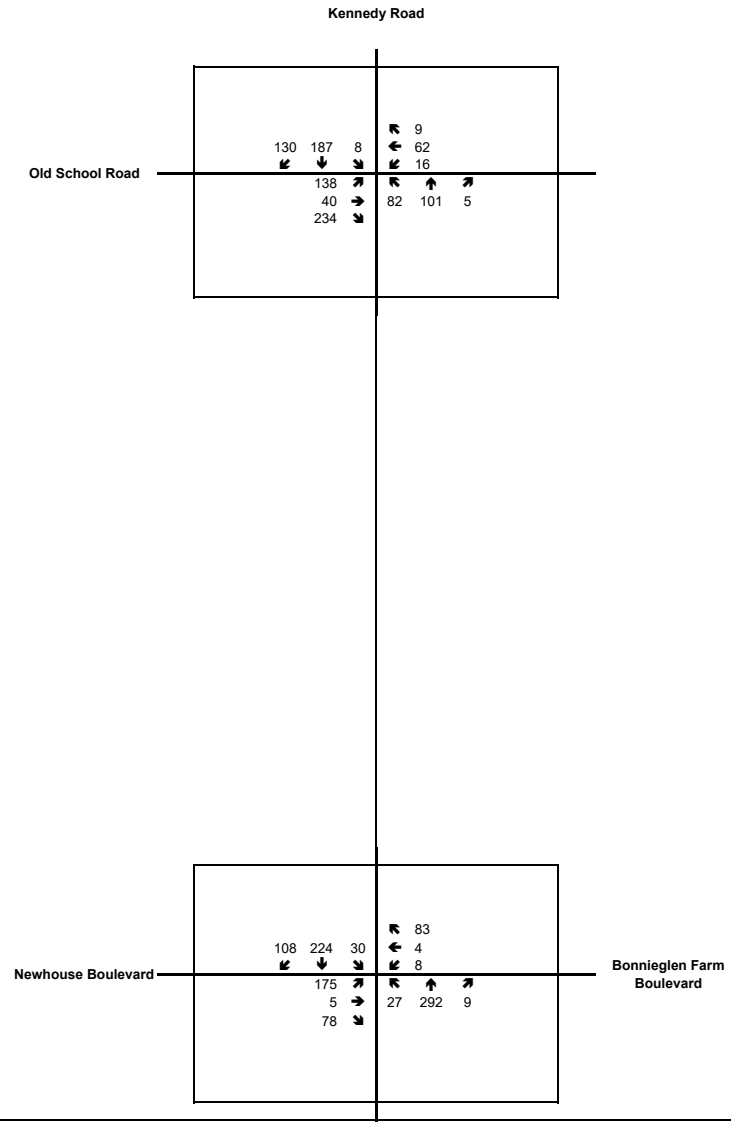

Figure No: 3

Date: May 16 2024

Prepared by: B.W.

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Existing (2024) Traffic Volumes - P.M. Peak Hour

W22068
Proposed Residential Subdivision
Town of Caledon
Trends Development Inc.

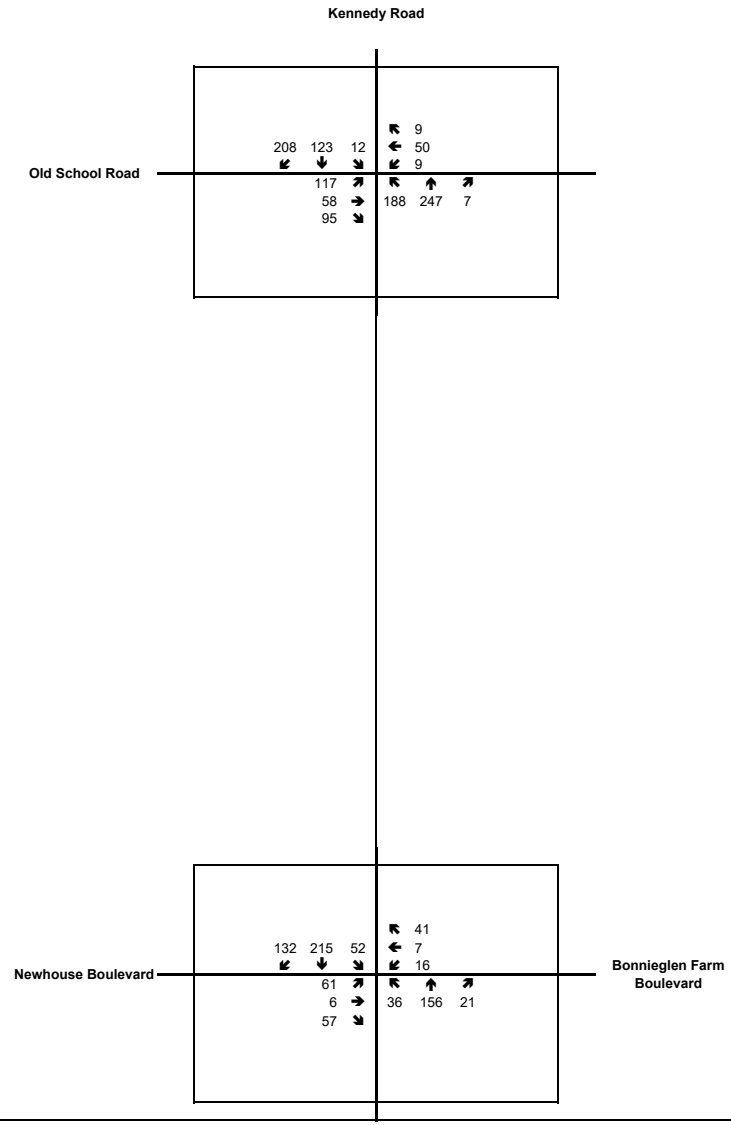

Figure No: 4

Date: May 16 2024

Prepared by: B.W.

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4. EXISTING TRAFFIC CONDITIONS (CONT'D)

4.3 Existing Traffic Analysis (Cont'd)

Table 3: Existing (2024) Traffic – Level of Service

Intersection	Turning Movement/ Approach	A.M. Peak Hour				P.M. Peak Hour			
		V/C	LOS	Delay[1]	95% Queue (m)	V/C	LOS	Delay[1]	95% Queue (m)
Old School Road at Kennedy Road (Signalized)	**Overall**	**0.77**	**B**	**15.7**	**n/a**	**0.72**	**B**	**15.7**	**n/a**
	EB Approach	0.77	C	21.3	50.8	0.72	C	31.4	51.2
	WB Approach	0.18	B	12.3	13.2	0.16	B	18.4	14.9
	NB Approach	0.30	B	12.8	31.0	0.55	B	13.2	74.1
	SB Approach	0.39	B	11.3	44.5	0.33	A	6.1	32.3
Bonnieglen Farm Boulevard/ Newhouse Boulevard at Kennedy Road (Roundabout)	**Overall**	**0.37**	**A**	**7.6**	**n/a**	**0.39**	**A**	**7.1**	**n/a**
	EB Approach	0.31	A	7.8	8.0	0.16	A	6.5	8.0
	WB Approach	0.14	A	6.8	0.0	0.08	A	5.4	0.0
	NB Approach	0.37	A	8.3	16.0	0.24	A	6.7	8.0
	SB Approach	0.35	A	7.1	16.0	0.39	A	7.8	16.0

Note 1: Delays are measured in seconds per vehicle.

4. EXISTING TRAFFIC CONDITIONS (CONT'D)

4.3 Existing Traffic Analysis (Cont'd)

Old School Road at Kennedy Road

The analysis of the Existing (2024) Traffic Conditions indicates that the signalized intersection operates at a Level of Service "B" during the A.M. and P.M. Peak Hours.

All of the turning movements operate at a Level of Service "C" or better during the A.M. and P.M. Peak Hours.

Bonnieglen Farm Boulevard/Newhouse Boulevard at Kennedy Road

The analysis of the Existing (2024) Traffic Conditions indicates that the roundabout operates at a Level of Service "A" during the A.M. and P.M. Peak Hours.

During the A.M. and P.M. Peak Hours, all of the turning movements operate at a Level of Service "A" with an average delay of 8.3 seconds per vehicle or better.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS

5.1 Other Background Traffic

This Traffic Impact Study will consider four (4) anticipated background developments within the vicinity of the Subject Development[6]. The location of the anticipated background developments are illustrated in **Figure 5**.

Future Mixed-Use Subdivision (Buttermill Developments Inc.)

A Mixed-Use Subdivision (Town File No. 21CDM-21002C and 21CDM-21003C) owned by Buttermill Developments Inc. is located at the southwest corner of the Dougall Avenue at Kennedy Road North intersection. The Mixed-Use Subdivision will be fully built-out by the 2033 interim year resulting in the construction and occupancy of 52 dwelling units and 13,897 ft^2 of commercial land use. The future Mixed-Use Subdivision is being serviced by a full-moves access at Dougall Avenue and a full-moves access at Waterville Way. In addition, there are driveways that are connected with Waterville Way. Details regarding the background development's site-generated traffic volumes were taken from its Traffic Impact Study. The latest Site Plan and the relevant excerpts from the Traffic Impact Study that were used in this Report are provided in **Appendix C**.

Proposed Mixed-Use Redevelopment (English Prestige Construction Management)

A Mixed-Use Redevelopment (Town File No. SPA 2022-0006) proposed by English Prestige Construction Management is located immediately west of Kennedy Road North and north of Dougall Avenue. Currently, the Subject Development comprises three (3) buildings with a total of 19 commercial units, an existing full-moves access at Kennedy Road North and two (2) existing full-moves accesses at Dougall Avenue. The proposed Mixed-Use Redevelopment will add 158 apartment units and 9,322 ft^2 of commercial land use. In addition, an access at Dougall Avenue will be repurposed to an access for pedestrians. Details regarding the background development's site-generated traffic volumes were taken from its Traffic Impact Study[7]. The relevant excerpts from the Traffic Impact Study that were used in this Report are provided in **Appendix C**.

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[6] Current Development Applications, Town of Caledon, Site Visited on May 17 2024. https://caledon.maps.arcgis.com/apps/instant/sidebar/index.html?appid=64ee4b915f0a4e1cacb6cff4f2a099f5

[7] Traffic Impact Study for Proposed Mixed-Use Re-development, Candevcon Group Inc., Updated August 18th,2023

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.1 Other Background Traffic (Cont'd)

Future Residential Developments (Digram/Yeoman/Moscorp VII)

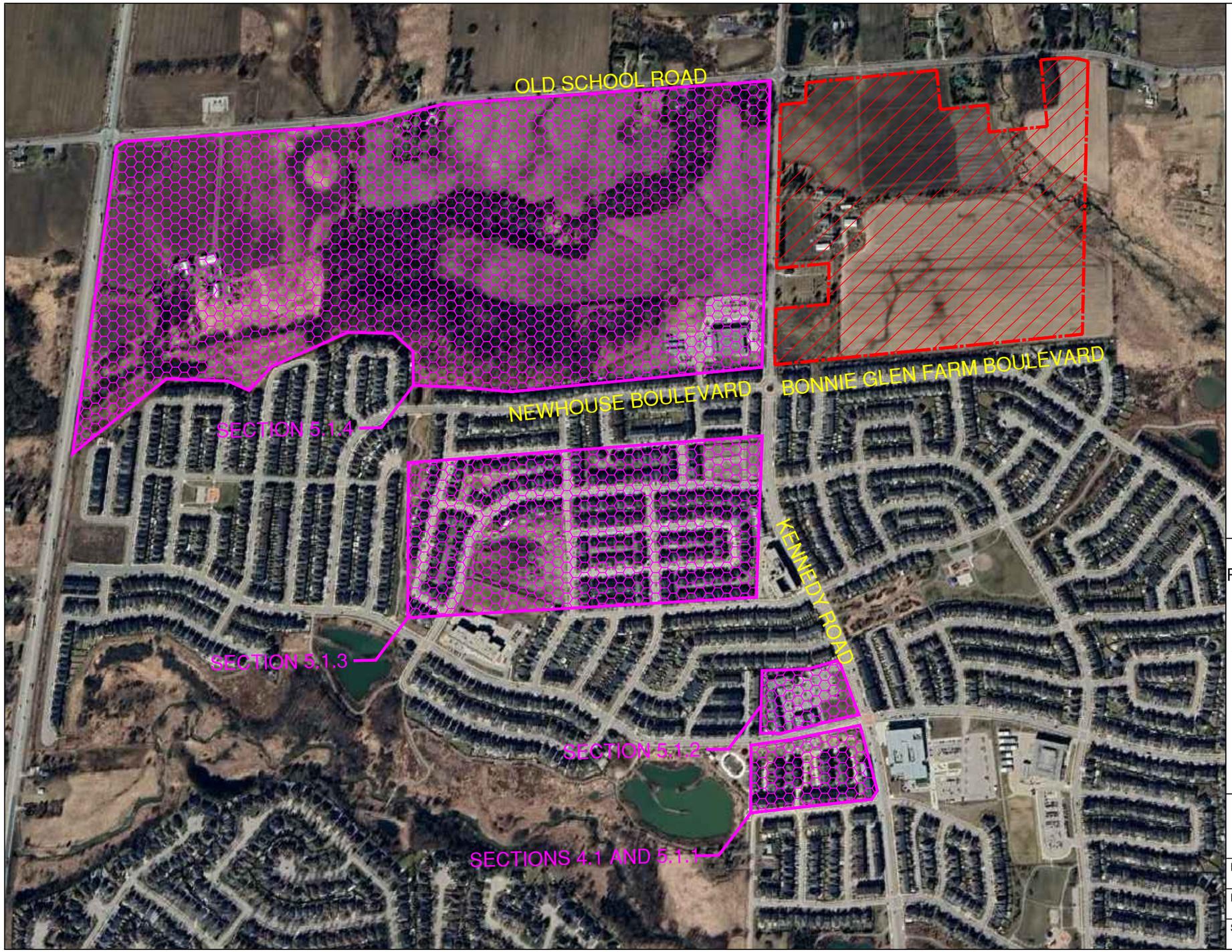
By the 2033 interim year, approximately 5 single detached homes and 32 townhouse units will be built and occupied by the residential developments owned by Digram/Yeoman/Moscorp VII. The residential land uses will have non-restrictive access to Kennedy Road North. To determine the trip assignment of the future residential land uses, the Traffic Impact Study for the Southfields Community Centre[8] was used. The relevant excerpts from the background study that were used in this Report are provided in **Appendix C**.

Proposed Developments (Newhouse and Argo Kennedy Limited)

The proposed Developments comprises 491 single detached homes, 409 townhouse units and 171 mid-rise apartment units. The lands are bounded by Old School Road to the north, Kennedy Road to the east and Hurontario Street to the west. Due to the configuration of the natural heritage system, the proposed Developments are separated into three (3) zones with connections with Old School Road and Kennedy Road. A collector road from the background developments will align with Street 'A' and connect with Kennedy Road to form a four-legged intersection. A local road from the background developments will align with Street 'C' and connect with Kennedy Road to form a four-legged intersection. This Study will use the information provided in the Transportation Considerations Report for the lands that include this anticipated background development and the Subject Subdivision.[9] The relevant excerpts from the background study that were used in this Report are provided in **Appendix C**.

[8] Southfields Community Centre - Town of Caledon, JD Northcote Engineering Inc., September 28, 2017.

[9] Mayfield West Phase 1 – Stage 2 Local Official Plan Amendment – UPDATED Transportation Considerations Report, BA Group, August 2023.



LEGEND:

SUBJECT SITE

ANTICIPATED BACKGROUND DEVELOPMENT

TRENDS DEVELOPMENT INC.
PROPOSED RESIDENTIAL SUBDIVISION

LOCATION OF ANTICIPATED BACKGROUND DEVELOPMENTS

12909 KENNEDY ROAD
PART OF LOT 22, CONCESSION 2
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL

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TEL. (905) 794-0600 FAX (905) 794-0611

DATE MAY 17th 2024	PROJECT No W22068
DRAWN B.W.	FIGURE No. 5
SCALE N.T.S	

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.1.1 Future Mixed-Use Subdivision (Buttermill Developments Inc.)

Trip generation formulae and rates from the ITE Trip Generation Manual (10th Edition) for Mid-Rise Multi-Family Housing (Land Use 221) and Retail Land Use (Land Use 820) were applied for the A.M. and P.M. Peak Hours.

Table 4 summarizes the trip generation formulae and rates along with the percentages of incoming and outgoing trips for the A.M. and P.M. Peak Hours.

Table 4: Future Mixed-Use Subdivision (Buttermill Developments Inc.) (Future Land Uses) - Trip Generation Formulae and Rates with Inbound and Outbound Percentages

ITE Land Use	A.M. Peak Hour			P.M. Peak Hour		
	Trip Rate/ Fitted Curve Equation	% In	% Out	Trip Rate/ Fitted Curve Equation	% In	% Out
Multifamily Housing (Mid-Rise) (LU 221)	Ln (T) = 0.98Ln(X) – 0.98 (Note 1)	26%	74%	Ln (T) = 0.96Ln(X) - 0.63 (Note 1)	61%	39%
Shopping Centre (LU 820)	0.94 (Note 2)	62%	38%	3.81 (Note 2)	48%	52%

Note 1: T represents the total number of trips and X represents the total number of dwelling units.
Note 2: Trip rate is per every 1,000 ft^2 of G.L.A.

The resulting number of trips generated was determined by the trip generation formulae and rates provided in **Table 4** and the future land uses. The future Mixed-Use Subdivision will build 52 dwelling units and 13,897 ft^2 of commercial land use.

The resulting number of trips generated is provided in **Table 5** for the A.M. and P.M. Peak Hours of adjacent street traffic.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.1.1 Future Mixed-Use Subdivision (Buttermill Developments Inc.) (Cont'd)

Table 5: Future Mixed-Use Subdivision (Buttermill Developments Inc.) (Future Land Uses) - Site-Generated Trips

ITE Land Use	Quantity	A.M. Peak Hour			P.M. Peak Hour		
		Trips In	Trips Out	Total	Trips In	Trips Out	Total
Multifamily Housing (Mid-Rise) (LU 221)	52 units	5	13	18	15	9	24
Shopping Centre (LU 820)	13,897 ft^2 G.L.A.	8	5	13	25	28	53
TOTAL	-	13	18	**31**	40	37	**77**

The future land uses are expected to generate a total of 31 trips during the A.M. Peak Hour (13 inbound trips and 18 outbound trips) and 77 trips during the P.M. Peak Hour (40 inbound trips and 37 outbound trips).

To determine the trip assignment for the future land uses, results from the 2016 Transportation Tomorrow Survey were used.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.1.1 Future Mixed-Use Subdivision (Buttermill Developments Inc.) (Cont'd)

The assumed trip distribution and assignment will be as follows:

A.M. Peak Hour

- 2% (2%) to/from the north via Kennedy Road,
- 6% (6%) to/from the east via Dougall Avenue or Waterville Way,
- 87% (87%) to/from the south via Kennedy Road,
- 6% (6%) to/from the west via Dougall Avenue or Waterville Way.

P.M. Peak Hour

- 2% from the north via Kennedy Road,
- 5% from the east via Dougall Avenue or Waterville Way,
- 88% from the south via Kennedy Road,
- 6% from the west via Dougall Avenue or Waterville Way.

100% Inbound

- 3% to the north via Kennedy Road,
- 4% to the east via Dougall Avenue or Waterville Way,
- 87% to the south via Kennedy Road,
- 6% to the west via Dougall Avenue or Waterville Way.

100% Outbound

After reviewing the resulting number of site-generated trips in **Table 5** and the trip assignment shown above, it was determined that the number of site-generated trips using the concerned intersections for this Study will be negligible.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.1.2 Proposed Mixed-Use Redevelopment (English Prestige Construction Management)

For the proposed apartment units (Land Use 231) and the proposed retail land use (Land Use 820), the trip generation rates and formulae from the ITE Trip Generation Manual 10th Edition were applied for the A.M. and P.M. Peak Hours. For the retail land use, the worst-case between the trip generation rate and the trip generation formula was applied for each scenario.

Table 6 summarizes the trip generation rates and formulae along with the percentages of incoming and outgoing trips for the A.M. and P.M. Peak Hours.

Table 6: Proposed Mixed-Use Redevelopment (English Prestige Construction Management) - Trip Generation Rates and Formulae with Inbound and Outbound Percentages

ITE Land Use	A.M. Peak Hour			P.M. Peak Hour		
	Trip Rate/ Fitted Curve Equation	% In	% Out	Trip Rate/ Fitted Curve Equation	% In	% Out
Mid-Rise Residential with 1st-Floor Commercial (LU 231)	0.30 (Note 1)	28%	72%	0.36 (Note 1)	70%	30%
Shopping Centre (LU 820)	T= 0.50X + 151.78 (Note 2)	62%	38%	Ln(T) = 0.74Ln(X) + 2.89 (Note 2)	48%	52%

Note 1: The trip rate is per dwelling unit.
Note 2: T represents the total number of trips and X represents every 1,000 square feet of G.L.A.

For the proposed apartment units, the resulting number of trips generated was determined by using the trip generation rates provided in **Table 6** and the number of units. 158 apartment units are proposed as a part of the Mixed-Use Redevelopment.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.1.2 Proposed Mixed-Use Redevelopment (English Prestige Construction Management) (Cont'd)

For the proposed commercial land uses, the resulting number of trips generated was determined by the trip generation formulae provided in **Table 6** and the G.L.A. Eleven (11) commercial units with a total G.L.A. of 9,322 ft^2 are proposed. This Study applied a pass-by percentage of 34% for the P.M. Peak Hour. The pass-by trip percentage was based on the data provided in the ITE Trip Generation Handbook 3rd Edition.[10]

The resulting number of trips generated is provided in **Table 7** for the A.M. and P.M. Peak Hours of adjacent street traffic.

Table 7: Proposed Mixed-Use Redevelopment (English Prestige Construction Management) - Site-Generated Trips

Land Use	Quantity	Trips	A.M. Peak Hour (Adj. Street)			P.M. Peak Hour (Adj. Street)		
			Trips In	Trips Out	Total	Trips In	Trips Out	Total
Mid-Rise Residential with 1st-Floor Commercial	158 Dwelling units	Gross Trips	13	34	47	40	17	57
Shopping Centre	9,322 ft^2	Gross Trips	97	59	156	45	49	94
		Pass-by Trips	0	0	0	15	15	30
Total	-	Gross Trips	110	93	**203**	85	66	**151**
		Pass-by Trips	0	0	0	15	15	30

The proposed Mixed-Use Redevelopment is expected to generate a total of 203 net trips during the A.M. Peak Hour (110 inbound trips and 93 outbound trips) and 151 trips during the P.M. Peak Hour (85 inbound trips and 66 outbound trips).

[10] Trip Generation Handbook (3rd Edition), Institute of Transportation Engineers, September 2017.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.1.2 Proposed Mixed-Use Redevelopment (English Prestige Construction Management) (Cont'd)

For the residential land use, based on the nature of the land use, the majority of the trips generated will not be local traffic. Therefore, the A.M. Peak Period work trip distribution from the 2016 Transportation Tomorrow Survey and the future road network were utilized for the assumed trip distribution and trip assignment. The Traffic Impact Study for this anticipated background development did not provide site-generated volumes for the concerned intersections of this Study. As a result, this Study determined the site-generated volumes for the concerned intersections using the same methodology.

The assumed trip distribution and assignment will be as follows:

- 6% (6%) to/from the north via Kennedy Road,
- 3% (3%) to/from the east via Old School Road,
- 88% (88%) to/from the south via Kennedy Road,
- 3% (3%) to/from the west via Old School Road.

For the commercial land use, based on the nature of the land use, the trip distribution and assignment is based on the future residential land use within the vicinity of proposed Mixed-Use Redevelopment.

The assumed trip distribution and assignment will be as follows:

- 35% (35%) to/from the north via Kennedy Road,
- 15% (15%) to/from the east via Dougall Avenue,
- 20% (20%) to/from the south via Kennedy Road,
- 30% (30%) to/from the west via Dougall Avenue.

The site-generated trip volumes and trip assignment used in the analysis for the proposed Mixed-Use Redevelopment are illustrated in **Figures 6 and 7**.

Trip Assignment for the
Proposed Mixed-Use Redevelopment (English Prestige Construction Management)
A.M. Peak Hour

W22068
Proposed Residential Subdivision
Town of Caledon
Trends Development Inc.

Note: The location of the anticipated background development is shaded in grey.

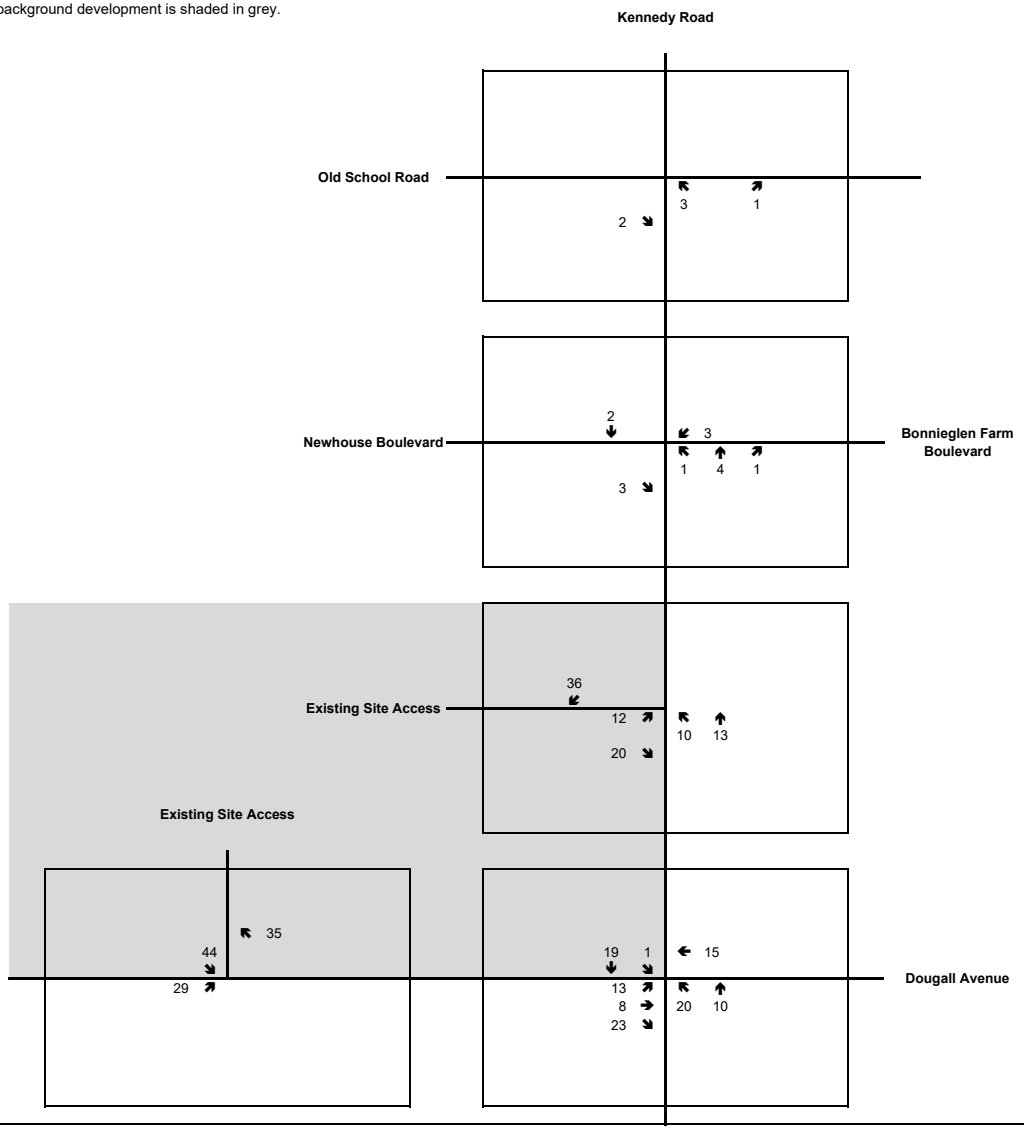

Figure No: 6

Date: May 14 2024

Prepared by: B.W.

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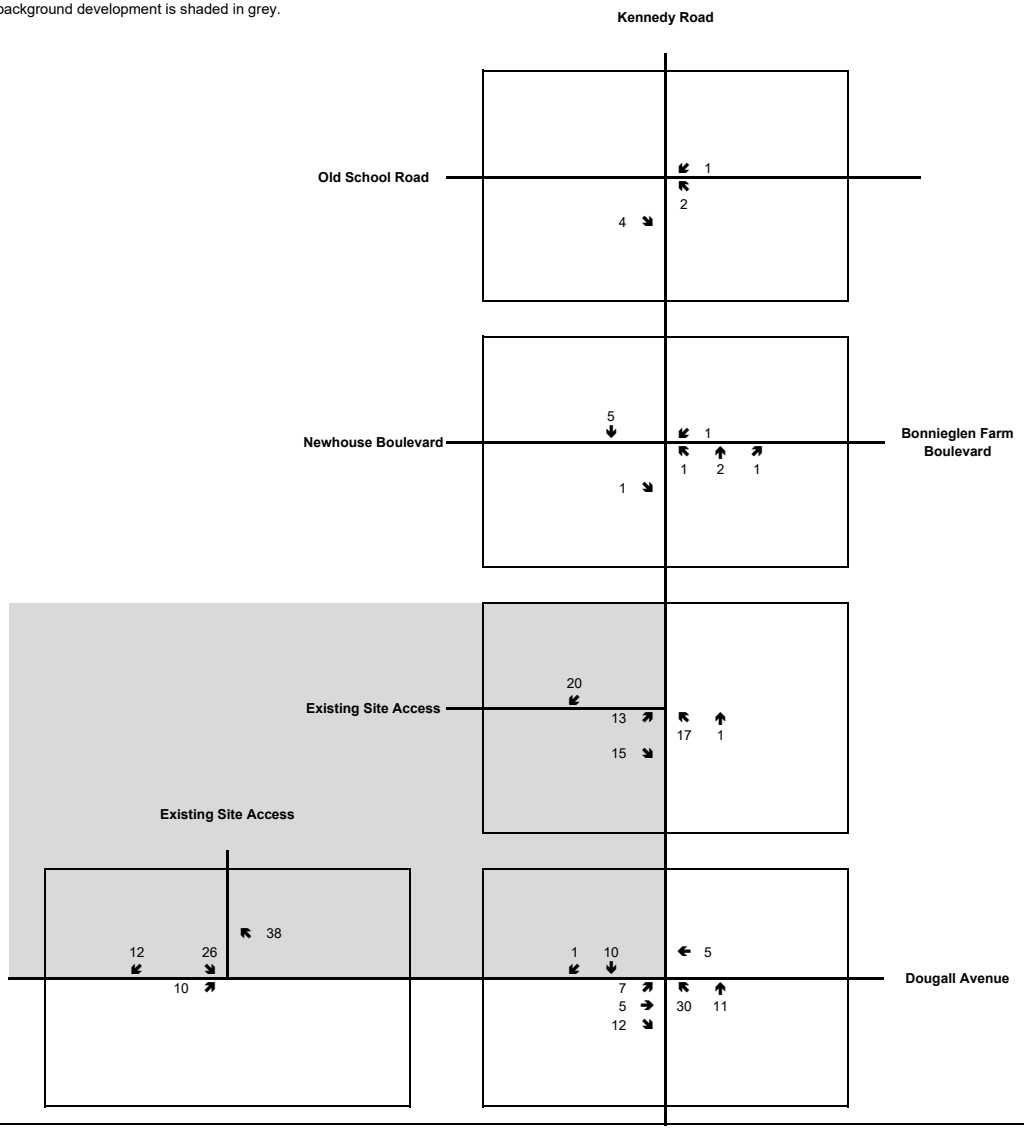
Trip Assignment for the Proposed Mixed-Use Redevelopment (English Prestige Construction Management) P.M. Peak Hour	W22068 Proposed Residential Subdivision Town of Caledon Trends Development Inc.

Note: The location of the anticipated background development is shaded in grey.



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Prepared by: B.W.

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5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.1.3 Future Residential Developments (Digram/Yeoman/Moscorp VII)

For the single detached homes (Land Use 210) and the townhouse units (Land Use 230), the trip generation formulae from the ITE Trip Generation Manual 9th Edition were applied for the A.M. and P.M. Peak Hours[11].

Table 8 summarizes the trip generation formulae along with the percentages of incoming and outgoing trips during the A.M. and P.M. Peak Hours.

Table 8: Future Residential Developments (Digram/Yeoman/Moscorp VII) -Trip Generation Formulae with Inbound and Outbound Percentages

ITE Land Use	A.M. Peak Hour			P.M. Peak Hour		
	Fitted Curve Equation	% In	% Out	Fitted Curve Equation	% In	% Out
Single-Family Detached Housing (LU 210)	T = 0.70(X) + 9.74	25%	75%	Ln (T) = 0.90Ln(X) + 0.51	63%	37%
Residential Condominium/ Townhouse (LU 230)	Ln (T) = 0.78Ln(X) – 0.09	16%	84%	Ln (T) = 0.81Ln(X) + 0.03	66%	34%

Note: T represents the total number of trips and X represents the total number of dwelling units.

The resulting number of trips generated is based on the trip generation formulae provided in **Table 8** and the number of dwelling units. The future Residential Developments will build 5 single detached homes and 32 townhouse units.

The resulting number of trips generated is provided in **Table 9** for the A.M. and P.M. Peak Hours.

[11] ITE. 2012. Trip Generation Manual (9th Edition). Institute of Transportation Engineers, Virginia, Maryland.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.1.3 Future Residential Developments (Digram/Yeoman/Moscorp VII) (Cont'd)

Table 9: Future Residential Developments (Digram/Yeoman/Moscorp VII) – Site Generated Trips

Land Use	No. of Units	A.M. Peak Hour			P.M. Peak Hour		
		Trips In	Trips Out	Total	Trips In	Trips Out	Total
Single-Family Detached Housing (LU 210)	5	3	10	**13**	4	3	**7**
Residential Condominium/ Townhouse (LU 230)	32	2	12	**14**	11	6	**17**
TOTAL	37	5	22	**27**	15	9	**24**

The future Residential Developments are assumed to generate a total of 27 additional trips during the A.M. Peak Hour (5 inbound trips and 22 outbound trips) and 24 trips during the P.M. Peak Hour (15 inbound trips and 9 outbound trips).

Based on the nature of the land use, the majority of the trips generated will not be local traffic. Therefore, the A.M. Peak Period work trip distribution from the 2016 Transportation Tomorrow Survey and the future road network were utilized for the assumed trip distribution and trip assignment.

The assumed trip distribution and assignment will be as follows:

- 6% (6%) to/from the north via Kennedy Road,
- 3% (3%) to/from the east via Old School Road,
- 88% (88%) to/from the south via Kennedy Road,
- 3% (3%) to/from the west via Old School Road.

The site-generated trip volumes and trip assignment used in the analysis for the future Residential Development are illustrated in **Figures 8 and 9**.

Trip Assignment for the Future Residential Developments (Digram/Yeoman/Moscorp VII) A.M. Peak Hour	W22068 Proposed Residential Subdivision Town of Caledon Trends Development Inc.

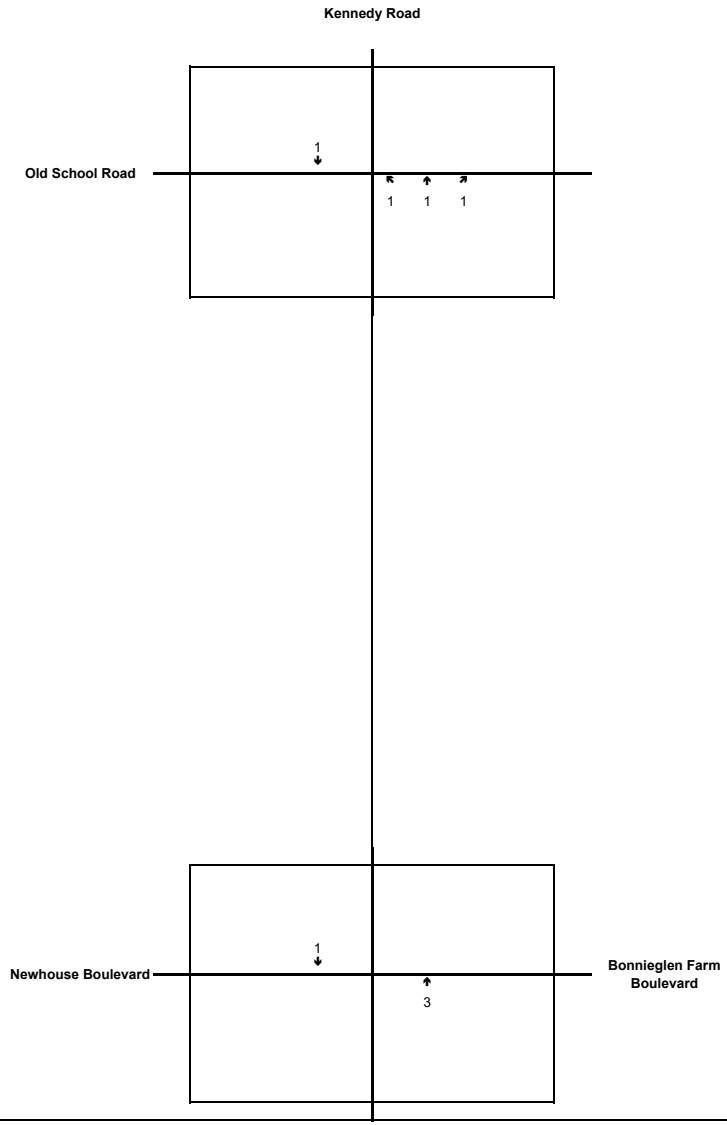

Figure No:	8
Date:	June 14 2024
Prepared by:	B.W.

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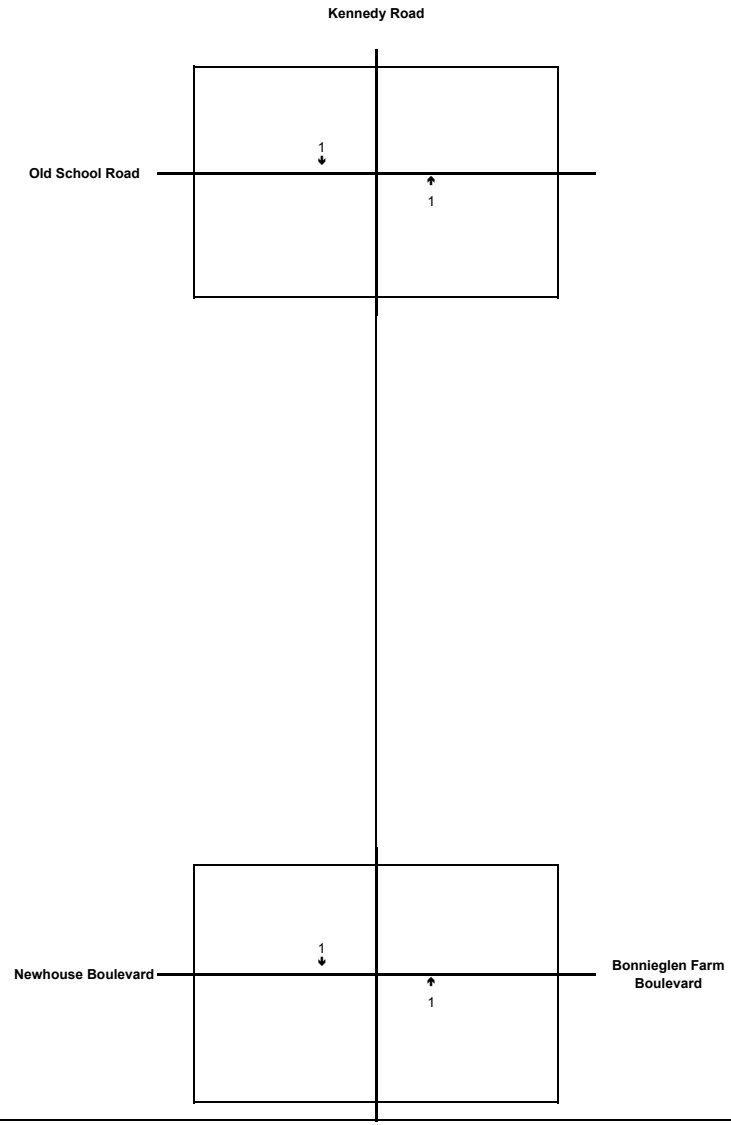
Trip Assignment for the Future Residential Developments (Digram/Yeoman/Moscorp VII) P.M. Peak Hour	W22068 Proposed Residential Subdivision Town of Caledon Trends Development Inc.



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Date: June 14 2024

Prepared by: B.W.

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5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.1.4 Proposed Developments (Newhouse and Argo Kennedy Limited)

For the single detached homes (Land Use 210), the townhouse units (Land Use 220) and the mid-rise apartments (Land Use 221), the trip generation rates from the ITE Trip Generation Manual 11th Edition were applied for the A.M. and P.M. Peak Hours[12].

Table 10 summarizes the trip generation rates along with the percentages of incoming and outgoing trips for the A.M. and P.M. Peak Hours.

Table 10: Proposed Developments (Newhouse and Argo Kennedy Limited) - Trip Generation Rates with Inbound and Outbound Percentages

ITE Land Use	A.M. Peak Hour			P.M. Peak Hour		
	Trip Rate[1]	% In	% Out	Trip Rate[1]	% In	% Out
Single-Family Detached Housing (LU 210)	0.70	26%	74%	0.94	63%	37%
Multifamily Housing (Low-Rise) (LU 220)	0.40	24%	76%	0.51	63%	37%
Multifamily Housing (Mid-Rise) (LU 221)	0.37	23%	77%	0.39	61%	39%

Note 1: The trip rate is per dwelling unit.

The resulting number of trips generated was determined by using the trip generation rates provided in **Table 10** and the number of dwelling units. The proposed Developments comprises 491 single detached homes, 409 townhouse units and 171 mid-rise apartment units.

The resulting number of trips generated is provided in **Table 11** for the A.M. and P.M. Peak Hours.

[12] Trip Generation Manual (11th Edition), Institute of Transportation Engineers, September 2021.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.1.4 Proposed Developments (Newhouse and Argo Kennedy Limited) (Cont'd)

Table 11: Proposed Developments (Newhouse and Argo Kennedy Limited) - Site-Generated Trips

Land Use	No. of Dwelling Units	A.M. Peak Hour (Adj. Street)			P.M. Peak Hour (Adj. Street)		
		Trips In	Trips Out	Total	Trips In	Trips Out	Total
Single-Family Detached Housing	491	70	200	270	235	135	370
Multifamily Housing (Low-Rise)	409	45	155	200	160	95	255
Multifamily Housing (Mid-Rise)	171	15	50	65	40	25	65
Total	1,071	130	405	**535**	435	255	**690**

The proposed Developments are expected to generate a total of 535 trips during the A.M. Peak Hour (130 inbound trips and 405 outbound trips) and 690 trips during the P.M. Peak Hour (435 inbound trips and 255 outbound trips).

For the trip assignment of the proposed land uses, the results from the 2016 Transportation Tomorrow Survey were considered.

Under the assumption that the Highway 413 freeway will be constructed, the trip assignment used in the analysis is as follows:

- 21% from the north via Hurontario Street,
- 17% from the east via Old School Road,
- 57% from the south via Hurontario Street, Kennedy Road or Heartlake Road,
- 5% from the west via Old School Road.

Total 100% Inbound

- 20% to the north via Hurontario Street,
- 21% to the east via Old School Road,
- 55% to the south via Hurontario Street, Kennedy Road or Heartlake Road,
- 4% to the west via Old School Road.

Total 100% Outbound

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

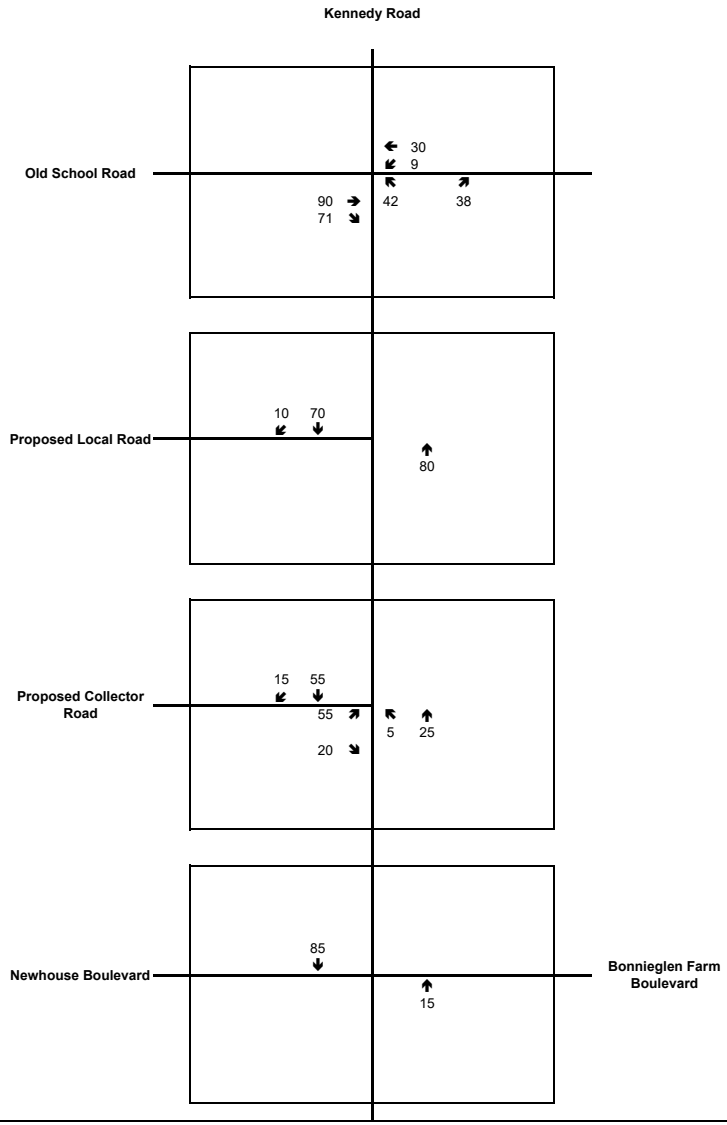
5.1.4 Proposed Developments (Newhouse and Argo Kennedy Limited) (Cont'd)

The site-generated trip volumes and trip assignment used in the analysis for the proposed Development are illustrated in **Figures 10 and 11**.

Since the site-generated traffic volumes in the Transportation Considerations Report includes the site-generated trips from the Subject Subdivision, site-generated traffic volumes for the background developments were determined by CANDEVCON GROUP INC. using the trip distribution and the trip assignment provided in the Transportation Considerations Report.

Trip Assignment of Proposed Developments (Newhouse and Argo Kennedy Limited)
A.M. Peak Hour

W22068
Proposed Residential Subdivision
Town of Caledon
Trends Development Inc.



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Date: June 6 2024

Prepared by: B.W.

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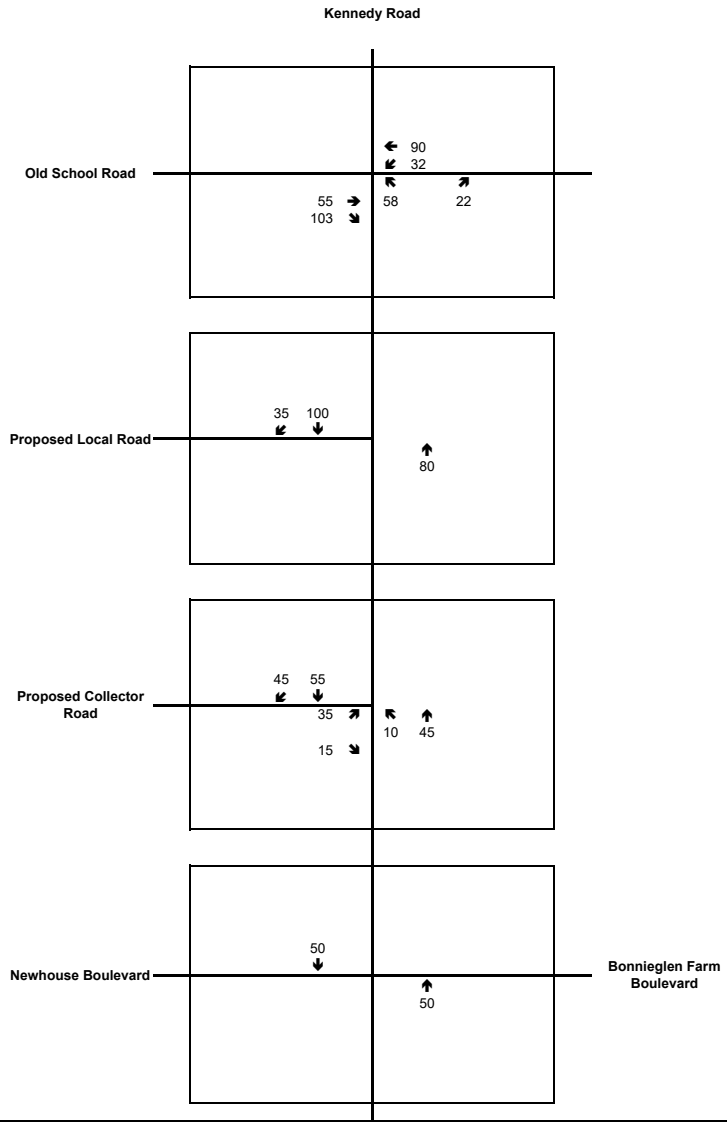
Trip Assignment of Proposed Developments (Newhouse and Argo Kennedy Limited)
P.M. Peak Hour

W22068
Proposed Residential Subdivision
Town of Caledon
Trends Development Inc.



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Date: June 6 2024

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5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.2 Traffic Growth Rate

The assumed growth rate for Kennedy Road and Old School Road was provided by the Town of Caledon. This Study assumed an annual growth rate of 2%.

For the Old School Road at Kennedy Road intersection, growth was applied to the through movements and the turning movements entering the roadway. For the Bonnieglen Farm Boulevard/Newhouse Boulevard at Kennedy Road intersection, growth on Kennedy Road was applied to the through movements.

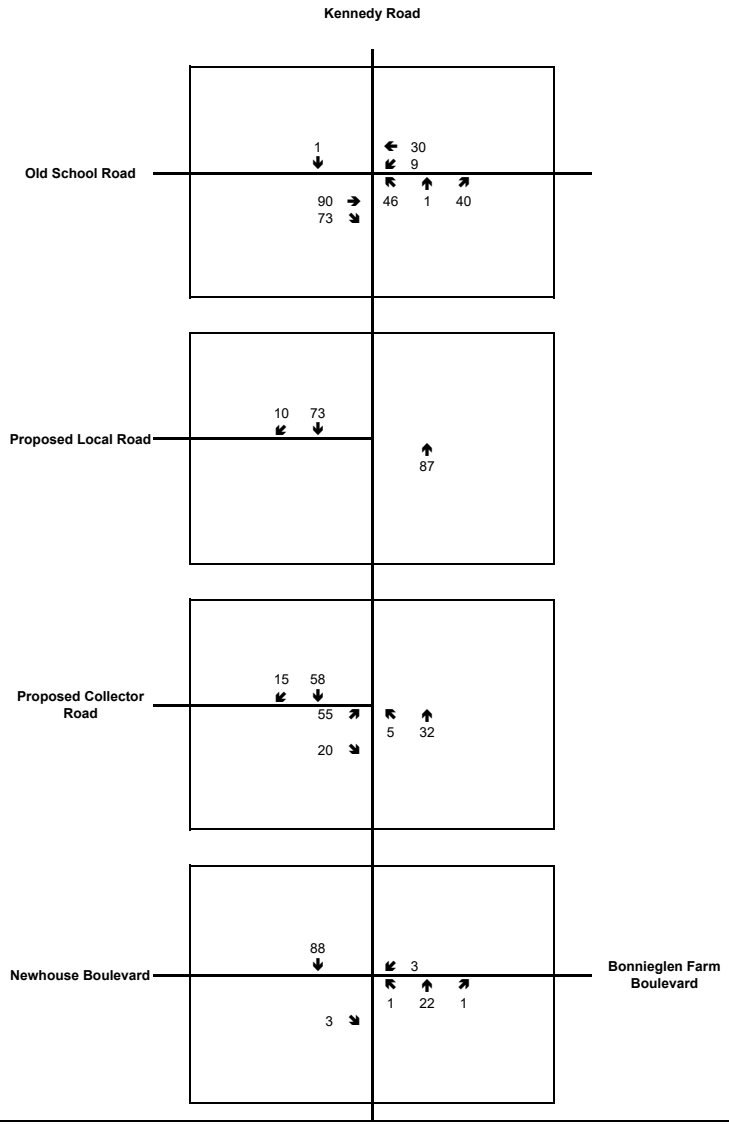
5.3 Future (2033) Total Background Traffic

The Future (2033) Total Background Traffic is based on the Existing (2024) Traffic volumes projected with nine (9) years of background growth plus the site-generated trips from the anticipated background developments, which is provided in **Figures 12 and 13**.

The Future (2033) Total Background Traffic Volumes are illustrated in **Figures 14 and 15** for the A.M. and P.M. Peak Hours.

Trip Assignment of Anticipated Background Developments
A.M. Peak Hour

W22068
Proposed Residential Subdivision
Town of Caledon
Trends Development Inc.



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Date: June 6 2024

Prepared by: B.W.

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Trip Assignment of Anticipated Background Developments
P.M. Peak Hour

W22068
Proposed Residential Subdivision
Town of Caledon
Trends Development Inc.

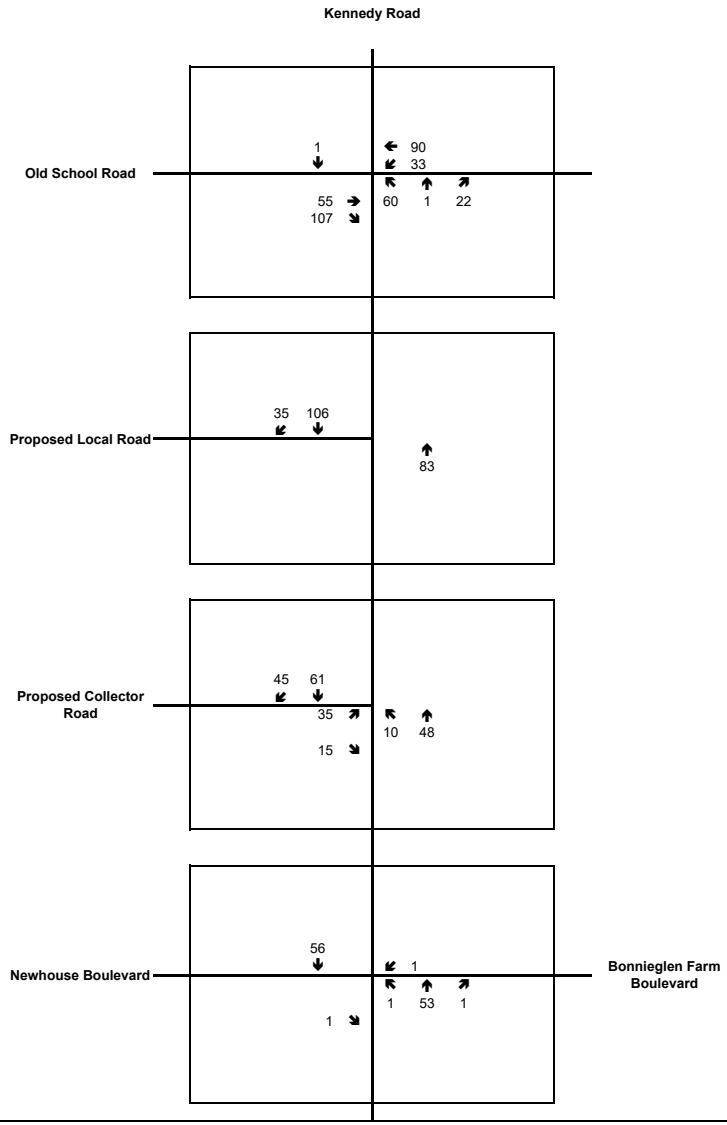

Figure No: 13

Date: June 6 2024

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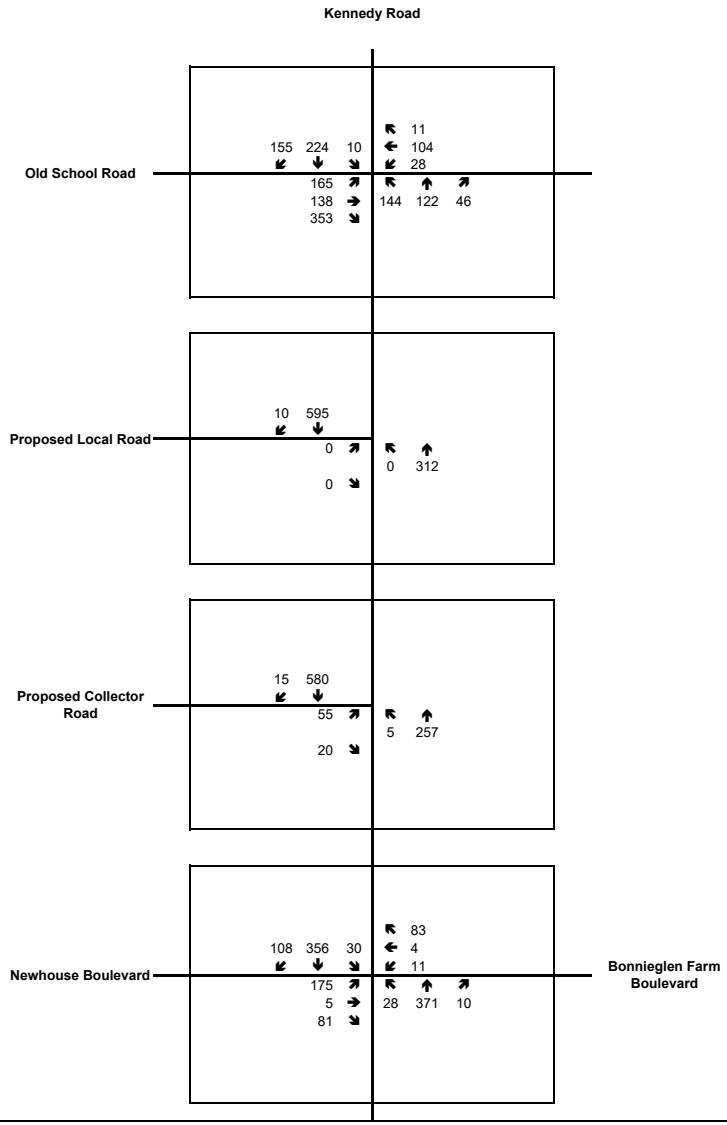
Future (2033) Total Background Traffic Volumes
A.M. Peak Hour

W22068
Proposed Residential Subdivision
Town of Caledon
Trends Development Inc.



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Date: June 14 2024

Prepared by: B.W.

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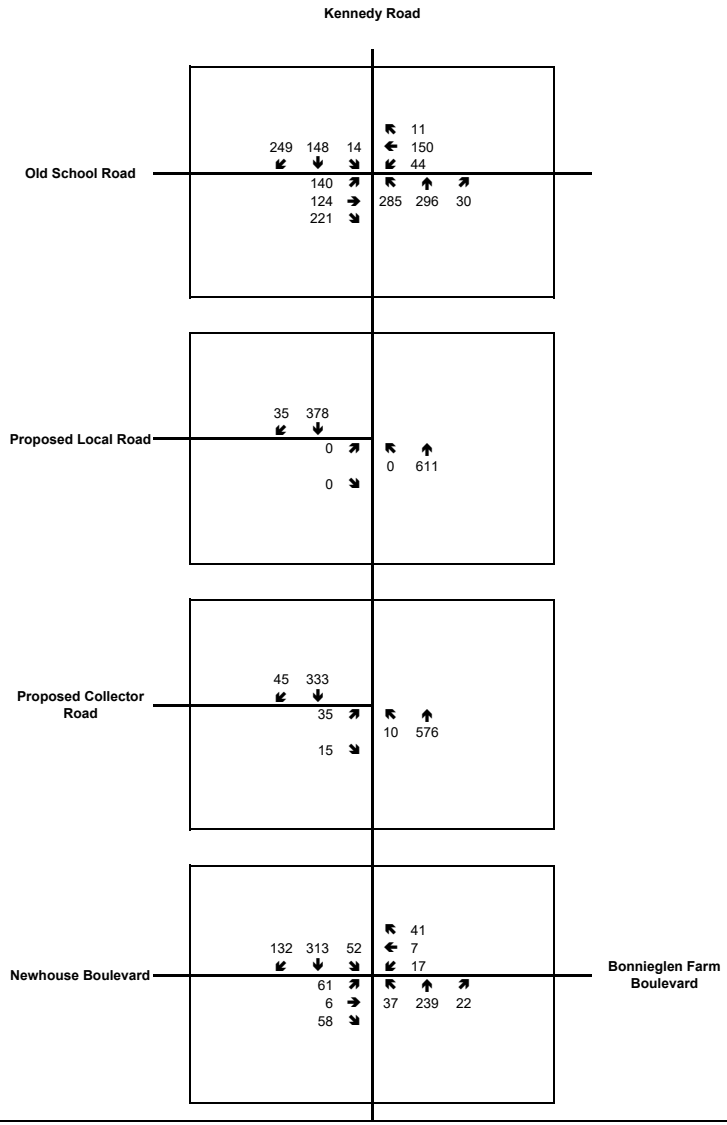
Future (2033) Total Background Traffic Volumes
P.M. Peak Hour

W22068
Proposed Residential Subdivision
Town of Caledon
Trends Development Inc.



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Date: June 14 2024

Prepared by: B.W.

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5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.4 Future (2033) Total Background Traffic Analysis

For the Future (2033) Total Background Traffic Volumes, the Level of Service (LOS) was analyzed using SYNCHRO 9.0 software.

By the 2033 interim year, between Newhouse Boulevard and Old School Road, it is anticipated that Kennedy Road will be widened to four (4) lanes and urbanized.

For the Old School Road at Kennedy Road intersection, the lane configuration used in the analysis comprises a shared through-left and a shared through-right turning lane at the northbound and southbound approaches; and a shared left-through-right turning lane at the eastbound and westbound approaches. The signal timing plans used in the Existing (2024) Traffic Analysis were adjusted to accommodate the anticipated widening of Kennedy Road.

For the Bonnieglen Farm Boulevard/Newhouse Boulevard at Kennedy Road intersection, the lane configuration used in the Existing (2024) Traffic Analysis was used in the Future (2033) Total Background Traffic Analysis.

The proposed Collector Road (Argo Kennedy Limited) at Kennedy Road and proposed Local Road (Argo Kennedy Limited) at Kennedy Road intersections were analyzed as un-signalized intersections with a stop-control at the eastbound approach. The lane configuration used in the analysis comprises a shared through-left and a through at the northbound approach; a shared left-right turning lane at the eastbound approach; and a through and shared through-right turning lane at the southbound approach.

The results of the analysis are summarized in **Table 12**. The related calculations are provided in **Appendix F**.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.4 Future (2033) Total Background Traffic Analysis (Cont'd)

Table 12: Future (2033) Total Background Traffic – Level of Service

Intersection	Turning Movement/ Approach	A.M. Peak Hour				P.M. Peak Hour			
		V/C	LOS	Delay[1]	95% Queue (m)	V/C	LOS	Delay[1]	95% Queue (m)
Old School Road at Kennedy Road (Signalized)	**Overall**	**0.91**	**C**	**21.5**	**n/a**	**0.91**	**C**	**21.7**	**n/a**
	EB Approach	0.91	C	32.9	129.9	0.91	D	44.5	119.1
	WB Approach	0.22	B	11.1	20.1	0.39	C	21.5	41.0
	NB Approach	0.37	B	16.3	25.7	0.51	B	15.1	48.5
	SB Approach	0.31	B	10.3	21.8	0.26	A	5.0	14.8
Bonnieglen Farm Boulevard/ Newhouse Boulevard at Kennedy Road (Roundabout)	**Overall**	**0.48**	**A**	**9.3**	**n/a**	**0.49**	**A**	**8.5**	**n/a**
	EB Approach	0.36	A	9.5	16.0	0.18	A	7.3	8.0
	WB Approach	0.16	A	7.6	8.0	0.09	A	6.0	0.0
	NB Approach	0.46	A	9.7	16.0	0.34	A	8.0	16.0
	SB Approach	0.48	A	9.2	24.0	0.49	A	9.4	24.0
Proposed Collector Road (Argo Kennedy Limited) at Kennedy Road (Un-signalized)	**Overall**	**0.23**	**A**	**1.3**	**n/a**	**0.23**	**A**	**0.8**	**n/a**
	EB Approach	0.18	C	15.7	5.3	0.11	B	13.7	2.9
	NB L/T	0.01	A	0.5	0.1	0.01	A	0.5	0.2
	NBT	0.10	A	0.0	0.0	0.23	A	0.0	0.0
	SBT	0.23	A	0.0	0.0	0.13	A	0.0	0.0
	SB T/R	0.12	A	0.0	0.0	0.09	A	0.0	0.0
Proposed Local Road (Argo Kennedy Limited) at Kennedy Road (Un-signalized)	**Overall**	**0.23**	**A**	**0.0**	**n/a**	**0.24**	**A**	**0.0**	**n/a**
	EB Approach	0.00	A	0.0	0.0	0.00	A	0.0	0.0
	NB L/T	0.00	A	0.0	0.0	0.00	A	0.0	0.0
	NBT	0.12	A	0.0	0.0	0.24	A	0.0	0.0
	SBT	0.23	A	0.0	0.0	0.15	A	0.0	0.0
	SB T/R	0.12	A	0.0	0.0	0.09	A	0.0	0.0

Note 1: Delays are measured in seconds per vehicle.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.4 Future (2033) Total Background Traffic Analysis (Cont'd)

Old School Road at Kennedy Road

The analysis of the Future (2033) Total Background Traffic Conditions indicates that the signalized intersection will begin to operate at a Level of Service "C" during the A.M. and P.M. Peak Hours. With the growth in background traffic, impacts to the intersection are low during the A.M. and P.M. Peak Hours.

The eastbound approach will begin to operate with a volume over capacity ratio that is greater than 0.90 during the A.M. and P.M. Peak Hours.

All of the turning movements will continue to operate at a Level of Service "C" or better during the A.M. Peak Hour and will begin to operate at a Level of Service "D" or better during the P.M. Peak Hour.

Bonnieglen Farm Boulevard/Newhouse Boulevard at Kennedy Road

The analysis of the Future (2033) Total Background Traffic Conditions indicates that the roundabout will continue to operate at a Level of Service "A" during the A.M. and P.M. Peak Hours. With the growth in background traffic, impacts to the intersection are low during the A.M. and P.M. Peak Hours.

During the A.M. and P.M. Peak Hours, all of the turning movements will continue to operate at a Level of Service "A".

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.4 Future (2033) Total Background Traffic Analysis (Cont'd)

Proposed Collector Road (Argo Kennedy Limited) at Kennedy Road

The analysis of the Future (2033) Total Background Traffic Conditions indicates that the un-signalized intersection will operate at a Level of Service "A" during the A.M. and P.M. Peak Hours.

Delays typically occur at the eastbound approach that is stop-controlled and the conflicting left-turn at the northbound approach. The eastbound approach operates at a Level of Service "C" during the A.M. Peak Hour and a Level of Service "B" during the P.M. Peak Hour. All of the other turning movements will operate at a Level of Service "A" during the A.M. and P.M. Peak Hours.

Proposed Local Road (Argo Kennedy Limited) at Kennedy Road

The analysis of the Future (2033) Total Background Traffic Conditions indicates that the un-signalized intersection will operate at a Level of Service "A" during the A.M. and P.M. Peak Hours.

Delays typically occur at the eastbound approach that is stop-controlled and the conflicting left-turn at the northbound approach. Since the eastbound approach and the northbound left turning movement do not have any traffic volumes, there are no delays experienced at this intersection.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.5 Future (2038) Total Background Traffic

The Future (2038) Total Background Traffic is based on the Existing (2024) Traffic volumes projected with 14 years of background growth plus the site-generated trips from the anticipated background developments.

The Future (2038) Total Background Traffic Volumes are illustrated in **Figures 16 and 17** for the A.M. and P.M. Peak Hours.

5.6 Future (2038) Total Background Traffic Analysis

For the Future (2038) Total Background Traffic Volumes, the Level of Service (LOS) was analyzed using SYNCHRO 9.0 software.

By 2041, between Winston Churchill Boulevard and Airport Road, it is anticipated that Old School Road will be widened to four (4) lanes and urbanized. This Study will assume that this improvement will be completed by the 2038 horizon year.

For the Old School Road at Kennedy Road intersection, the signal timing plans used in the Future (2033) Total Background Traffic Analysis were adjusted to accommodate the anticipated widening of Old School Road. Unlike the conditions that are presented to Kennedy Road, the ROW width for Old School Road allows for the construction of left-turn lanes. As a result, since left-turn lanes are warranted during the A.M. and P.M. Peak Hours for the eastbound and westbound approaches, left-turn lanes on Old School Road are recommended[13]. The lane configuration used in the analysis comprises a shared through-left and a shared through-right turning lane at the northbound and southbound approaches; and a left, a through and a shared through-right turning lane at the eastbound and westbound approaches.

[13] Geometric Design Standards for Ontario Highways, Ministry of Transportation Ontario

Future (2038) Total Background Traffic Volumes
A.M. Peak Hour

W22068
Proposed Residential Subdivision
Town of Caledon
Trends Development Inc.

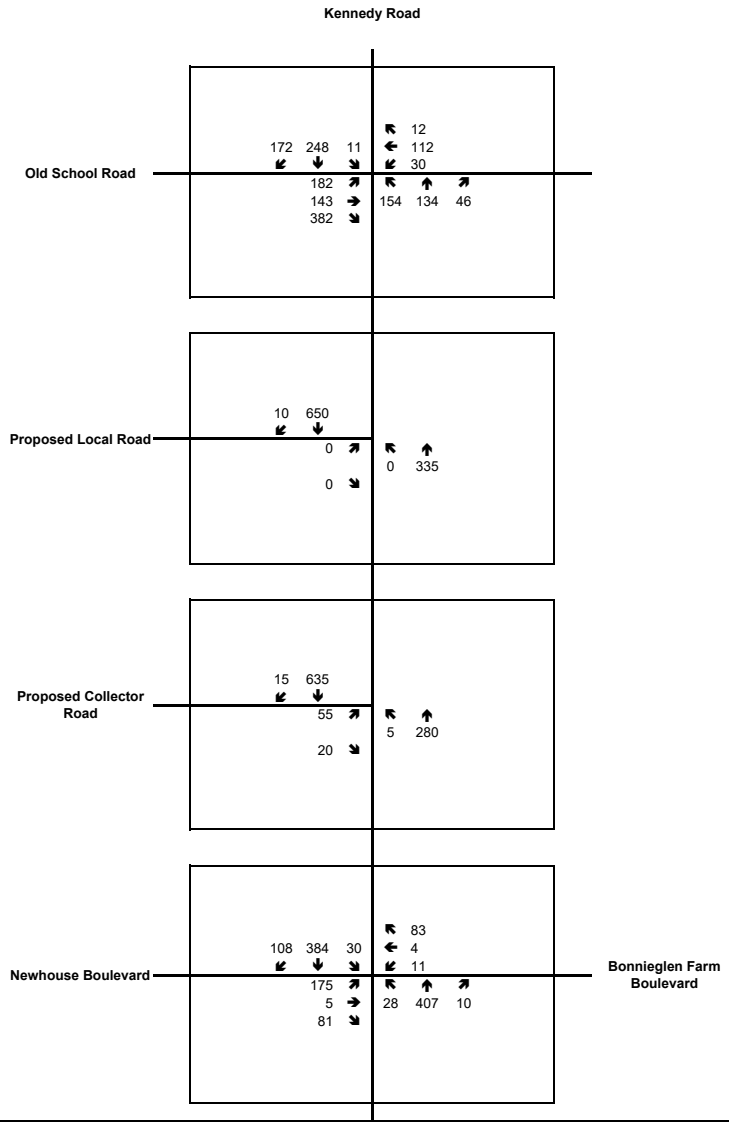

Figure No: 16

Date: June 14 2024

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Future (2038) Total Background Traffic Volumes
P.M. Peak Hour

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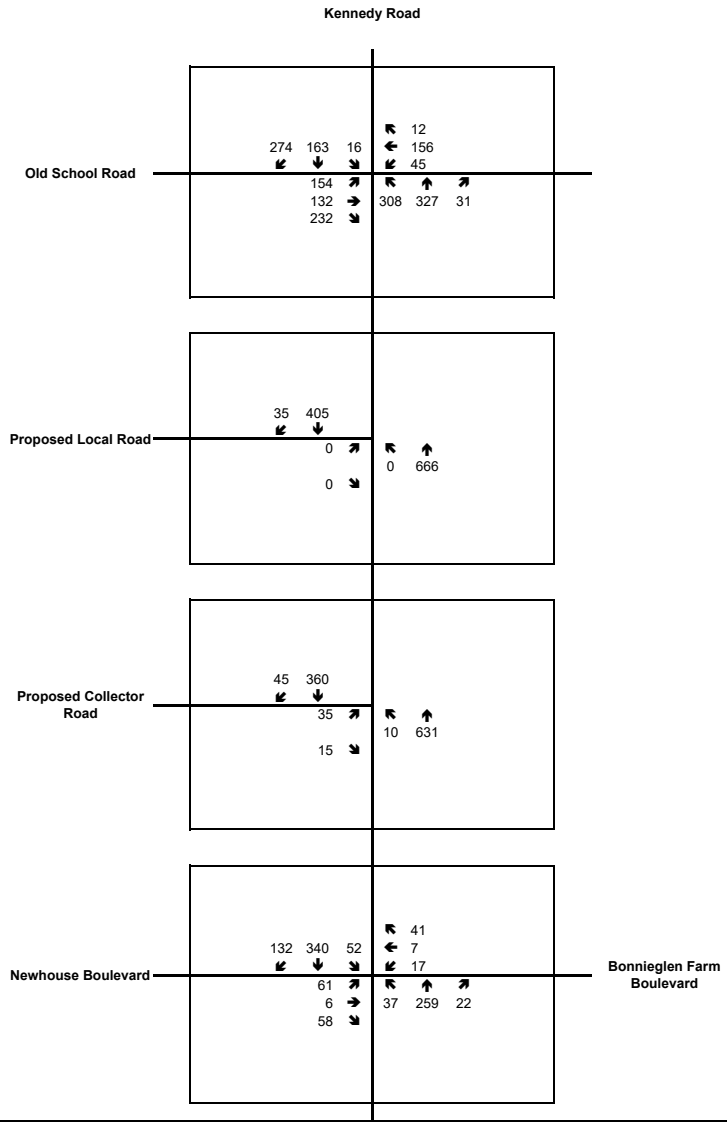

Figure No: 17

Date: June 14 2024

Prepared by: B.W.

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5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.6 Future (2038) Total Background Traffic Analysis (Cont'd)

For the Bonnieglen Farm Boulevard/Newhouse Boulevard at Kennedy Road, proposed Collector Road (Argo Kennedy Limited) at Kennedy Road and proposed (Argo Kennedy Limited) Local Road at Kennedy Road intersections, the lane configuration used in the Future (2033) Total Background Traffic Analysis was used in the Future (2038) Total Background Traffic Analysis.

The results of the analysis are summarized in **Table 13**. The related calculations are provided in **Appendix F**.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.6 Future (2038) Total Background Traffic Analysis (Cont'd)

Table 13: Future (2038) Total Background Traffic – Level of Service

Intersection	Turning Movement/ Approach	A.M. Peak Hour				P.M. Peak Hour			
		V/C	LOS	Delay[1]	95% Queue (m)	V/C	LOS	Delay[1]	95% Queue (m)
Old School Road at Kennedy Road (Signalized)	**Overall**	**0.57**	**A**	**9.5**	**n/a**	**0.57**	**B**	**11.1**	**n/a**
	EBL	0.57	C	25.3	33.4	0.57	C	31.8	34.6
	EB T/R	0.47	A	6.2	16.0	0.40	A	9.3	17.1
	WBL	0.16	B	17.4	7.9	0.20	C	22.7	12.6
	WB T/R	0.14	B	14.1	9.9	0.21	B	19.7	15.7
	NB Approach	0.29	A	8.8	20.4	0.48	A	9.8	44.3
	SB Approach	0.26	A	5.5	17.4	0.24	A	3.2	13.0
Bonnieglen Farm Boulevard/ Newhouse Boulevard at Kennedy Road (Roundabout)	**Overall**	**0.51**	**A**	**9.9**	**n/a**	**0.52**	**A**	**8.9**	**n/a**
	EB Approach	0.37	A	10.0	16.0	0.19	A	7.6	8.0
	WB Approach	0.16	A	7.9	8.0	0.09	A	6.2	0.0
	NB Approach	0.50	B	10.5	24.0	0.37	A	8.4	16.0
	SB Approach	0.51	A	9.7	24.0	0.52	A	9.9	24.0
Proposed Collector Road (Argo Kennedy Limited) at Kennedy Road (Un-signalized)	**Overall**	**0.25**	**A**	**1.3**	**n/a**	**0.25**	**A**	**0.7**	**n/a**
	EB Approach	0.20	C	16.9	5.9	0.12	B	14.4	3.1
	NB L/T	0.01	A	0.5	0.1	0.01	A	0.4	0.2
	NBT	0.11	A	0.0	0.0	0.25	A	0.0	0.0
	SBT	0.25	A	0.0	0.0	0.14	A	0.0	0.0
	SB T/R	0.13	A	0.0	0.0	0.10	A	0.0	0.0
Proposed Local Road (Argo Kennedy Limited) at Kennedy Road (Un-signalized)	**Overall**	**0.25**	**A**	**0.0**	**n/a**	**0.26**	**A**	**0.0**	**n/a**
	EB Approach	0.00	A	0.0	0.0	0.00	A	0.0	0.0
	NB L/T	0.00	A	0.0	0.0	0.00	A	0.0	0.0
	NBT	0.13	A	0.0	0.0	0.26	A	0.0	0.0
	SBT	0.25	A	0.0	0.0	0.16	A	0.0	0.0
	SB T/R	0.13	A	0.0	0.0	0.10	A	0.0	0.0

Note 1: Delays are measured in seconds per vehicle.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.6 Future (2038) Total Background Traffic Analysis (Cont'd)

Old School Road at Kennedy Road

The analysis of the Future (2038) Total Background Traffic Conditions indicates that the signalized intersection will improve to a Level of Service "A" during the A.M. Peak Hour and a Level of Service "B" during the P.M. Peak Hour. With the road widening on Old School Road, improvements to the intersection will be moderate during the A.M. and P.M. Peak Hours.

All of the turning movements will continue to operate at a Level of Service "C" or better during the A.M. Peak Hour and will begin to operate at a Level of Service "C" or better during the P.M. Peak Hour.

Bonnieglen Farm Boulevard/Newhouse Boulevard at Kennedy Road

The analysis of the Future (2038) Total Background Traffic Conditions indicates that the roundabout will continue to operate at a Level of Service "A" during the A.M. and P.M. Peak Hours. With the growth in background traffic, impacts to the intersection are minimal during the A.M. and P.M. Peak Hours.

All of the turning movements will begin to operate at a Level of Service "B" or better during the A.M. Peak Hour and will continue to operate at a Level of Service "A" during the P.M. Peak Hour.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.6 Future (2038) Total Background Traffic Analysis (Cont'd)

Proposed Collector Road (Argo Kennedy Limited) at Kennedy Road

The analysis of the Future (2038) Total Background Traffic Conditions indicates that the un-signalized intersection will continue to operate at a Level of Service "A" during the A.M. and P.M. Peak Hours. With the growth in background traffic, impacts to the intersection are minimal during the A.M. and P.M. Peak Hours.

Delays typically occur at the eastbound approach that is stop-controlled and the conflicting left-turn at the northbound approach. The eastbound approach will continue to operate at a Level of Service "C" during the A.M. Peak Hour and a Level of Service "B" during the P.M. Peak Hour. All of the other turning movements will continue to operate at a Level of Service "A" during the A.M. and P.M. Peak Hours.

Proposed Local Road (Argo Kennedy Limited) at Kennedy Road

The analysis of the Future (2038) Total Background Traffic Conditions indicates that the un-signalized intersection will continue to operate at a Level of Service "A" during the A.M. and P.M. Peak Hours.

Delays typically occur at the eastbound approach that is stop-controlled and the conflicting left-turn at the northbound approach. Since the eastbound approach and the northbound left turning movement do not have any traffic volumes, there are no delays experienced at this intersection. The growth in background traffic will not have any impacts to the intersection.

6. TRIP GENERATION AND DISTRIBUTION

6.1. Trip Generation

For the single detached homes (Land Use 210), semi-detached homed (Land Use 215) and townhouse units (Land Use 220), the trip generation rates and formulae from the ITE Trip Generation Manual 11th Edition were applied for the A.M. and P.M. Peak Hours. The worst-case between the trip generation rate and the trip generation formula was applied for each scenario. Relevant excerpts from the ITE Trip Generation Manual are provided in **Appendix G**.

Table 14 summarizes the trip generation rates and formulae along with the percentages of incoming and outgoing trips for the A.M. and P.M. Peak Hours.

Table 14: Trip Generation Rates and Formulae with Inbound and Outbound Percentages

ITE Land Use	A.M. Peak Hour			P.M. Peak Hour		
	Trip Rate/ Fitted Curve Equation	% In	% Out	Trip Rate/ Fitted Curve Equation	% In	% Out
Single-Family Detached Housing (LU 210)	0.70 (Note 1)	26%	74%	Ln(T) = 0.94Ln(X) + 0.27 (Note 2)	63%	37%
Single-Family Attached Housing (LU 215)	0.48 (Note 1)	25%	75%	0.57 (Note 1)	59%	41%
Multifamily Housing (Low-Rise) (LU 220)	T = 0.31X + 22.85 (Note 2)	24%	76%	T = 0.43X + 20.55 (Note 2)	63%	37%

Note 1: The trip rate is per dwelling unit.
Note 2: T represents the total number of trips and X represents the number of dwelling units.

6. TRIP GENERATION AND DISTRIBUTION (CONT'D)

6.2 Total Site-Generated Trips

For the single detached homes, the semi-detached homes and the townhouse units, the resulting number of trips generated was determined by using the trip generation rates and formulae provided in **Table 14** and the number of dwelling units. The proposed Residential Subdivision comprises 230 single detached homes, 56 semi-detached homes and 99 street townhouse units. For the three (3) medium density (condominium) blocks and the block with a mixed use/mid-rise portion and a residential (special) portion, since the details and the timing of the developments are not known at this time, the land uses were not included in the analysis for this Study. A traffic assessment of these blocks will be provided at the site plan approval stage for these developments.

The resulting number of trips generated is provided in **Table 15** for the A.M. and P.M. Peak Hours of adjacent street traffic.

Table 15: Site-Generated Trips

Land Use	No. of Dwelling Units	A.M. Peak Hour (Adj. Street)			P.M. Peak Hour (Adj. Street)		
		Trips In	Trips Out	Total	Trips In	Trips Out	Total
Single-Family Detached Housing	230	42	119	161	137	80	217
Single-Family Attached Housing	56	7	20	27	19	13	32
Multifamily Housing (Low-Rise)	99	13	41	54	40	23	63
Total	385	62	180	**242**	196	116	**312**

The proposed Residential Subdivision is expected to generate a total of 242 net trips during the A.M. Peak Hour (62 inbound trips and 180 outbound trips) and 312 net trips during the P.M. Peak Hour (196 inbound trips and 116 outbound trips).

6. TRIP GENERATION AND DISTRIBUTION (CONT'D)

6.3 Trip Distribution and Assignment

For the residential land uses, based on the nature of the land use, the majority of the trips generated will not be local traffic. Therefore, the A.M. Peak Period work trip distribution from the 2016 Transportation Tomorrow Survey and the future road network were utilized for the assumed trip distribution and trip assignment. The assumptions and the calculations made for the trip assignment is provided in **Appendix H**.

The assumed trip distribution and assignment will be as follows:

- 4% (4%) to/from the north via Kennedy Road,
- 8% (8%) to/from the east via Old School Road,
- 53% (53%) to/from the south via Kennedy Road,
- 35% (35%) to/from the west via Old School Road.

The site-generated trip volumes and trip assignment used in the analysis for the proposed Residential Subdivision are illustrated in **Figures 18 and 19**.

Trip Assignment of the Subject Subdivision - A.M. Peak Hour

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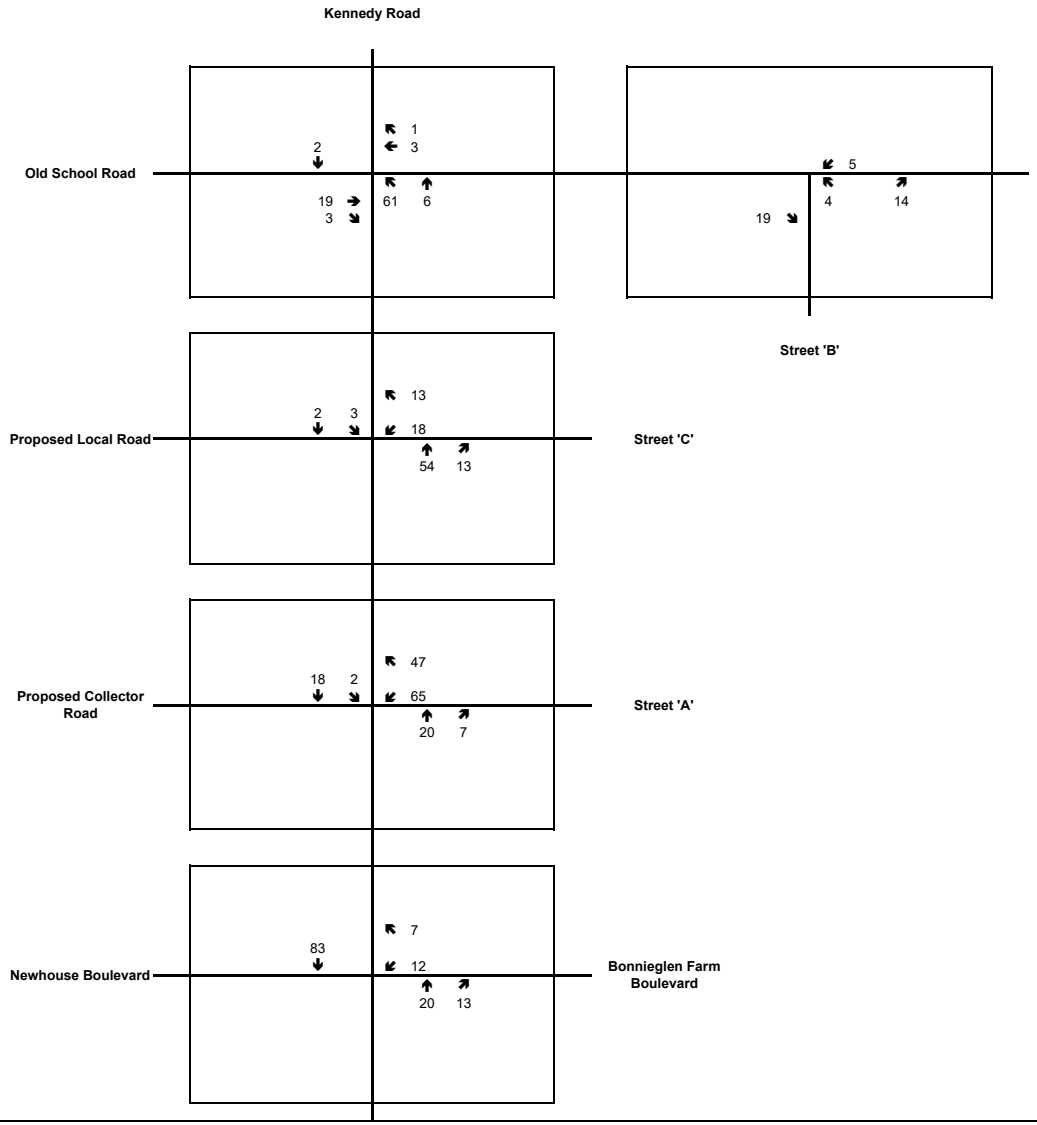

Figure No: 18

Date: August 14 2024

Prepared by: B.W.

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Trip Assignment of the Subject Subdivision - P.M. Peak Hour

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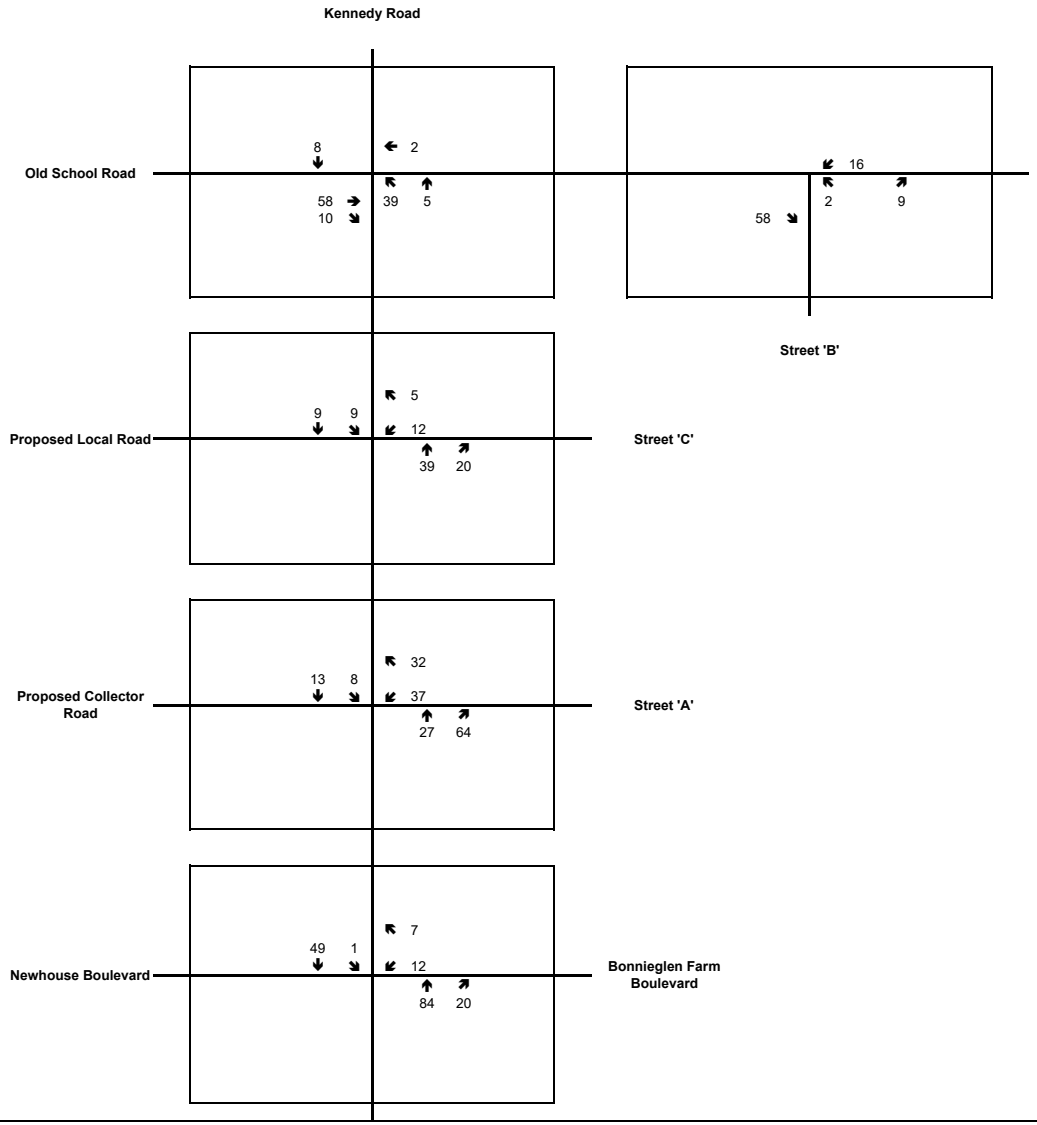

Figure No: 19

Date: August 14 2024

Prepared by: B.W.

7. FUTURE TOTAL TRAFFIC CONDITIONS

7.1 Future (2033) Total Traffic

The Site-Generated traffic volumes from the proposed Residential Subdivision were added to the Future (2033) Total Background Traffic to yield the Future (2033) Total Traffic Volumes.

The Future (2033) Total Traffic Volumes are provided in **Figures 20 and 21** for the A.M. and P.M. Peak Hours.

7.2 Future (2033) Total Traffic Analysis

For the Future (2033) Total Traffic Volumes, the Level of Service (LOS) was analyzed using SYNCHRO 9.0 software.

For the Old School Road at Kennedy Road and Bonnieglen Farm Boulevard/Newhouse Boulevard at Kennedy Road intersections, the signal timing plans and the lane configuration used in the Future (2033) Total Background Analysis were used in the Future (2033) Total Traffic Analysis.

Street 'A'/proposed Collector Road at Kennedy Road and Street 'C'/proposed Local Road at Kennedy Road were analyzed as un-signalized intersections with stop-controls at the eastbound and westbound approaches. The lane configuration used in the analysis comprises a shared through-left and a shared through-right turning lane at the northbound and southbound approaches; and a shared left-through-right turning lane at the eastbound and westbound approaches.

Street 'B' at Old School Road was analyzed as an un-signalized intersection with a stop-control at the northbound approach. The lane configuration used in the analysis comprises a shared left-right turning lane at the northbound approach; a shared through-right turning lane at the eastbound approach; and a shared through-left turning lane at the westbound approach.

Future (2033) Total Traffic Volumes - A.M. Peak Hour

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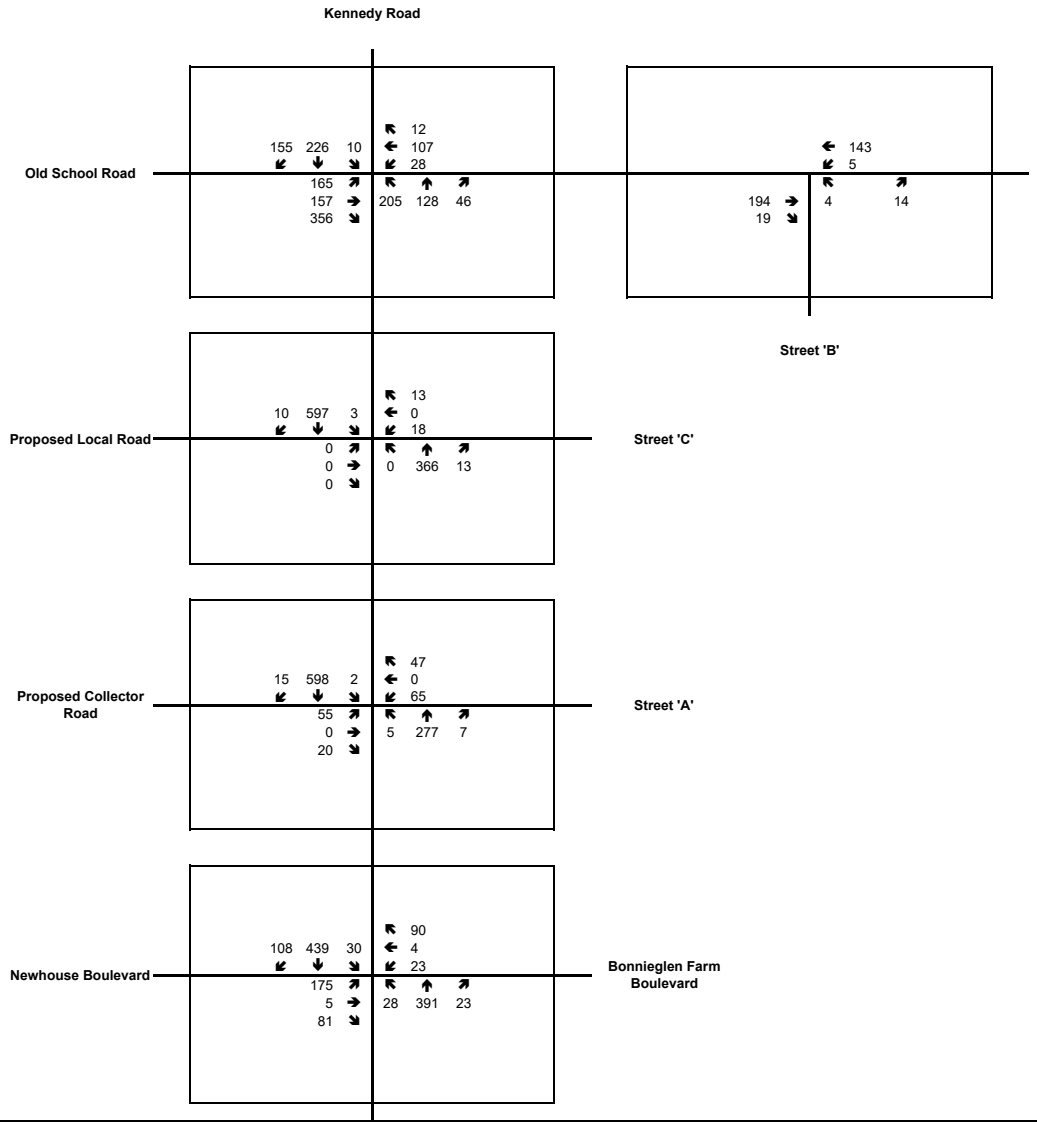

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Date: August 14 2024

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Future (2033) Total Traffic Volumes - P.M. Peak Hour

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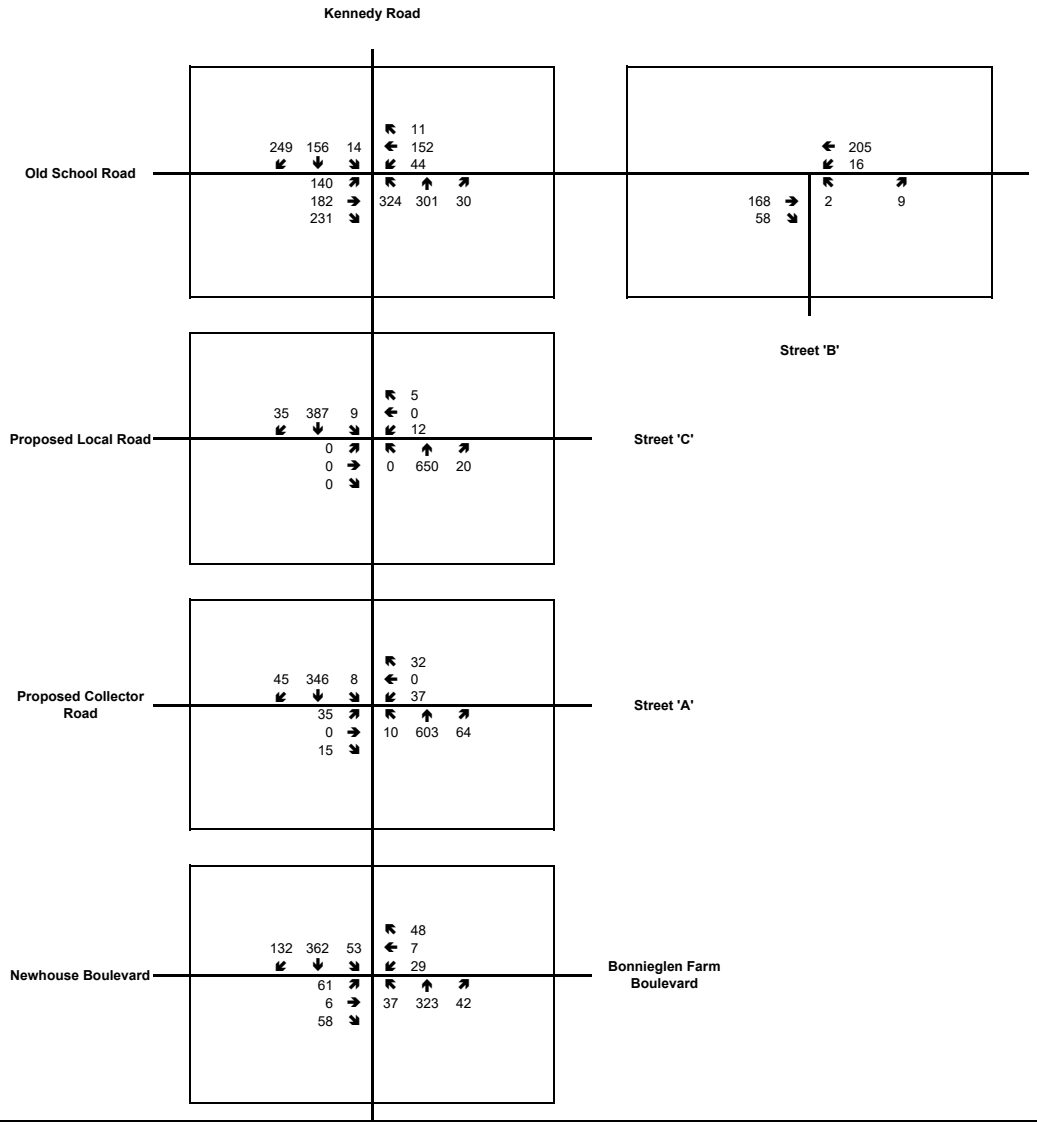

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Date: August 14 2024

Prepared by: B.W.

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7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.2 Future (2033) Total Traffic Analysis (Cont'd)

The results of the analysis are summarized in **Table 16**. The related calculations are provided in **Appendix F**.

Table 16: Future (2033) Total Traffic – Level of Service

Intersection	Turning Movement/ Approach	A.M. Peak Hour				P.M. Peak Hour			
		V/C	LOS	Delay[1]	95% Queue (m)	V/C	LOS	Delay[1]	95% Queue (m)
Old School Road at Kennedy Road (Signalized)	**Overall**	**0.92**	**C**	**22.8**	**n/a**	**0.97**	**C**	**26.2**	**n/a**
	EB Approach	0.92	C	34.7	137.9	0.97	E	55.2	144.9
	WB Approach	0.22	B	10.9	20.4	0.38	C	21.1	41.6
	NB Approach	0.47	B	18.6	32.6	0.57	B	16.8	53.5
	SB Approach	0.32	B	10.6	22.0	0.26	A	5.2	15.3
Bonnieglen Farm Boulevard/ Newhouse Boulevard at Kennedy Road (Roundabout)	**Overall**	**0.57**	**B**	**10.7**	**n/a**	**0.55**	**A**	**9.8**	**n/a**
	EB Approach	0.40	B	11.1	16.0	0.19	A	7.9	8.0
	WB Approach	0.19	A	8.2	8.0	0.13	A	7.0	0.0
	NB Approach	0.50	B	10.6	24.0	0.46	A	10.0	16.0
	SB Approach	0.57	B	11.0	32.0	0.55	B	10.6	24.0
Street 'A'/ Proposed Collector Road at Kennedy Road (Un-signalized)	**Overall**	**0.24**	**A**	**3.0**	**n/a**	**0.21**	**A**	**1.9**	**n/a**
	EB Approach	0.24	C	20.3	7.4	0.14	C	16.7	3.9
	WB Approach	0.23	B	14.7	7.1	0.20	C	18.1	5.9
	NB L/T	0.01	A	0.4	0.1	0.01	A	0.3	0.2
	NB T/R	0.09	A	0.0	0.0	0.21	A	0.0	0.0
	SB L/T	0.00	A	0.1	0.0	0.01	A	0.5	0.2
	SB T/R	0.18	A	0.0	0.0	0.13	A	0.0	0.0

Note 1: Delays are measured in seconds per vehicle.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.2 Future (2033) Total Traffic Analysis (Cont'd)

Table 16: Future (2033) Total Traffic – Level of Service

Intersection	Turning Movement/ Approach	A.M. Peak Hour				P.M. Peak Hour			
		V/C	LOS	Delay[1]	95% Queue (m)	V/C	LOS	Delay[1]	95% Queue (m)
Street 'C'/ Proposed Local Road at Kennedy Road (Un-signalized)	**Overall**	**0.18**	**A**	**0.4**	**n/a**	**0.20**	**A**	**0.4**	**n/a**
	EB Approach	0.00	A	0.0	0.0	0.00	A	0.0	0.0
	WB Approach	0.07	B	13.6	1.8	0.06	C	17.8	1.4
	NB L/T	0.00	A	0.0	0.0	0.00	A	0.0	0.0
	NB T/R	0.12	A	0.0	0.0	0.20	A	0.0	0.0
	SB L/T	0.00	A	0.1	0.1	0.01	A	0.5	0.2
	SB T/R	0.18	A	0.0	0.0	0.13	A	0.0	0.0
Street 'B' at Old School Road (Un-signalized)	**Overall**	**0.13**	**A**	**0.6**	**n/a**	**0.13**	**A**	**0.5**	**n/a**
	EB Approach	0.13	A	0.0	0.0	0.13	A	0.0	0.0
	WB Approach	0.00	A	0.3	0.1	0.01	A	0.7	0.3
	NB Approach	0.02	A	9.7	0.6	0.01	A	9.7	0.3

Note 1: Delays are measured in seconds per vehicle.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.2 Future (2033) Total Traffic Analysis (Cont'd)

Old School Road at Kennedy Road

The analysis of the Future (2033) Total Traffic Conditions indicates that the signalized intersection will continue to operate at a Level of Service "C" during the A.M. and P.M. Peak Hours. With the inclusion of site-generated traffic, impacts will be low during the A.M. and P.M. Peak Hours.

The eastbound approach will continue to operate with a volume over capacity ratio that is greater than 0.90 during the A.M. and P.M. Peak Hours.

All of the turning movements will continue to operate at a Level of Service "C" or better during the A.M. Peak Hour and will begin to operate at a Level of Service "E" or better during the P.M. Peak Hour.

Bonnieglen Farm Boulevard/Newhouse Boulevard at Kennedy Road

The analysis of the Future (2033) Total Traffic Conditions indicates that the roundabout intersection will begin to operate at a Level of Service "B" during the A.M. and will continue to operate at a Level of Service "A" during the P.M. Peak Hour. With the inclusion of site-generated traffic, impacts will be low during the A.M. and P.M. Peak Hours.

All of the turning movements will begin to operate at a Level of Service "B" or better during the A.M. and P.M. Peak Hours.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.2 Future (2033) Total Traffic Analysis (Cont'd)

Street 'A'/proposed Collector Road at Kennedy Road

The analysis of the Future (2033) Total Traffic Conditions indicates that the un-signalized intersection will continue to operate at a Level of Service "A" during the A.M. and P.M. Peak Hours. With the inclusion of site-generated traffic, impacts will be low during the A.M. and P.M. Peak Hours.

All of the turning movements will continue to operate at a Level of Service "C" or better during the A.M. Peak Hour and will begin to operate at a Level of Service "C" or better during the P.M. Peak Hour.

Street 'C'/proposed Local Road at Kennedy Road

The analysis of the Future (2033) Total Traffic Conditions indicates that the un-signalized intersection will continue to operate at a Level of Service "A" during the A.M. and P.M. Peak Hours. With the inclusion of site-generated traffic, impacts will be moderate during the A.M. and P.M. Peak Hours.

All of the turning movements will begin to operate at a Level of Service "B" or better during the A.M. Peak Hour and a Level of Service "C" or better during the P.M. Peak Hour.

Street 'B' at Old School Road

The analysis of the Future (2033) Total Traffic Conditions indicates that the un-signalized intersection will operate at a Level of Service "A" during the A.M. and P.M. Peak Hours.

During the A.M. and P.M. Peak Hours, all of the turning movements will operate at a Level of Service "A". Delays typically occur at the northbound approach with the stop-control and the westbound approach with the conflicting left-turn.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.3 Future (2038) Total Traffic

The Site-Generated traffic volumes from the proposed Residential Subdivision were added to the Future (2038) Total Background Traffic to yield the Future (2033) Total Traffic Volumes.

The Future (2038) Total Traffic Volumes are provided in **Figures 22 and 23** for the A.M. and P.M. Peak Hours.

7.4 Future (2038) Total Traffic Analysis

For the Future (2038) Total Traffic Volumes, the Level of Service (LOS) was analyzed using SYNCHRO 9.0 software.

For the Old School Road at Kennedy Road and Bonnieglen Farm Boulevard/Newhouse Boulevard at Kennedy Road intersections, the signal timing plans and the lane configuration used in the Future (2038) Total Background Analysis were used in the Future (2038) Total Traffic Analysis.

For the Street 'A'/proposed Collector Road at Kennedy Road and Street 'C'/proposed Local Road at Kennedy Road intersections, the lane configuration used in the Future (2033) Total Traffic Analysis was used in the Future (2038) Total Traffic Analysis.

Street 'B' at Old School Road was analyzed as an un-signalized intersection with a stop-control at the northbound approach. The lane configuration used in the analysis comprises a shared left-right turning lane at the northbound approach; a through and a shared through-right turning lane at the eastbound approach; and a shared through-left and a through lane at the westbound approach.

The results of the analysis are summarized in **Table 17**. The related calculations are provided in **Appendix F**.

Future (2038) Total Traffic Volumes - A.M. Peak Hour

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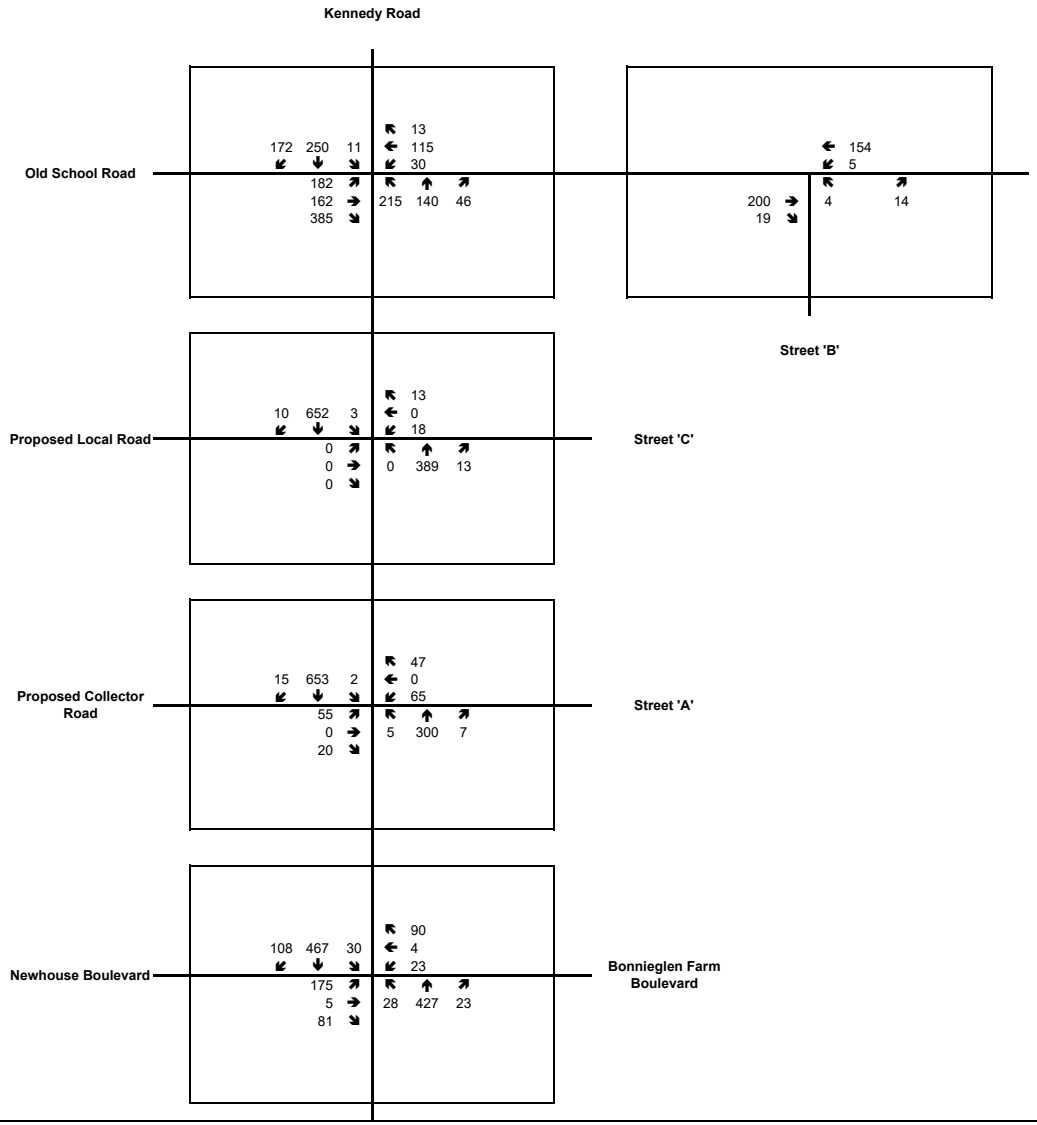

Figure No: 22

Date: August 14 2024

Prepared by: B.W.

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Future (2038) Total Traffic Volumes - P.M. Peak Hour

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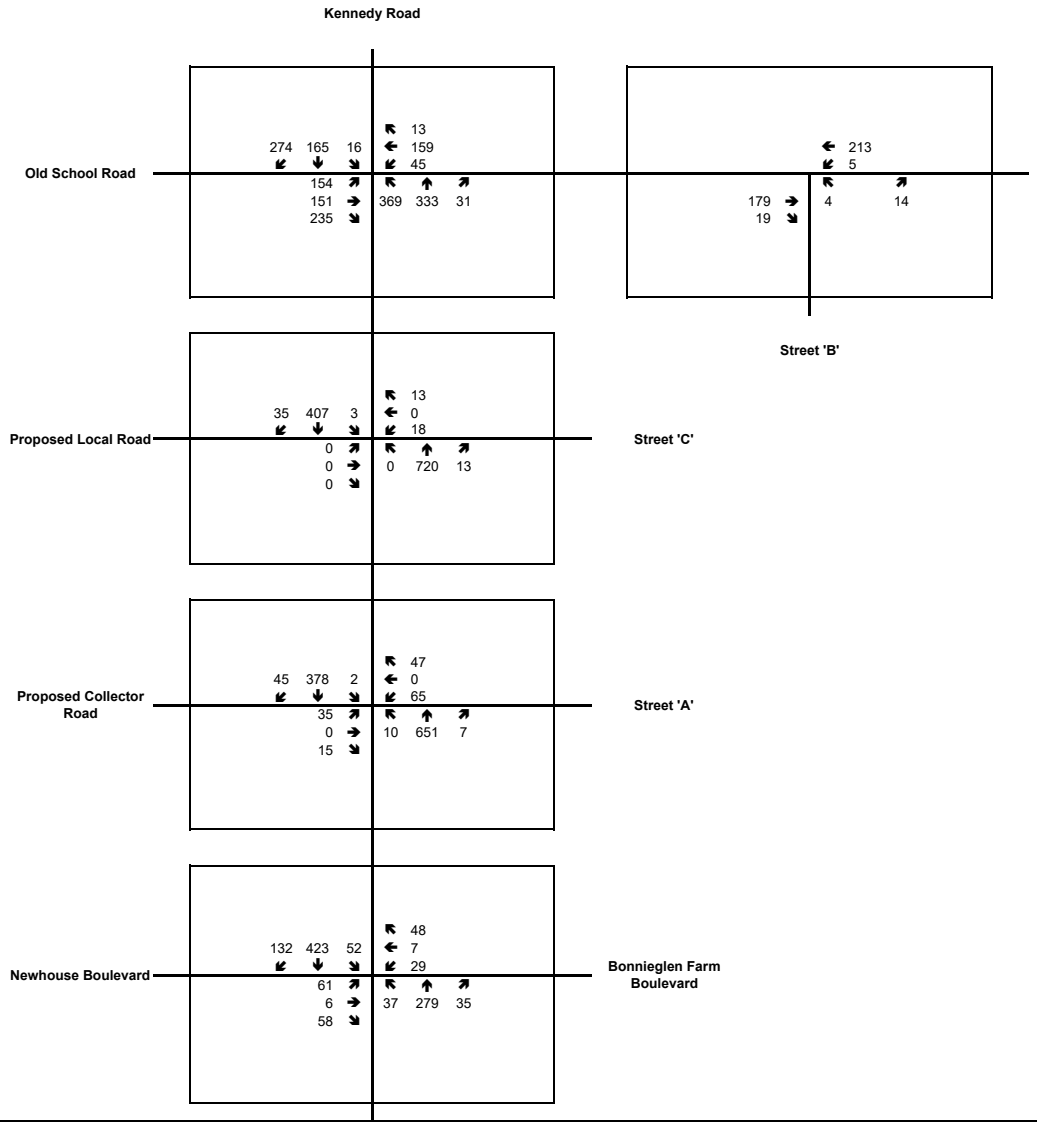

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Date: August 14 2024

Prepared by: B.W.

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7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.4 Future (2038) Total Traffic Analysis (Cont'd)

Table 17: Future (2038) Total Traffic – Level of Service

Intersection	Turning Movement/ Approach	A.M. Peak Hour				P.M. Peak Hour			
		V/C	LOS	Delay[1]	95% Queue (m)	V/C	LOS	Delay[1]	95% Queue (m)
Old School Road at Kennedy Road (Signalized)	**Overall**	**0.57**	**A**	**9.9**	**n/a**	**0.57**	**B**	**11.5**	**n/a**
	EBL	0.57	C	25.2	33.5	0.57	C	31.8	34.7
	EB T/R	0.49	A	6.6	17.6	0.42	A	9.9	18.6
	WBL	0.17	B	17.8	8.0	0.21	C	22.9	12.6
	WB T/R	0.15	B	14.1	10.6	0.21	B	19.6	16.0
	NB Approach	0.39	B	10.2	28.0	0.54	B	10.6	51.3
	SB Approach	0.26	A	5.6	17.7	0.24	A	3.2	13.2
Bonnieglen Farm Boulevard/ Newhouse Boulevard at Kennedy Road (Roundabout)	**Overall**	**0.60**	**B**	**12.2**	**n/a**	**0.61**	**B**	**10.3**	**n/a**
	EB Approach	0.43	B	12.4	16.0	0.21	A	8.5	8.0
	WB Approach	0.40	B	12.0	16.0	0.12	A	6.6	0.0
	NB Approach	0.56	B	11.9	32.0	0.40	A	8.9	16.0
	SB Approach	0.60	B	12.6	32.0	0.61	B	12.0	32.0
Street 'A'/ Proposed Collector Road at Kennedy Road (Un-signalized)	**Overall**	**0.28**	**A**	**1.9**	**n/a**	**0.35**	**A**	**2.8**	**n/a**
	EB Approach	0.28	C	22.1	9.0	0.16	C	18.3	4.4
	WB Approach	0.02	B	10.1	0.6	0.35	C	22.1	12.1
	NB L/T	0.01	A	0.3	0.1	0.01	A	0.3	0.2
	NB T/R	0.10	A	0.0	0.0	0.20	A	0.0	0.0
	SB L/T	0.00	A	0.1	0.0	0.00	A	0.1	0.1
	SB T/R	0.20	A	0.0	0.0	0.14	A	0.0	0.0

Note 1: Delays are measured in seconds per vehicle.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.4 Future (2038) Total Traffic Analysis (Cont'd)

Table 17: Future (2038) Total Traffic – Level of Service

Intersection	Turning Movement/ Approach	A.M. Peak Hour				P.M. Peak Hour			
		V/C	LOS	Delay[1]	95% Queue (m)	V/C	LOS	Delay[1]	95% Queue (m)
Street 'C'/ Proposed Local Road at Kennedy Road (Un-signalized)	**Overall**	**0.20**	**A**	**1.2**	**n/a**	**0.22**	**A**	**0.5**	**n/a**
	EB Approach	0.02	C	22.2	0.6	0.00	A	0.0	0.0
	WB Approach	0.17	B	13.2	4.8	0.10	C	18.3	2.7
	NB L/T	0.00	A	0.0	0.0	0.00	A	0.0	0.0
	NB T/R	0.13	A	0.0	0.0	0.22	A	0.0	0.0
	SB L/T	0.01	A	0.5	0.3	0.00	A	0.2	0.1
	SB T/R	0.20	A	0.0	0.0	0.14	A	0.0	0.0
Street 'B' at Old School Road (Un-signalized)	**Overall**	**0.08**	**A**	**0.9**	**n/a**	**0.08**	**A**	**0.5**	**n/a**
	EBT	0.08	A	0.0	0.0	0.07	A	0.0	0.0
	EB T/R	0.05	A	0.0	0.0	0.05	A	0.0	0.0
	WB L/T	0.01	A	1.0	0.1	0.00	A	0.5	0.1
	WBT	0.06	A	0.0	0.0	0.08	A	0.0	0.0
	NB Approach	0.04	A	9.7	1.1	0.02	A	9.3	0.5

Note 1: Delays are measured in seconds per vehicle.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.4 Future (2038) Total Traffic Analysis (Cont'd)

Old School Road at Kennedy Road

The analysis of the Future (2038) Total Traffic Conditions indicates that the signalized intersection will continue to operate at a Level of Service "A" during the A.M. Peak Hour and a Level of Service "B" during the P.M. Peak Hour. With the inclusion of site-generated traffic, impacts will be minimal during the A.M. and P.M. Peak Hours.

During the A.M. and P.M. Peak Hours, all of the turning movements will continue to operate at a Level of Service "C" or better.

Bonnieglen Farm Boulevard/Newhouse Boulevard at Kennedy Road

The analysis of the Future (2038) Total Traffic Conditions indicates that the roundabout intersection will begin to operate at a Level of Service "B" during the A.M. and P.M. Peak Hours. With the inclusion of site-generated traffic, impacts will be low during the A.M. and P.M. Peak Hours.

All of the turning movements will continue to operate at a Level of Service "B" or better during the A.M. Peak Hour and will begin to operate at a Level of Service "B" or better during the P.M. Peak Hour.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.4 Future (2038) Total Traffic Analysis (Cont'd)

Street 'A'/proposed Collector Road at Kennedy Road

The analysis of the Future (2038) Total Traffic Conditions indicates that the un-signalized intersection will continue to operate at a Level of Service "A" during the A.M. and P.M. Peak Hours. With the inclusion of site-generated traffic, impacts will be low during the A.M. and P.M. Peak Hours.

All of the turning movements will continue to operate at a Level of Service "C" or better during the A.M. Peak Hour and will begin to operate at a Level of Service "C" or better during the P.M. Peak Hour.

Street 'C'/proposed Local Road at Kennedy Road

The analysis of the Future (2038) Total Traffic Conditions indicates that the un-signalized intersection will continue to operate at a Level of Service "A" during the A.M. and P.M. Peak Hours. With the inclusion of site-generated traffic, impacts will be moderate during the A.M. and P.M. Peak Hours.

All of the turning movements will begin to operate at a Level of Service "C" or better during the A.M. and P.M. Peak Hours.

Street 'B' at Old School Road

The analysis of the Future (2038) Total Traffic Conditions indicates that the un-signalized intersection will continue to operate at a Level of Service "A" during the A.M. and P.M. Peak Hours. With the widening of Old School Road, improvements will be minimal during the A.M. and P.M. Peak Hours.

During the A.M. and P.M. Peak Hours, all of the turning movements will continue to operate at a Level of Service "A".

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.5 Traffic Analysis for the Proposed Intersections within the Subject Subdivision

Unlike the un-signalized intersections analyzed in the Future (2033 & 2038) Total Analysis, background traffic using the proposed intersections within the Subject Subdivision is expected to be low at worse. Since the un-signalized intersections analyzed in the Future (2033 & 2038) Total Analysis will have acceptable Levels of Service, the proposed intersections within the Subject Subdivision will operate at acceptable Levels of Service with the stop-controls provided in **Figure 24**. Turning lanes are not proposed for the intersections within the Subject property.

OLD SCHOOL ROAD

KENNEDY ROAD

E.G.P. ROAD

STREET A

STREET B

STREET C

STREET D

STREET E

STREET F

STREET G

STREET H

STREET I

STREET J

STREET K

STREET L

BLOCK 71

BONNIEGLEN FARM BOULEVARD

CIRRUS CRESCENT

REGISTERED PLAN 43M-2017

REGISTERED PLAN 43M-2016

No. 3521

No. 3611

No. 3751

No. 410

EXISTING ONE STOREY BRICK DWELLING BLOCK 4

DIXON'S UNION CEMETERY

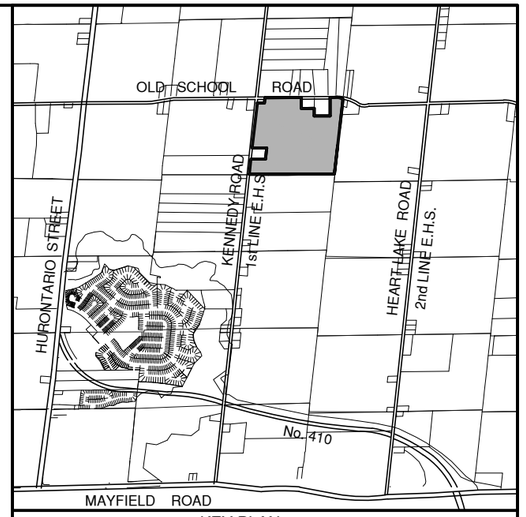
BARN

SMALL BARN

TRCA REGULATION LINE

REGULATORY FLOOD LINE AS PER TRCA HUMBER RIVER SHEET No. 120

TOP OF BANK LINE AS PER MAURO GROUP INC. O.L.S. PROJECT No. 22-B7900-1



KEY PLAN
N.T.S

STOP SIGN

TRENDS DEVELOPMENT INC.
PROPOSED RESIDENTIAL SUBDIVISION

PROPOSED
INTERSECTION TYPES

12909 KENNEDY ROAD
PART OF LOT 22, CONCESSION 2
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL

CANDEVCON GROUP INC.
CONSULTING ENGINEERS AND PLANNERS
9358 GOREWAY DRIVE, BRAMPTON, ONTARIO L6P 0M7
TEL. (905) 794-0600 FAX (905) 794-0611

DATE SEPT. 11th 2024	PROJECT No W22068
DRAWN S.N.	FIGURE No. 24
SCALE 1:1250	

8. SAFETY ASSESSMENT

8.1 Sight Distance Analysis

For vehicles at Street "B" entering Old School Road and for vehicles at Streets "A" and "C" entering or crossing Kennedy Road, the turning sight distances were evaluated using the criteria from the Transportation Association of Canada's Geometric Design Guide for Canadian Roads.[14]

CANDEVCON GROUP INC. conducted a site visit on May 13th, 2024 to determine the sight distances measured in the vertical plane. Pictures taken during the site visit that illustrate the sight distances from the vertical plane are provided in **Appendix I**. In addition, this Study reviewed the sight distances measured in the horizontal plane for Old School Road, which are illustrated in **Figure 25**. Since the horizontal alignment for Kennedy Road within the vicinity of the proposed Residential Subdivision is relatively straight, sight distance measurements for vehicles entering or crossing Kennedy Road were not taken. The findings of the sight distance analysis are summarized in **Table 18**.

Table 18: The Required and Provided Sight Distances

Destined Roadway	Departing from	Turning Maneuver	Sight Distance Required	Sight Distance Provided	
				Vertical	Horizontal
Old School Road	Street 'B'	Making a Left	200m	200m	>200m
	Street 'B'	Making a Right	163m	>200m	
Kennedy Road	Street 'A'	Making a Left	156m	130m	
	Street 'A'	Making a Right	126m	162m	
	Street 'A'	Crossing the Road	146m	130m	
	Street 'C'	Making a Left	156m	>200m	
	Street 'C'	Making a Right	126m	>200m	
	Street 'C'	Crossing the Road	146m	>200m	

Note 1: With a posted speed limit of 70 km/h, the design speed for Old School Road was assumed to be 90 km/h. With a posted speed limit of 60 km/h, the design speed for Kennedy Road was assumed to be 70 km/h.
Note 2: The analysis is based on the 2038 horizon year with the roadways analyzed as four (4) lane roadways.
Note 3: This analysis assumes that the grade at the approach is less than or equal to 3%.

[14] Geometric Design Guide for Canadian Roads, Transportation Association of Canada, June 2017.

SIGHT DISTANCE IS GREATER THAN 200 METRES

SIGHT DISTANCE IS GREATER THAN 200 METRES

OLD SCHOOL ROAD

DECISION POINT (4.4m FROM THE TRAVEL LANE)

KENNEDY ROAD

STREET A

STREET B

STREET C

STREET D

STREET E

STREET F

STREET G

STREET H

STREET I

STREET J

CIRRUS CRESCENT

BONNIEGLEN FARM BOULEVARD

REGISTERED PLAN 43M-2017

REGISTERED PLAN 43M-2016

BLOCK 71

EXISTING ONE STOREY BRICK DWELLING

DIXON'S UNION CEMETERY

TRCA REGULATION LINE

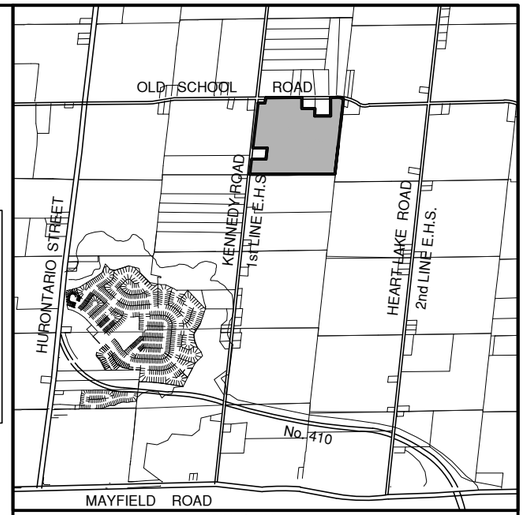
REGULATORY FLOOD LINE AS PER TRCA HUMBER RIVER SHEET No. 120

TOP OF BANK LINE AS PER MAURO GROUP INC. O.L.S. PROJECT No. 22-B7900-1

The Required and Provided Sight Distances

Destined Roadway	Departing from	Turning Maneuver	Sight Distance Required	Sight Distance Provided	
				Vertical	Horizontal
Old School Road	Street 'B'	Making a Left	200m	200m	>200m
	Street 'B'	Making a Right	163m	>200m	
Kennedy Road	Street 'A'	Making a Left	156m	130m	
	Street 'A'	Making a Right	126m	162m	
	Street 'A'	Crossing the Road	146m	130m	
	Street 'C'	Making a Left	156m	>200m	
	Street 'C'	Making a Right	126m	>200m	
	Street 'C'	Crossing the Road	146m	>200m	

Note 1: With a posted speed limit of 70 km/h, the design speed for Old School Road was assumed to be 90 km/h. With a posted speed limit of 60 km/h, the design speed for Kennedy Road was assumed to be 70 km/h.
Note 2: The analysis is based on the 2038 horizon year with the roadways analyzed as four (4) lane roadways.
Note 3: This analysis assumes that the grade at the approach is less than or equal to 3%.



KEY PLAN
N.T.S

TRENDS DEVELOPMENT INC.
PROPOSED RESIDENTIAL SUBDIVISION

HORIZONTAL SIGHT DISTANCE MEASUREMENTS

12909 KENNEDY ROAD
PART OF LOT 22, CONCESSION 2
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL

CANDEVCON GROUP INC.
CONSULTING ENGINEERS AND PLANNERS
9358 GOREWAY DRIVE, BRAMPTON, ONTARIO L6P 0M7
TEL. (905) 794-0600 FAX (905) 794-0611

DATE	SEPT. 20th 2024	PROJECT No	W22068
DRAWN	B.W.	FIGURE No.	25
SCALE	1:1250		

8. SAFETY ASSESSMENT (CONT'D)

8.1 Sight Distance Analysis (Cont'd)

With the exception of vehicles from Street "A" making a left or a through movement at Kennedy Road, the sight distance analysis determined that the sight distances provided meet the sight distance requirements. For the intersection of Street "A"/proposed Collector Road at Kennedy Road, since the sight distances provided for the westbound left and through movements do not meet requirements, traffic signals are recommended. These turning movements can only be made safely with the controls of a traffic signal.

The Future (2038) Total Traffic Conditions with the recommended improvement is summarized in **Table 19**. The related calculations are provided in **Appendix F**. Street "A"/proposed Collector Road at Kennedy Road was analyzed as a semi-actuated uncoordinated signalized intersection with Kennedy Road as the main street. The lane configuration used in the analysis comprises a shared through-left turning lane and a shared through-right turning lane at the northbound and southbound approaches; and a shared left-through-right turning lane at the eastbound and westbound approaches.

Table 19: Future (2038) Total Traffic – with Improvements - Level of Service

Intersection	Turning Movement/ Approach	A.M. Peak Hour				P.M. Peak Hour			
		V/C	LOS	Delay[1]	95% Queue (m)	V/C	LOS	Delay[1]	95% Queue (m)
Street 'A'/ Proposed Collector Road at Kennedy Road (Signalized)	**Overall**	**0.28**	**A**	**5.2**	**n/a**	**0.31**	**A**	**5.9**	**n/a**
	EB Approach	0.24	A	7.3	7.4	0.15	A	4.2	4.0
	WB Approach	0.05	A	0.2	0.2	0.31	A	8.9	10.5
	NB Approach	0.14	A	4.8	11.1	0.29	A	5.9	24.8
	SB Approach	0.28	A	5.3	22.8	0.19	A	5.2	14.7

Note 1: Delays are measured in seconds per vehicle.

The Future (2038) Total Traffic Analysis indicates that all of the turning movements will operate at a Level of Service "A" during the A.M. and P.M. Peak Hours.

8. SAFETY ASSESSMENT (CONT'D)

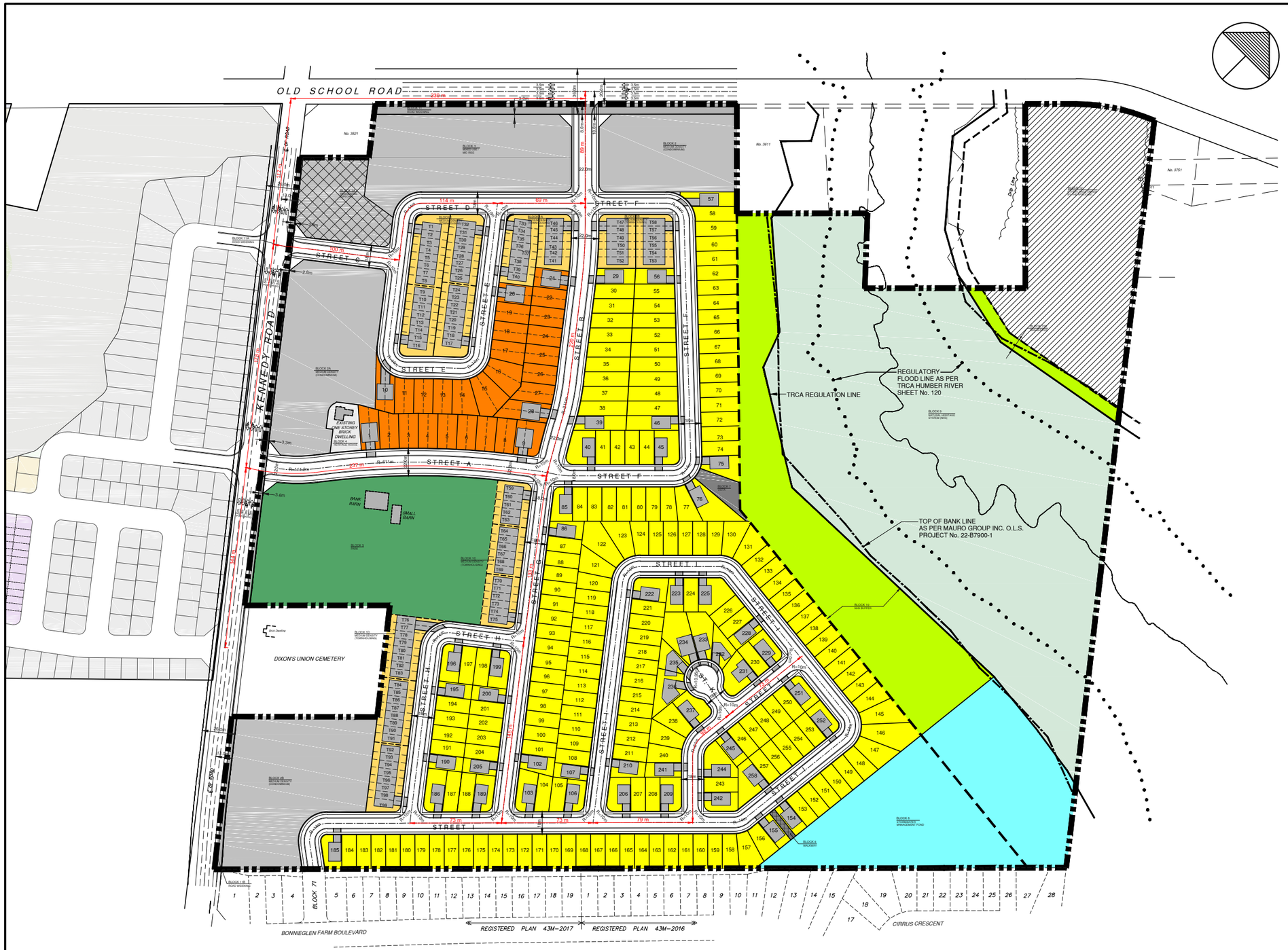
8.2 Intersection Spacing

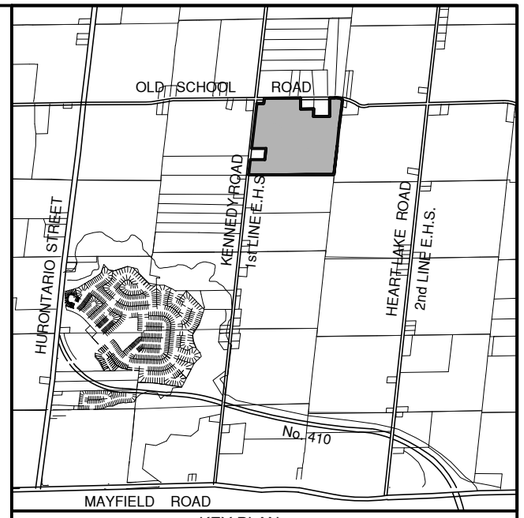
As per the criteria from the Transportation Association of Canada's (TAC) Geometric Design Guide for Canadian Roads, the minimum spacing requirements for intersections are provided below:

- Arterial Roads – 200m
- Collector Roads – 60m
- Local Roads – 60m for four-legged intersections and 40 metres for three-legged intersections.

Based on the findings in **Figure 26,** the distances between intersections that run along local and collector roads are greater than 60 metres, which exceeds the minimum spacing requirements that are established by TAC.

The distance between the Old School Road at Kennedy Road and Street 'C'/Proposed Local Road at Kennedy Road intersections, the distance between the Street 'C'/Proposed Local Road at Kennedy Road and Street 'A'/Proposed Collector Road at Kennedy Road intersections and the distance between the Street 'A'/Proposed Collector Road at Kennedy Road and the intersection to the south that is part of the proposed development to the west is less than the 200 metres required for an arterial road. However, the concern with the spacing of intersections revolves around the performance of traffic operations. Based on the Future (2033 & 2038) Total Traffic Analysis, the concerned intersections will operate at acceptable Levels of Service.





KEY PLAN
N.T.S

TRENDS DEVELOPMENT INC.
PROPOSED RESIDENTIAL SUBDIVISION

INTERSECTION SPACING MEASUREMENTS

12909 KENNEDY ROAD
PART OF LOT 22, CONCESSION 2
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL

CANDEVCON GROUP INC.
CONSULTING ENGINEERS AND PLANNERS
9358 GOREWAY DRIVE BRAMPTON, ONTARIO L6P 0M7
TEL. (905) 794-0600 FAX (905) 794-0611

DATE SEPT. 11th 2024	PROJECT No W22068
DRAWN S.N.	FIGURE No. 26
SCALE 1:1250	

9. TRANSIT AND ACTIVE TRANSPORTATION CONSIDERATIONS

9.1 Future Transit Network

Within the vicinity of the proposed Residential Subdivision, as per the 2019 Transit Feasibility Study, future transit corridors will be provided on Kennedy Road and Old School Road by 2035.

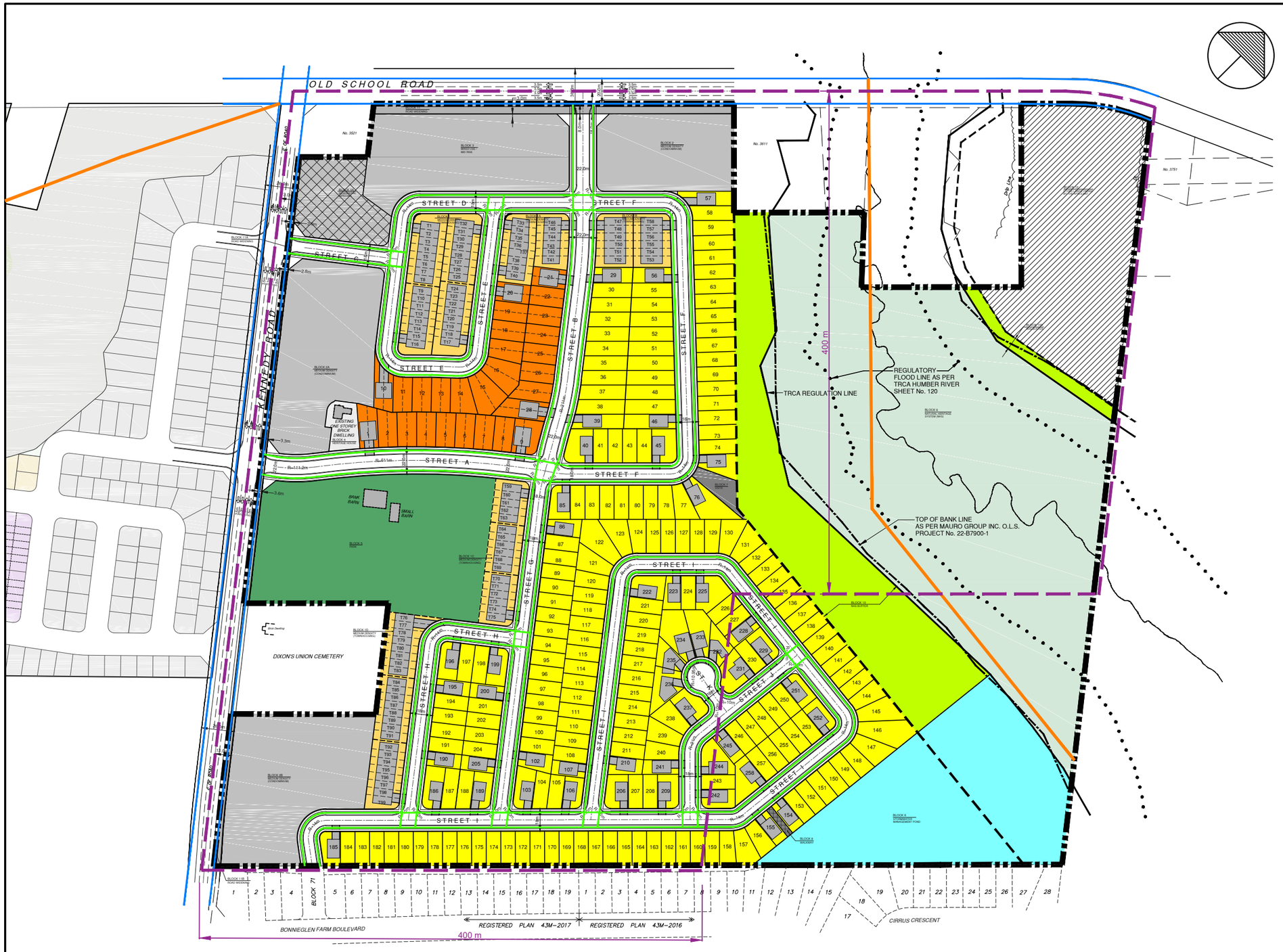
The Transportation Demand Management Plan illustrated in **Figure 27** demonstrates that the majority of the land uses within the proposed Residential Subdivision will be within 400 metres of a future transit corridor and that all of the land uses will be within 800 metres of a future transit corridor. Among municipalities, the maximum distance for transit accessibility ranges from 400 metres to 800 metres. In addition, the land uses within the proposed Residential Subdivision will have a connection with the future transit corridors that is continuous.

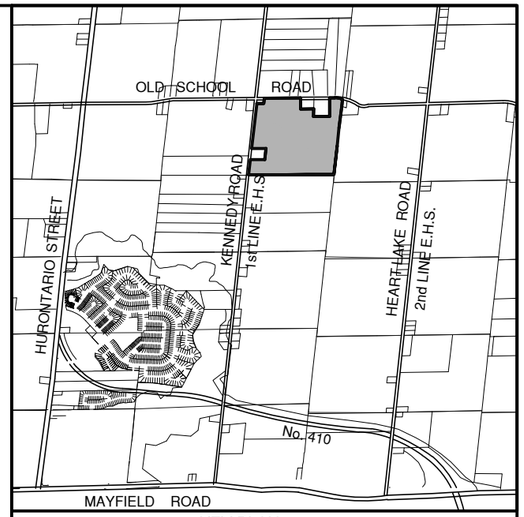
9.2 Future Cycling Network

For Kennedy Road and Old School Road, within the Study Area, the construction of multi-use paths are anticipated with a multi-use path provided on both sides of Kennedy Road. It is assumed that these improvements will be constructed concurrently with the anticipated widening; with the widening of Kennedy Road by 2031 and the widening of Old School Road by 2041.

In addition, the proposed Residential Subdivision is within the vicinity of two (2) proposed multi-use trails; with a multi-use trail that has a north connection with the southwest corner of the Kennedy Road at Old School Road intersection and a multi-use trail that runs along the tributary to the Humber River and across Old School Road. The Town of Caledon's Active Transportation Master Plan provides the future network of multi-use trails and is provided in **Appendix J**.

The Transportation Demand Management Plan in **Figure 27** illustrates the proposed cycling network. Although the roads within the proposed Residential Subdivision will provide a pedestrian sidewalk on both sides, the roadways can be shared between motorists and cyclists. For Blocks 2, 2A, 2B, 3 and 3A and the proposed park, connections with the multi-use paths on Kennedy Road and Old School Road will be explored at the site plan stage.





KEY PLAN
N.T.S

LEGEND

- PEDESTRIAN SIDEWALK
- MULTI-USE PATH
- MULTI-USE TRAIL
- AREA ACCESSIBLE TO TRANSIT

TRENDS DEVELOPMENT INC.
PROPOSED RESIDENTIAL SUBDIVISION

TRANSPORTATION DEMAND MANAGEMENT PLAN

12909 KENNEDY ROAD
PART OF LOT 22, CONCESSION 2
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL

CANDEVCON GROUP INC.
CONSULTING ENGINEERS AND PLANNERS
9358 GOREWAY DRIVE BRAMPTON, ONTARIO L6P 0M7
TEL. (905) 794-0600 FAX (905) 794-0611

DATE SEPT. 12th 2024	PROJECT No W22068
DRAWN S.N.	FIGURE No. 27
SCALE 1:1250	

9. TRANSIT AND ACTIVE TRANSPORTATION CONSIDERATIONS (CONT'D)

9.3 Future Pedestrian Network

The roadways within the proposed Residential Subdivision comprise of pedestrian sidewalks on both sides, which will connect with the multi-use paths on Kennedy Road and Old School Road and the multi-use trail system. For Blocks 2, 2A, 2B, 3 and 3A and the proposed park, connections with the external network will be explored at the site plan stage. Internally, pedestrian walkways for Blocks 2, 2A, 2B, 3 and 3A and the proposed park should be continuous and should be connected to all of the dwelling units and commercial units.

9.4 Transportation Demand Management Strategies

The transit and active transportation facilities proposed by the Town and the Subject Subdivision provide a continuous network that will encourage modes of transportation that are sustainable. To encourage sustainable transportation modes even further, for Blocks 2, 2A, 2B, 3 and 3A and the park, pedestrian walkways that provide a strong level of accessibility will be explored and the requirements for bicycle parking will be adhered to. In addition, campaigns that inform the public of the sustainable transportation options available can be implemented.

10. SUMMARY

The proposed Residential Subdivision is expected to generate a total of 242 net trips during the A.M. Peak Hour (62 inbound trips and 180 outbound trips) and 312 net trips during the P.M. Peak Hour (196 inbound trips and 116 outbound trips). With the inclusion of site-generated traffic, impacts to the concerned intersections will be low.

Street 'A' and Street 'C' will align with a road provided by the proposed Developments that are owned by Argo Kennedy Limited and connect with Kennedy Road to form a four-legged intersection. Street 'B' will connect with Old School Road to form a T-intersection. In addition, Street 'I' will extend immediately south of the Subject Property to connect with Bonnieglen Farm Boulevard to form a T-intersection.

For the 2033 interim year, between Newhouse Boulevard and Old School Road, it is anticipated that Kennedy Road will be widened to four (4) lanes and urbanized.

For the intersections that were a part of the traffic operations analysis, the following recommendations should be considered for the 2033 interim year:

Old School Road at Kennedy Road

- Adjust the signal timing plans to accommodate for the anticipated road widening of Kennedy Road.

Street "A"/proposed Collector Road at Kennedy Road

- Signalization (to satisfy sight distance concerns).

Street 'C'/Proposed Local Road at Kennedy Road

- Stop-control at the eastbound and westbound approaches.

Street 'B' at Old School Road

- Stop-control at the northbound approach.

With the recommended improvements, all of the intersections will operate at an acceptable Levels of Service during the A.M. and P.M. Peak Hours.

10. SUMMARY (CONT'D)

A traffic safety assessment was summarized in this Study. Although Street "A"/proposed Collector Road at Kennedy Road will operate at an acceptable Levels of Service as an un-signalized intersection, vehicles from Street "A" making a left or a through movement at Kennedy Road will not have a sightline in the vertical plane that meets requirements. As a result, signalization is recommended, resulting in these turning movements being given the right of way. The Draft Plan of Subdivision does not present any other concerns to traffic safety.

By 2041, between Winston Churchill Boulevard and Airport Road, it is anticipated that Old School Road will be widened to four (4) lanes and urbanized. This Study assumed that these improvements will be completed by the 2038 horizon year. Unlike the conditions that are presented to Kennedy Road, the ROW width for Old School Road allows for the construction of left-turn lanes. As a result, left-turn lanes for the eastbound and westbound approaches are being recommended for the Old School Road at Kennedy Road intersection since they are warranted during the A.M. and P.M. Peak Hours for the Future (2038) Total Background Traffic scenario.

For the intersections that were a part of the traffic operations analysis, the following recommendations could be considered for the 2038 horizon year:

Old School Road at Kennedy Road

- Adjust the signal timing plans to accommodate for the anticipated road widening of Old School Road.
- Construct a left turning lane with 35 metres of storage at the eastbound approach,
- Construct a left turning lane with 20 metres of storage at the westbound approach.

With the recommended improvements, all of the intersections will operate at an acceptable Levels of Service during the A.M. and P.M. Peak Hours. Due to background traffic, the storage lengths that are recommended for the left-turn lanes at the eastbound and westbound approaches exceed the minimum requirements.

In addition, as illustrated in the Transportation Demand Management Plan in **Figure 27**, the transit and active transportation facilities proposed by the Town and the Subject Subdivision provide a continuous network that will encourage modes of transportation that are sustainable.

10. SUMMARY (CONT'D)

Based on the analysis outlined in the Study, with the recommendations given, the key intersections will operate at acceptable levels of service during the Weekday A.M. and P.M. Peak Hours under the 2033 interim year and the 2038 horizon year. Impacts from the trips generated by the proposed Residential Subdivision are low.

This Report was prepared by:

CANDEVCON GROUP INC.

Brian Wong, P. Eng.
Intermediate Transportation Engineer

David Lee, P. Eng.
Project Manager

APPENDIX A

TERMS OF REFERENCE

Traffic Impact Study – Terms of Reference

a) Assemble, review and confirm background data (i.e. traffic volume/flow on the adjacent road network during weekday peak hours) available from official sources, existing road geometry and access location.

b) Conduct turning movement counts (if necessary) at the Old School Road at Kennedy Road and Bonnieglen Farm Boulevard/Newhouse Boulevard at Kennedy Road intersections during Weekday AM and Weekday PM Peak Hours.

c) Establish existing traffic patterns and historic travel growth rates for the study area.

d) Consult with the Town of Caledon to confirm data as required (i.e. growth trends, other proposed development timing etc.), issues/developments to be addressed and any anticipated future road improvements.

e) Assess future trips generated by the Proposed Residential Subdivision during Weekday AM and Weekday PM Peak Hours.

f) Develop the trip distribution and traffic assignment for the Proposed Residential Subdivision during Weekday AM and Weekday PM Peak Hours.

g) Establish the five (5) year time horizon post build-out of the Proposed Residential Subdivision to forecast future peak periods of street traffic.

h) Analyze the traffic operations during peak periods at the following key site access points. (To be confirmed with the Town of Caledon)

- Old School Road at Kennedy Road,
- Bonnieglen Farm Boulevard/Newhouse Boulevard at Kennedy Road,
- Proposed Local Road (Street ‘A’)/Proposed Local Road at Kennedy Road,
- Proposed Local Road (Street ‘C’)/Proposed Local Road at Kennedy Road,
- Proposed Local Road (Street ‘B’) at Old School Road.

i) Complete traffic operations and volume-capacity analyses using the Synchro 9.0 software.

j) Assess existing and future total background and total traffic operations (five (5) year post horizon) at the proposed key access points mentioned above.

k) Identify existing and/or future active transportation and transit facilities within the vicinity of the Proposed Residential Subdivision and recommend on-site strategies for transportation demand management.

Traffic Impact Study – Terms of Reference (Cont'd)

l) Prepare a Study to summarize the findings of the traffic impact analyses, as well as recommend any improvements required to mitigate the traffic impacts. Submit Study to the Town of Caledon for review/comments.

m) Provide and circulate copies of the Study to all applicable approval authorities (first submission only).

Brian Wong

From: Kavleen Younan <Kavleen.Younan@caledon.ca>
Sent: April-04-24 3:36 PM
To: Brian Wong
Cc: David Lee; Filing West
Subject: FW: W22068 - PRE 2023-0305 - Trend Kennedy - Traffic Impact Study Terms of Reference (Town of Caledon)
Attachments: Traffic Data.xlsx; map traffic data.pdf

Hi Brian,

Town Transportation Engineering Staff have reviewed the submitted Terms of Reference and offer the following comments:

1. Traffic counts:
   - Should the applicant desire to purchase TMC counts, please reach out to Smit.Patel@caledon.ca to confirm availability.
   - Any collected traffic data should reflect typical conditions (e.g., avoid school closures and winter storms). We also ask applicants to avoid collecting data during construction.
   - Please see attached for historical Average Daily Traffic (ADT) data.
2. Background developments:
   - The latest publicly available transportation study (for POPA 2021-0009) is BA Group dated August 2023. Please note that the Official Plan Amendment is under review, and the supporting studies may be updated.
   - The following background developments were also identified and available; the transportation studies have been linked as required. To assist in a speedy review, kindly append transportation study excerpts and separate figures for each background development.
     - POPA 2021-0009
     - 0 Dougal Road [12530, 12540, 12550, and 12560 Kennedy Road]
     - 0 Kennedy Road (Unoccupied units of Buttermill Developments Inc. 21CDM-21003C and 21CDM-21-21002C)
3. Future road improvements:
   - Recommended improvements as noted as part of POPA 2021-0009
   - Recommendations as noted in the Current/Draft Official Plans, Current/Draft Transportation Master Plans, and the Draft Active Transportation Master Plan
4. Trip Generation:
   - Please ensure that trips from the Mixed Use units are accounted for as part of the analysis
   - Reference should be made to previous reports investigating this site.
5. Horizon years:
   - Given the scale of the proposed development, please include a 10-year time horizon to remain consistent with previous studies and industry best practices.
6. Study intersections:
   - Please include the assessment of the operations of internal intersections, especially those expected to observe higher traffic volumes. This includes, but is not limited to, the intersection of Street A and Street B. Appropriate traffic control for these intersections should be recommended.
   - For the lower volume internal intersections, a qualitative discussion of the anticipated operations is sufficient.
7. Please ensure that a Pedestrian Circulation Plan is provided. The plan should:
   - Demonstrate how the site will be connected to existing facilities through active transportation.
   - Identify appropriate pavement markings and signage for all pedestrians and cyclists

- Bike Parking locations
- Any Additional proposed pedestrian, cycling, and trail facilities or amenities
- Review pedestrian lines of desire at intersections expected to experience higher vehicular and pedestrian volumes. Recommend crossing treatments that follow OTM Book 15 as required. Intersections of interest include, but are not limited to, the intersection of Street A and Kennedy Road.

8. Parking:
   - If not completed, an on-street parking plan should be provided.
   - If fewer than the required parking spaces are being provided, a parking justification study may be required. The transportation consultant on file should circulate a scope of work to Town Staff for review prior to submitting a report.
9. The study should include a review of safety considerations, including sight distance assessments at the proposed access location, minimum roadway spacing, and corner clearance of public roadways. The consultant should confirm that the proposal follows the recommendations in TAC GHDCR.
10. An AutoTURN assessment should be provided.
11. Given the proposed development's location, a TOR should be circulated with the MTO and Region to provide additional insight as required.
12. The Appendix must contain all data, calculations, and assumptions not included in the main body of the report. This includes, but is not limited to, Institute of Transportation Engineers Trip Generation Rates, Transportation Tomorrow Survey data, Synchro Analysis Reports, Etc.

Feel free to reach out if there are any questions,
Thanks

Regards,

Kavleen S. Younan, P.Eng.
Transportation Engineer
Engineering, Public Works & Transportation Department

Upcoming Vacation Alert: I will be away from April 8th 2024, until April 16th, 2024

Email: kavleen.younan@caledon.ca
Town of Caledon | www.caledon.ca | www.visitcaledon.ca | Follow us @TownofCaledon

---

From: Brian Wong <brian@candevcon.com>
Sent: Thursday, March 28, 2024 9:17 AM
To: Kavleen Younan <Kavleen.Younan@caledon.ca>

Cc: David Lee <david@candevcon.com>; Filing West <filingwest@candevcon.com>
Subject: W22068 - PRE 2023-0305 - Trend Kennedy - Traffic Impact Study Terms of Reference (Town of Caledon)

Good Morning Kavleen,

We are preparing a Traffic Impact Study for a proposed Residential Subdivision (PRE 2023-0305) that is immediately east of Kennedy Road and south of Old School Road. Please find the Terms of Reference and the latest Preliminary Development Plan attached for your review and comment.

If you require any further information, please do not hesitate to contact me.

Brian Wong, P.Eng.

Intermediate Transportation Engineer

CANDEVCON GROUP INC.
CONSULTING ENGINEERS & PLANNERS
GTA WEST OFFICE (CORPORATE)
9358 Goreway Drive, Brampton, Ontario, L6P 0M7
Tel.: (905)794-0600 Ext 2059

APPENDIX B

TURNING MOVEMENT COUNTS

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Project #24-186 - Candevcon Group Inc.

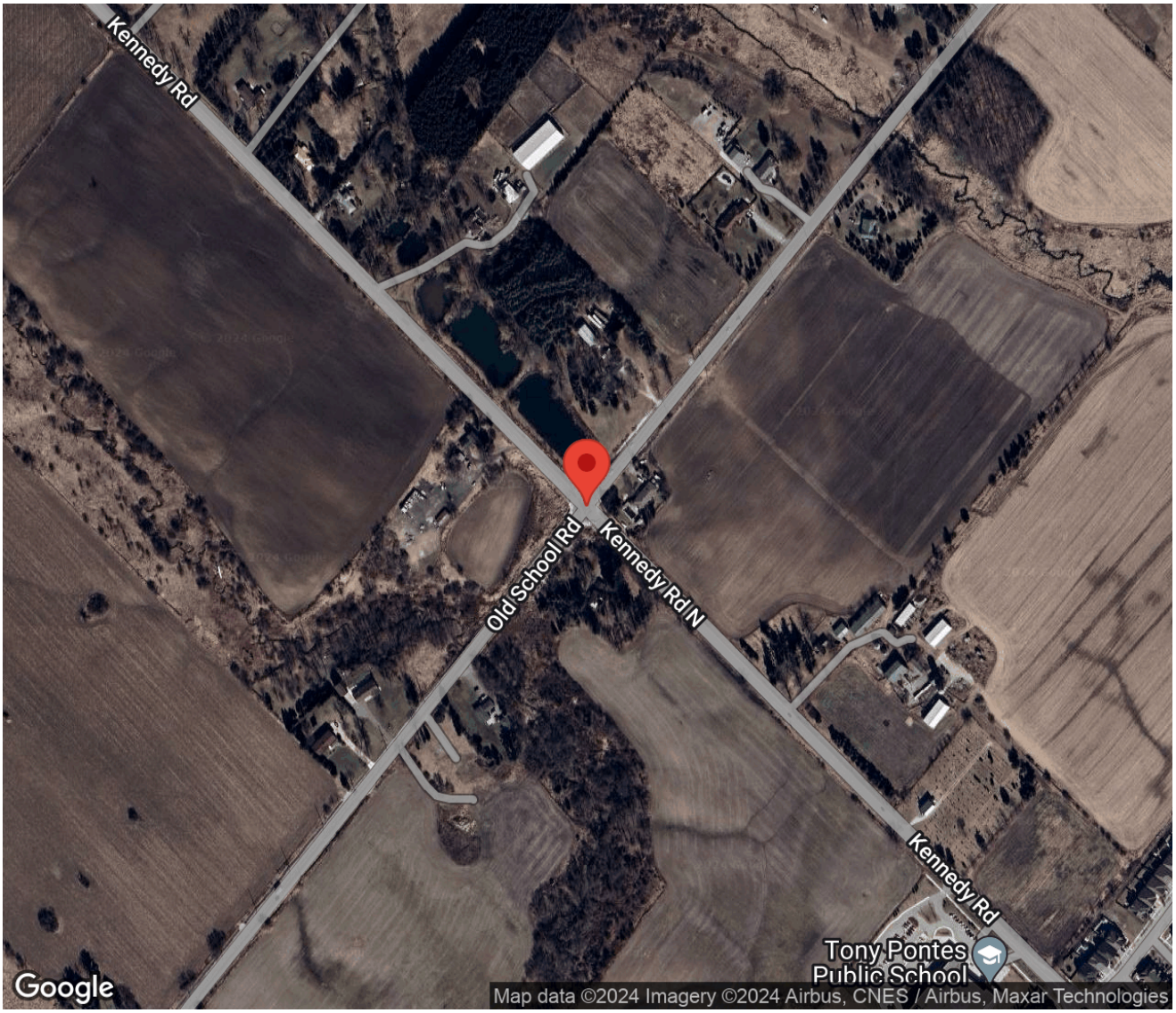
Intersection Count Report

Intersection:	Old School Rd & Kennedy Rd
Municipality:	Caledon
Count Date:	Wednesday, May 08, 2024
Site Code:	2418600001
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	07:00-09:00, 16:00-18:00
Weather:	Clear
Comments:	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Map

Intersection:	Old School Rd & Kennedy Rd
Site Code:	2418600001
Municipality:	Caledon
Count Date:	May 08, 2024



Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	Old School Rd & Kennedy Rd
Site Code:	2418600001
Municipality:	Caledon
Count Date:	May 08, 2024

Kennedy Rd - 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	4	188	73	0	265	0	48	87	3	0	138	0	403
08:00 - 09:00	16	141	129	0	286	0	86	87	9	0	182	0	468
BREAK													
16:00 - 17:00	15	117	162	0	294	0	166	226	13	0	405	0	699
17:00 - 18:00	12	123	208	0	343	0	188	247	7	0	442	0	785
GRAND TOTAL	**47**	**569**	**572**	**0**	**1188**	**0**	**488**	**647**	**32**	**0**	**1167**	**0**	**2355**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	Old School Rd & Kennedy Rd
Site Code:	2418600001
Municipality:	Caledon
Count Date:	May 08, 2024

Old School Rd - Traffic Summary

	East Approach Totals						West Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
07:00 - 08:00	11	56	7	0	74	1	123	33	189	0	345	0	419
08:00 - 09:00	14	40	13	0	67	0	147	36	203	0	386	0	453
BREAK													
16:00 - 17:00	8	51	10	0	69	0	116	45	94	0	255	0	324
17:00 - 18:00	9	50	9	0	68	0	117	58	95	0	270	0	338
GRAND TOTAL	**42**	**197**	**39**	**0**	**278**	**1**	**503**	**172**	**581**	**0**	**1256**	**0**	**1534**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Old School Rd & Kennedy Rd
Site Code: 2418600001
Municipality: Caledon
Count Date: May 08, 2024

North Approach - Kennedy Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
07:00	0	38	0	0	38	0	0	1	0	1	0	0	0	0	0	0
07:15	0	37	14	0	51	2	4	7	0	13	0	0	0	0	0	0
07:30	0	50	23	0	73	0	3	2	0	5	0	0	0	0	0	0
07:45	2	56	25	0	83	0	0	1	0	1	0	0	0	0	0	0
08:00	5	37	40	0	82	1	0	1	0	2	0	0	0	0	0	0
08:15	0	40	36	0	76	0	1	2	0	3	0	0	0	0	0	0
08:30	2	29	27	0	58	1	4	3	0	8	0	0	0	0	0	0
08:45	3	29	20	0	52	4	1	0	0	5	0	0	0	0	0	0
SUBTOTAL	12	316	185	0	513	8	13	17	0	38	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Old School Rd & Kennedy Rd
Site Code: 2418600001
Municipality: Caledon
Count Date: May 08, 2024

North Approach - Kennedy Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
16:00	7	30	35	0	72	0	0	0	0	0	0	0	0	0	0	0
16:15	1	23	37	0	61	0	5	1	0	6	0	0	0	0	0	0
16:30	3	30	44	0	77	0	2	1	0	3	0	0	0	0	0	0
16:45	4	27	42	0	73	0	0	2	0	2	0	0	0	0	0	0
17:00	2	35	39	0	76	0	3	0	0	3	0	0	0	0	0	0
17:15	4	23	56	0	83	0	0	1	0	1	0	0	0	0	0	0
17:30	2	34	57	0	93	0	0	1	0	1	0	0	0	0	0	0
17:45	4	28	54	0	86	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	27	230	364	0	621	0	10	6	0	16	0	0	0	0	0	0
GRAND TOTAL	**39**	**546**	**549**	**0**	**1134**	**8**	**23**	**23**	**0**	**54**	**0**	**0**	**0**	**0**	**0**	**0**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Old School Rd & Kennedy Rd
Site Code: 2418600001
Municipality: Caledon
Count Date: May 08, 2024

South Approach - Kennedy Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
07:00	10	12	0	0	22	0	1	0	0	1	0	0	0	0	0	0
07:15	11	17	0	0	28	2	3	0	0	5	0	0	0	0	0	0
07:30	10	22	1	0	33	1	1	0	0	2	0	0	0	0	0	0
07:45	14	29	1	0	44	0	2	1	0	3	0	0	0	0	0	0
08:00	32	27	0	0	59	0	3	0	0	3	0	0	0	0	0	0
08:15	24	16	2	0	42	1	1	0	0	2	0	0	0	0	0	0
08:30	12	21	2	0	35	2	1	1	0	4	0	0	0	0	0	0
08:45	13	16	3	0	32	2	2	1	0	5	0	0	0	0	0	0
SUBTOTAL	126	160	9	0	295	8	14	3	0	25	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Old School Rd & Kennedy Rd
Site Code: 2418600001
Municipality: Caledon
Count Date: May 08, 2024

South Approach - Kennedy Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
16:00	41	49	5	0	95	0	1	0	0	1	0	0	0	0	0	0
16:15	35	57	3	0	95	1	1	0	0	2	0	0	0	0	0	0
16:30	37	54	3	0	94	1	0	0	0	1	0	0	0	0	0	0
16:45	50	62	2	0	114	1	2	0	0	3	0	0	0	0	0	0
17:00	50	58	1	0	109	0	0	0	0	0	0	0	0	0	0	0
17:15	47	69	3	0	119	0	0	0	0	0	0	0	0	0	0	0
17:30	47	62	2	0	111	0	0	0	0	0	0	0	0	0	0	0
17:45	44	58	1	0	103	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	351	469	20	0	840	3	4	0	0	7	0	0	0	0	0	0
GRAND TOTAL	**477**	**629**	**29**	**0**	**1135**	**11**	**18**	**3**	**0**	**32**	**0**	**0**	**0**	**0**	**0**	**0**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Old School Rd & Kennedy Rd
Site Code: 2418600001
Municipality: Caledon
Count Date: May 08, 2024

East Approach - Old School Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
					Total					Total					Total	
07:00	3	8	2	0	13	0	0	0	0	0	0	0	0	0	0	0
07:15	2	7	2	0	11	0	1	0	0	1	0	0	0	0	0	0
07:30	3	10	0	0	13	1	2	0	0	3	0	0	0	0	0	1
07:45	2	24	3	0	29	0	4	0	0	4	0	0	0	0	0	0
08:00	7	14	5	0	26	0	0	0	0	0	0	0	0	0	0	0
08:15	2	8	1	0	11	1	0	0	0	1	0	0	0	0	0	0
08:30	2	7	4	0	13	0	0	0	0	0	0	0	0	0	0	0
08:45	2	10	3	0	15	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	23	88	20	0	131	2	8	0	0	10	0	0	0	0	0	1

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Old School Rd & Kennedy Rd
Site Code: 2418600001
Municipality: Caledon
Count Date: May 08, 2024

East Approach - Old School Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
16:00	2	10	2	0	14	0	2	0	0	2	0	0	0	0	0	0
16:15	0	15	3	0	18	0	2	0	0	2	0	0	0	0	0	0
16:30	3	12	3	0	18	0	0	0	0	0	0	0	0	0	0	0
16:45	3	10	2	0	15	0	0	0	0	0	0	0	0	0	0	0
17:00	2	9	3	0	14	0	0	0	0	0	0	0	0	0	0	0
17:15	1	16	4	0	21	0	0	0	0	0	0	0	0	0	0	0
17:30	3	10	0	0	13	0	0	0	0	0	0	0	0	0	0	0
17:45	3	15	2	0	20	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	17	97	19	0	133	0	4	0	0	4	0	0	0	0	0	0
GRAND TOTAL	40	185	39	0	264	2	12	0	0	14	0	0	0	0	0	1

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Old School Rd & Kennedy Rd
Site Code: 2418600001
Municipality: Caledon
Count Date: May 08, 2024

West Approach - Old School Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
					Total					Total					Total	
07:00	23	3	26	0	52	2	0	0	0	2	0	0	0	0	0	0
07:15	31	9	41	0	81	0	1	5	0	6	0	0	0	0	0	0
07:30	30	11	49	0	90	1	1	5	0	7	0	0	0	0	0	0
07:45	35	8	63	0	106	1	0	0	0	1	0	0	0	0	0	0
08:00	33	9	56	0	98	5	0	1	0	6	0	0	0	0	0	0
08:15	32	11	60	0	103	1	0	0	0	1	0	0	0	0	0	0
08:30	46	8	51	0	105	2	0	1	0	3	0	0	0	0	0	0
08:45	27	8	34	0	69	1	0	0	0	1	0	0	0	0	0	0
SUBTOTAL	257	67	380	0	704	13	2	12	0	27	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Old School Rd & Kennedy Rd
Site Code: 2418600001
Municipality: Caledon
Count Date: May 08, 2024

West Approach - Old School Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
					Total					Total					Total	
16:00	25	9	15	0	49	0	0	2	0	2	0	0	0	0	0	0
16:15	32	12	22	0	66	0	2	0	0	2	0	0	0	0	0	0
16:30	33	15	29	0	77	1	0	1	0	2	0	0	0	0	0	0
16:45	24	7	25	0	56	1	0	0	0	1	0	0	0	0	0	0
17:00	34	21	28	0	83	1	0	0	0	1	0	0	0	0	0	0
17:15	36	7	21	0	64	0	0	0	0	0	0	0	0	0	0	0
17:30	22	17	26	0	65	0	0	0	0	0	0	0	0	0	0	0
17:45	24	12	19	0	55	0	1	1	0	2	0	0	0	0	0	0
SUBTOTAL	230	100	185	0	515	3	3	4	0	10	0	0	0	0	0	0
GRAND TOTAL	487	167	565	0	1219	16	5	16	0	37	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	07:00:00	From:	07:30:00
To:	09:00:00	To:	08:30:00

Intersection: Old School Rd & Kennedy Rd
Site Code: 2418600001
Count Date: May 08, 2024

Weather conditions: Clear

**** Signalized Intersection ****

Major Road: Kennedy Rd runs N/S

North Approach

	Out	In	Total
Cars	314	233	547
Trucks	11	15	26
Bicycles	0	0	0
	325	**248**	**573**

Kennedy Rd

Bicycles	0	0	0	0
Trucks	6	4	1	0
Cars	124	183	7	0
Totals	**130**	**187**	**8**	**0**

Peds: 0

East Approach

	Out	In	Total
Cars	79	50	129
Trucks	8	3	11
Bicycles	0	0	0
	87	**53**	**140**

Old School Rd

Bicycles	Trucks	Cars	Totals	
0	0	0	**0**	
0	8	130	**138**	
0	1	39	**40**	
0	6	228	**234**	

Peds: 0

Peds: 1

Old School Rd

	Totals	Cars	Trucks	Bicycles
	0	0	0	0
	9	9	0	0
	62	56	6	0
	16	14	2	0

Peds: 0

West Approach

	Out	In	Total
Cars	397	260	657
Trucks	15	14	29
Bicycles	0	0	0
	412	**274**	**686**

Totals	**82**	**101**	**5**	**0**
Cars	80	94	4	0
Trucks	2	7	1	0
Bicycles	0	0	0	0

Kennedy Rd

South Approach

	Out	In	Total
Cars	178	425	603
Trucks	10	12	22
Bicycles	0	0	0
	188	**437**	**625**

Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: Old School Rd & Kennedy Rd
Site Code: 2418600001
Count Date: May 08, 2024
Period: 07:00 - 09:00

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

Start Time	North Approach Kennedy Rd						South Approach Kennedy Rd						East Approach Old School Rd						West Approach Old School Rd						Total Vehicles
					Peds	Total					Peds	Total					Peds	Total					Peds	Total	
07:30	0	53	25	0	0	78	11	23	1	0	0	35	4	12	0	0	1	16	31	12	54	0	0	97	226
07:45	2	56	26	0	0	84	14	31	2	0	0	47	2	28	3	0	0	33	36	8	63	0	0	107	271
08:00	6	37	41	0	0	84	32	30	0	0	0	62	7	14	5	0	0	26	38	9	57	0	0	104	276
08:15	0	41	38	0	0	79	25	17	2	0	0	44	3	8	1	0	0	12	33	11	60	0	0	104	239
Grand Total	**8**	**187**	**130**	**0**	**0**	**325**	**82**	**101**	**5**	**0**	**0**	**188**	**16**	**62**	**9**	**0**	**1**	**87**	**138**	**40**	**234**	**0**	**0**	**412**	**1012**
Approach %	2.5	57.5	40	0		-	43.6	53.7	2.7	0		-	18.4	71.3	10.3	0		-	33.5	9.7	56.8	0		-	
Totals %	0.8	18.5	12.8	0		32.1	8.1	10	0.5	0		18.6	1.6	6.1	0.9	0		8.6	13.6	4	23.1	0		40.7	
PHF	**0.33**	**0.83**	**0.79**	**0**		**0.97**	**0.64**	**0.81**	**0.63**	**0**		**0.76**	**0.57**	**0.55**	**0.45**	**0**		**0.66**	**0.91**	**0.83**	**0.93**	**0**		**0.96**	**0.92**
Cars	7	183	124	0		314	80	94	4	0		178	14	56	9	0		79	130	39	228	0		397	968
% Cars	87.5	97.9	95.4	0		96.6	97.6	93.1	80	0		94.7	87.5	90.3	100	0		90.8	94.2	97.5	97.4	0		96.4	95.7
Trucks	1	4	6	0		11	2	7	1	0		10	2	6	0	0		8	8	1	6	0		15	44
% Trucks	12.5	2.1	4.6	0		3.4	2.4	6.9	20	0		5.3	12.5	9.7	0	0		9.2	5.8	2.5	2.6	0		3.6	4.3
Bicycles	0	0	0	0		0	0	0	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		0	0	0	0	0		0	0
Peds					0	-					0	-					1	-					0	-	1
% Peds					0	-					0	-					100	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

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

Intersection: Old School Rd & Kennedy Rd
Site Code: 2418600001
Count Date: May 08, 2024

Weather conditions: Clear

**** Signalized Intersection ****

Major Road: Kennedy Rd runs N/S

North Approach

	Out	In	Total
Cars	338	372	710
Trucks	5	1	6
Bicycles	0	0	0
	343	**373**	**716**

Kennedy Rd

Bicycles	0	0	0	0
Trucks	2	3	0	0
Cars	206	120	12	0
Totals	**208**	**123**	**12**	**0**

East Approach

	Out	In	Total
Cars	68	76	144
Trucks	0	1	1
Bicycles	0	0	0
	68	**77**	**145**

Peds: 0

Old School Rd

Bicycles	Trucks	Cars	Totals
0	0	0	**0**
0	1	116	**117**
0	1	57	**58**
0	1	94	**95**

Peds: 0

Peds: 0

Old School Rd

	Totals	Cars	Trucks	Bicycles
	0	0	0	0
	9	9	0	0
	50	50	0	0
	9	9	0	0

Peds: 0

West Approach

	Out	In	Total
Cars	267	444	711
Trucks	3	2	5
Bicycles	0	0	0
	270	**446**	**716**

Kennedy Rd

Totals	**188**	**247**	**7**	**0**
Cars	188	247	7	0
Trucks	0	0	0	0
Bicycles	0	0	0	0

South Approach

	Out	In	Total
Cars	442	223	665
Trucks	0	4	4
Bicycles	0	0	0
	442	**227**	**669**

Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: Old School Rd & Kennedy Rd
Site Code: 2418600001
Count Date: May 08, 2024
Period: 16:00 - 18:00

Peak Hour Data (17:00 - 18:00)

Start Time	North Approach Kennedy Rd						South Approach Kennedy Rd						East Approach Old School Rd						West Approach Old School Rd						Total Vehicles
					Peds	Total					Peds	Total					Peds	Total					Peds	Total	
17:00	2	38	39	0	0	79	50	58	1	0	0	109	2	9	3	0	0	14	35	21	28	0	0	84	286
17:15	4	23	57	0	0	84	47	69	3	0	0	119	1	16	4	0	0	21	36	7	21	0	0	64	288
17:30	2	34	58	0	0	94	47	62	2	0	0	111	3	10	0	0	0	13	22	17	26	0	0	65	283
17:45	4	28	54	0	0	86	44	58	1	0	0	103	3	15	2	0	0	20	24	13	20	0	0	57	266
Grand Total	**12**	**123**	**208**	**0**	**0**	**343**	**188**	**247**	**7**	**0**	**0**	**442**	**9**	**50**	**9**	**0**	**0**	**68**	**117**	**58**	**95**	**0**	**0**	**270**	**1123**
Approach %	3.5	35.9	60.6	0		-	42.5	55.9	1.6	0		-	13.2	73.5	13.2	0		-	43.3	21.5	35.2	0		-	
Totals %	1.1	11	18.5	0		30.5	16.7	22	0.6	0		39.4	0.8	4.5	0.8	0		6.1	10.4	5.2	8.5	0		24	
PHF	**0.75**	**0.81**	**0.9**	**0**		**0.91**	**0.94**	**0.89**	**0.58**	**0**		**0.93**	**0.75**	**0.78**	**0.56**	**0**		**0.81**	**0.81**	**0.69**	**0.85**	**0**		**0.8**	**0.97**
Cars	12	120	206	0		338	188	247	7	0		442	9	50	9	0		68	116	57	94	0		267	1115
% Cars	100	97.6	99	0		98.5	100	100	100	0		100	100	100	100	0		100	99.1	98.3	98.9	0		98.9	99.3
Trucks	0	3	2	0		5	0	0	0	0		0	0	0	0	0		0	1	1	1	0		3	8
% Trucks	0	2.4	1	0		1.5	0	0	0	0		0	0	0	0	0		0	0.9	1.7	1.1	0		1.1	0.7
Bicycles	0	0	0	0		0	0	0	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		0	0	0	0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

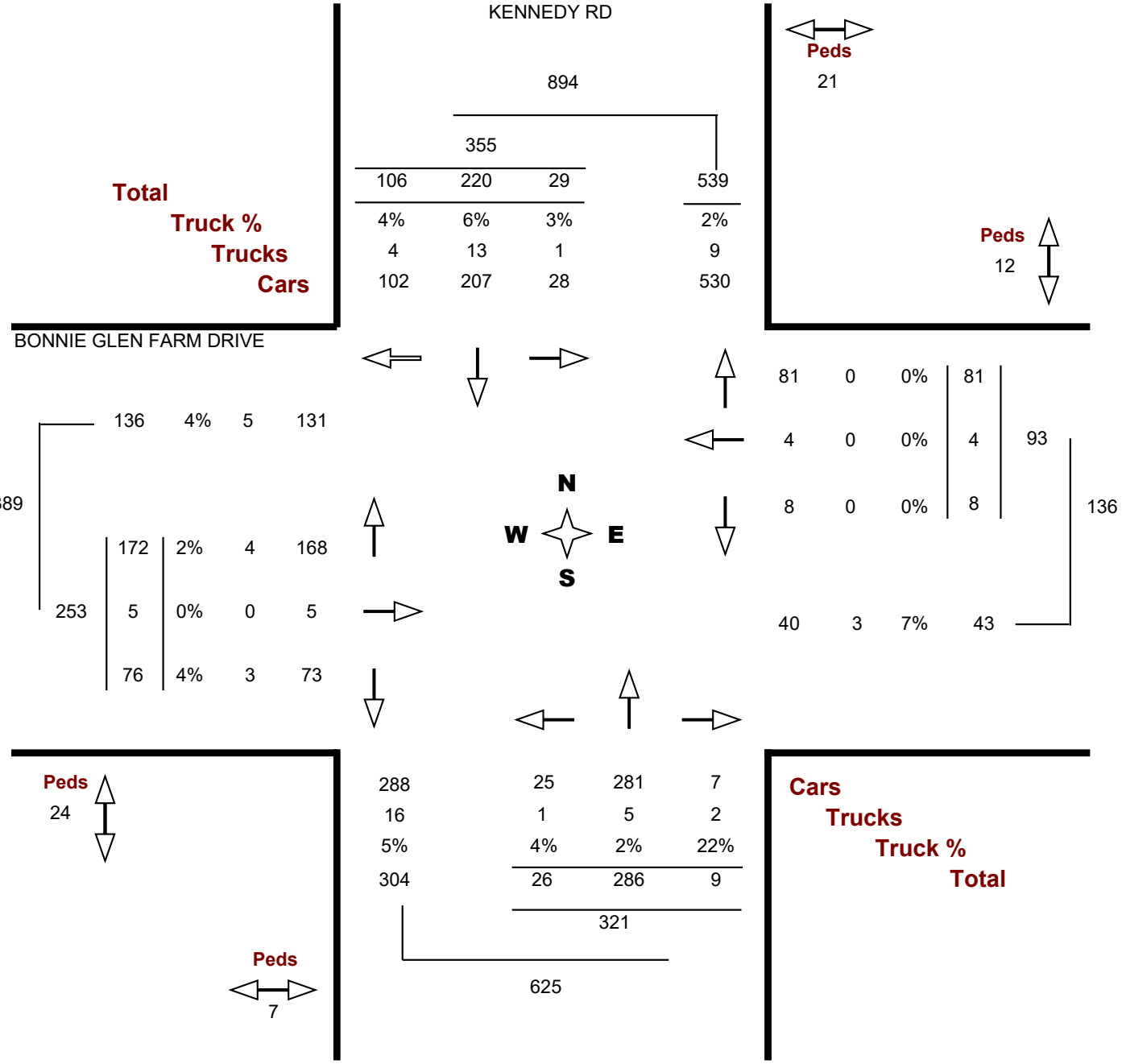
Turning Movements Report - AM Period

Location..... BONNIE GLEN FARM DRIVE @ KENNEDY RD

Municipality..... Caledon

GeoID..... 28898

Count Date..... Thursday, 20 April, 2023 **Peak Hour.....** 07:45 AM — 08:45 AM



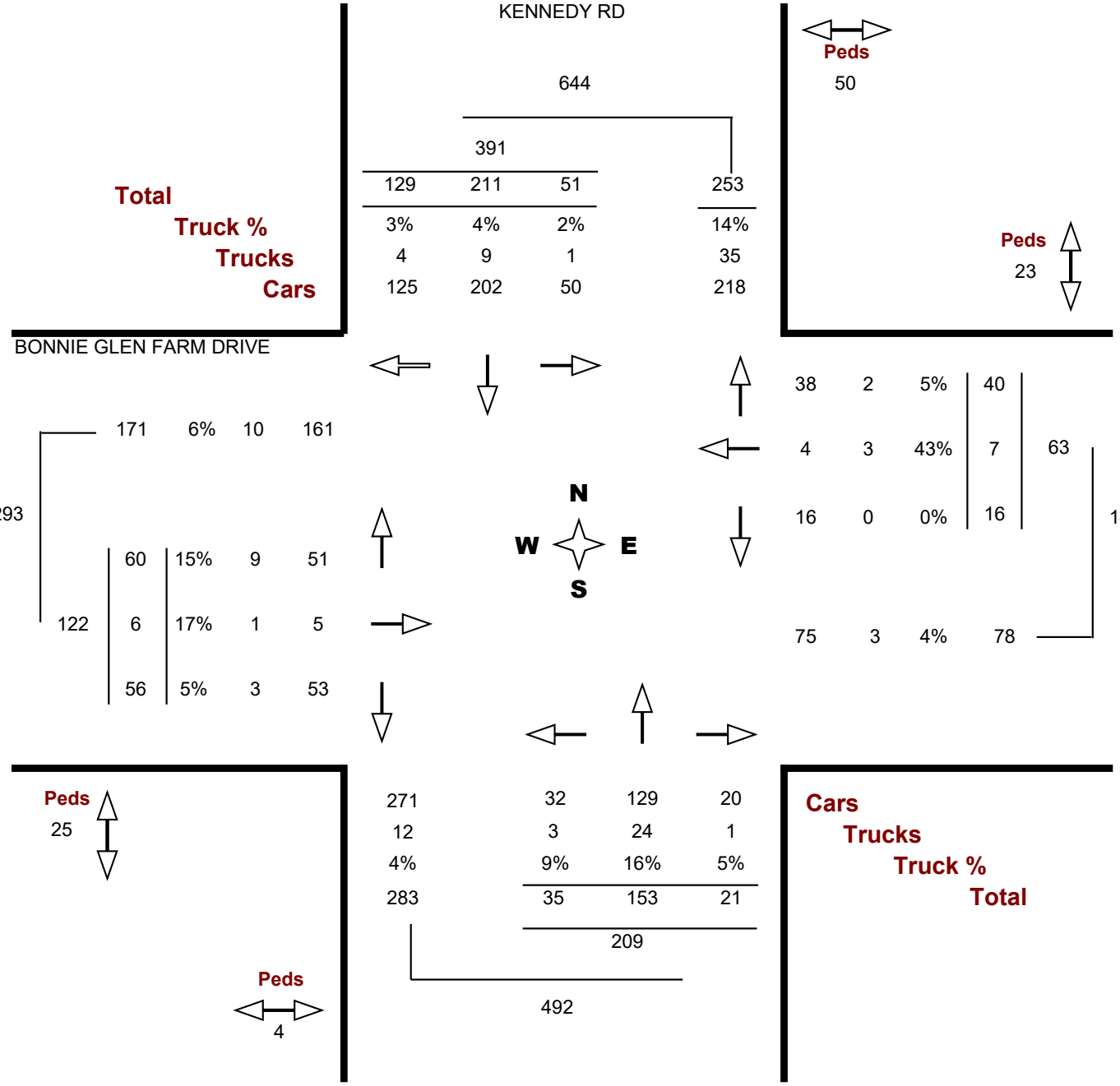
Turning Movements Report - PM Period

Location..... BONNIE GLEN FARM DRIVE @ KENNEDY RD

Municipality..... Caledon

GeoID..... 28898

Count Date..... Thursday, 20 April, 2023 **Peak Hour.....** 03:00 PM — 04:00 PM



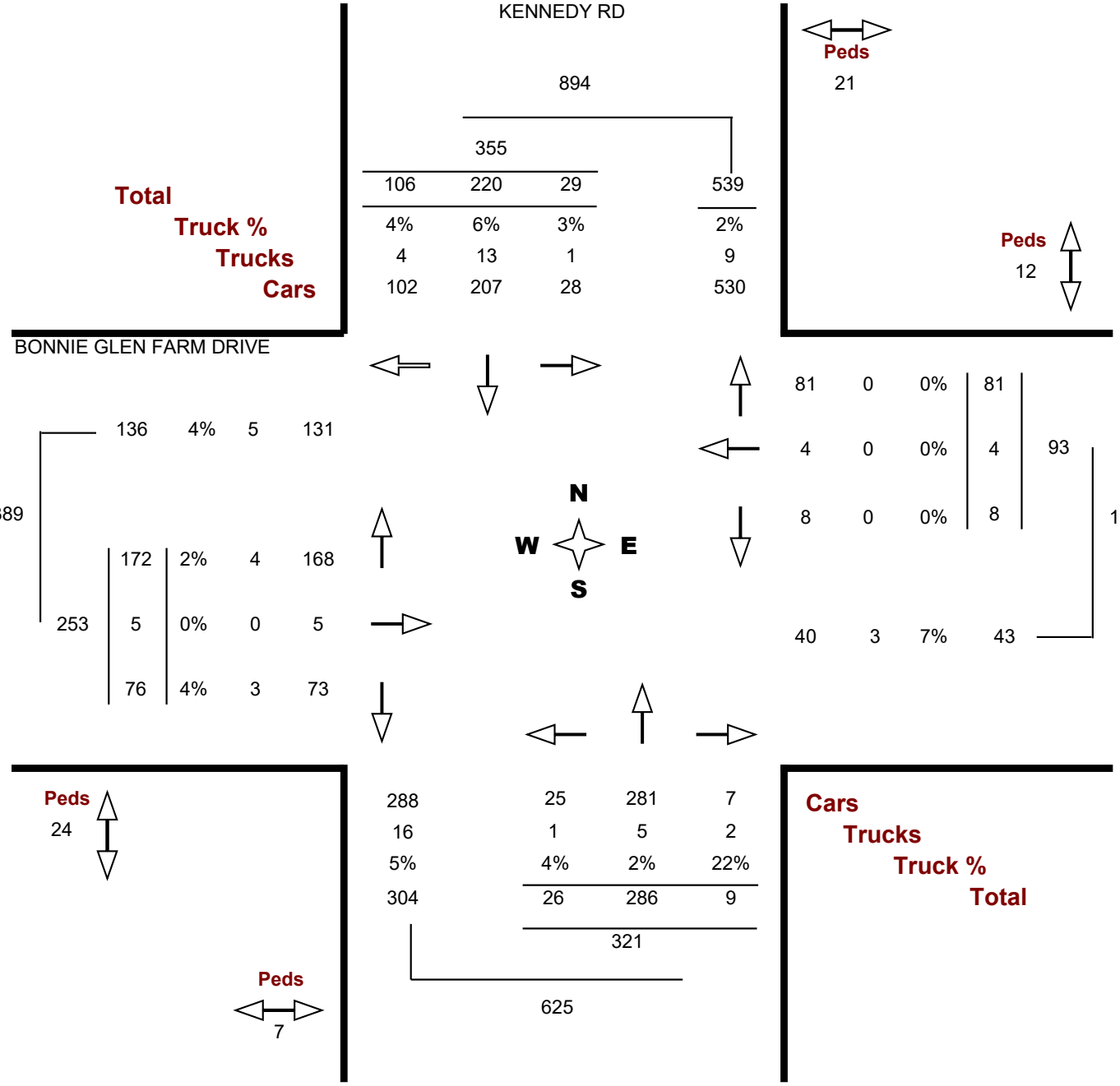
Turning Movements Report - Full Study

Location..... BONNIE GLEN FARM DRIVE @ KENNEDY RD

Municipality..... Caledon

GeoID..... 28898

Count Date..... Thursday, 20 April, 2023 **Peak Hour.....** 07:45 AM — 08:45 AM



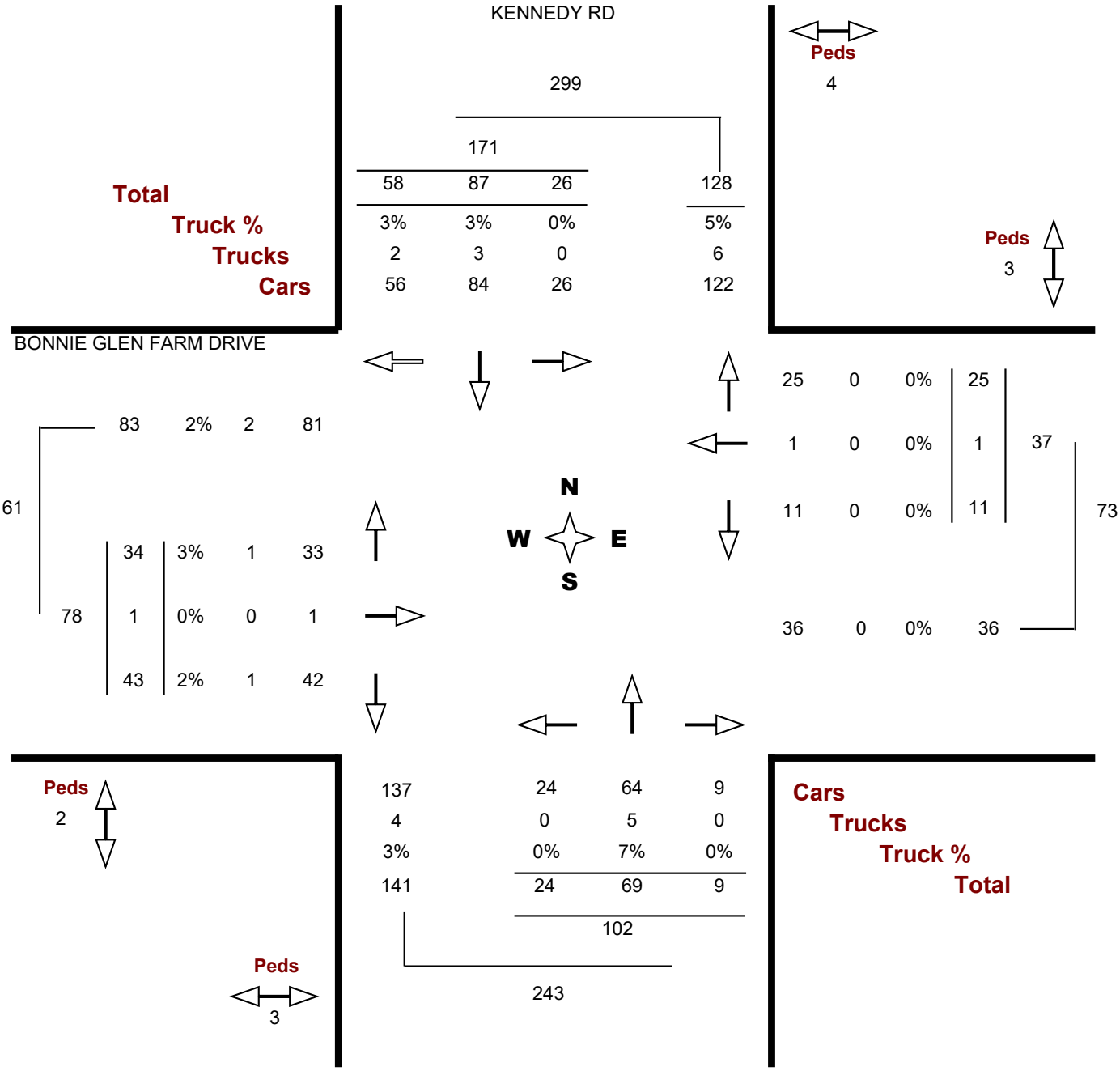
Turning Movements Report - MD Period

Location..... BONNIE GLEN FARM DRIVE @ KENNEDY RD

Municipality..... Caledon

GeoID..... 28898

Count Date..... Thursday, 20 April, 2023 **Peak Hour.....** 12:30 PM — 01:30 PM



APPENDIX C

RELEVANT EXCERPTS FROM BACKGROUND STUDIES

BUTTERMILL DEVELOPMENTS INC.

PROPOSED DEVELOPMENT AT DOUGALL AVENUE AND KENNEDY ROAD, CALEDON

TRAFFIC IMPACT STUDY

TOWN REFERENCE NO.: SP 18-0078

October 18, 2019

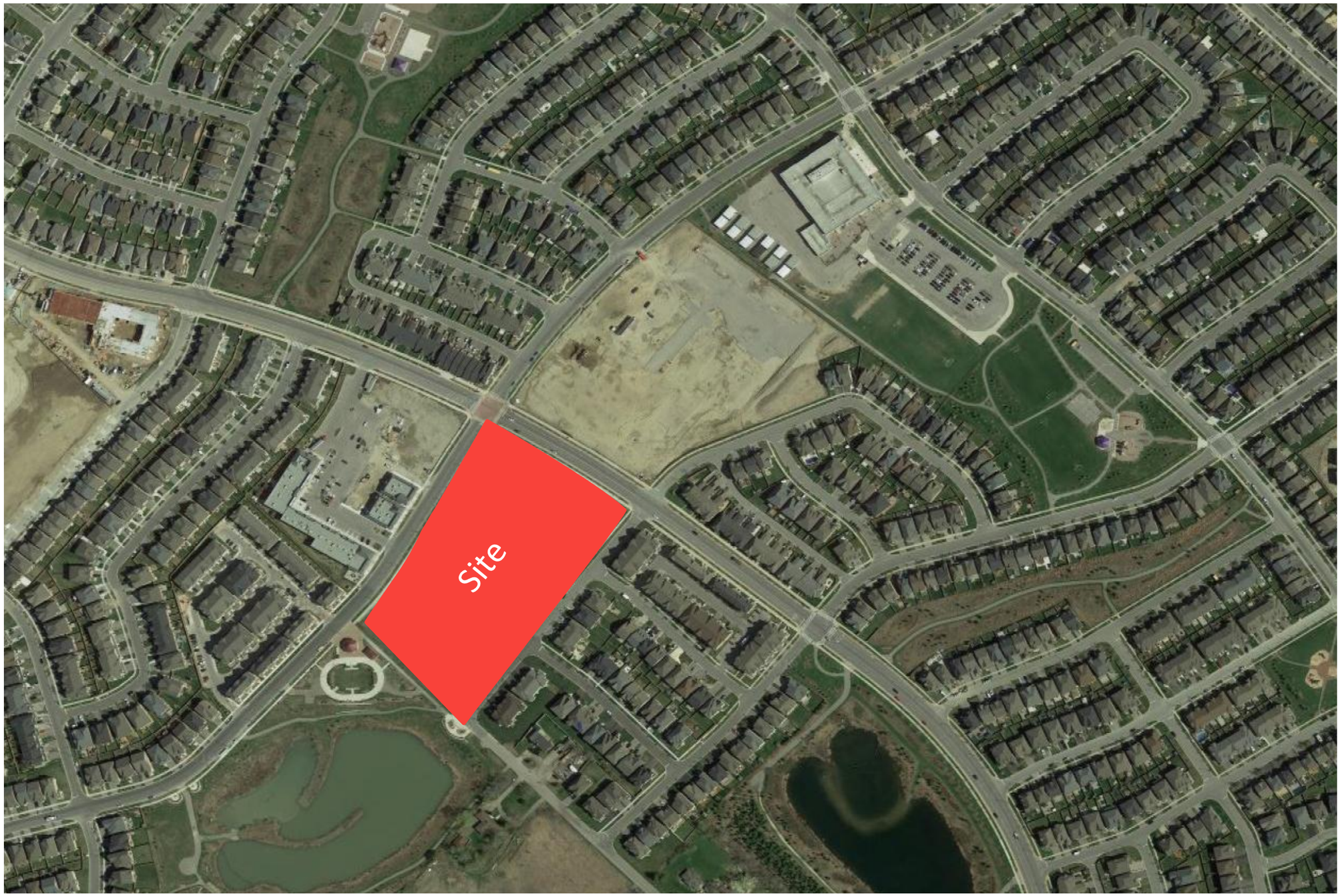


Figure 1.1

Site Location

4 FUTURE TOTAL CONDITIONS

4.1 TRAFFIC GENERATION

As discussed in the introduction, the trip generation for the development was based on the previous site plan that included 172 total residential units, as well as 1,495 sq.m of retail space. Of the 172 units, 121 will be townhouses and 51 will be apartments and dwelling units in a mixed-use building above the 1,495 sq.m retail space at the northeast corner of the site. The only change made in the new site plan was a reduction in the retail space from 1,495 sq.m to 1,389 sq.m and the increase in residential units from 172 to 175. WSP has not updated the traffic analysis as the difference in trip generation would not be significant (one additional trip in the AM peak hour and two additional trips in the PM peak hour) and the analysis results and findings would not change.

Trip generation estimates for the site during the weekday AM and PM peak hours were obtained from the ITE Trip Generation Manual, 10th Edition. The auto trip generation for the apartment and townhouse units was estimated using ITE Land Use Code 221, which is considered to be any residential building that has between 3 to 10 floors. The auto trip generation for the retail portion of the development was estimated using ITE land use code 820. Please note that the equation rate was used for the residential units and an average rate was used for the retail floor space due to the relatively small amount of retail space.

The trip generation calculations are shown in **Table 4-1**. To be conservative, no mode split reductions were applied.

Table 4-1 Estimated Site Vehicle Trip Generation

Land Use	Parameter		Vehicle Trips					
			Weekday AM Peak Hour			Weekday PM Peak Hour		
			Inbound	Outbound	Total	Inbound	Outbound	Total
Mid- Rise Multi-Family Housing (172 Units)	ITE Land Use 221	Directional Distribution	26%	74%	100%	61%	39%	100%
		Trip Rate	LN(T)=0.98*LN(x)-0.98 = 0.34			LN(T)=0.96*LN(x)-0.63 = 0.43		
		Generated Trips	15	43	58	45	29	74
Retail (1,495 sq.m)	ITE Land Use 820	Directional Distribution	62%	38%	100%	48%	52%	100%
		Average Trip Rate	0.94			3.81		
		Generated Trips	1	1	2	3	3	6
		Total Vehicle Trips	**16**	**44**	**60**	**48**	**32**	**80**

The proposed development is expected to generate 60 vehicle trips (16 inbound and 44 outbound) during the weekday AM peak hour and 80 vehicle trips (48 inbound and 32 outbound) during the weekday PM peak hour.

4.2 TRIP DISTRIBUTION AND ASSIGNMENT

Site traffic distribution for the proposed development is based on the 2016 TTS. To determine the distribution of the generated traffic, a query of ten traffic zones was used from the surrounding site area. The zones included six from Caledon (3007, 3008, 3009, 3010, 3011, and 3146) and four from Brampton (3381, 3459, 3460, and 3465). The combination of the existing travel patterns across these zones, according to the 2016 TTS, determined the final gateway distributions used for this study as shown in **Table 4-2.**

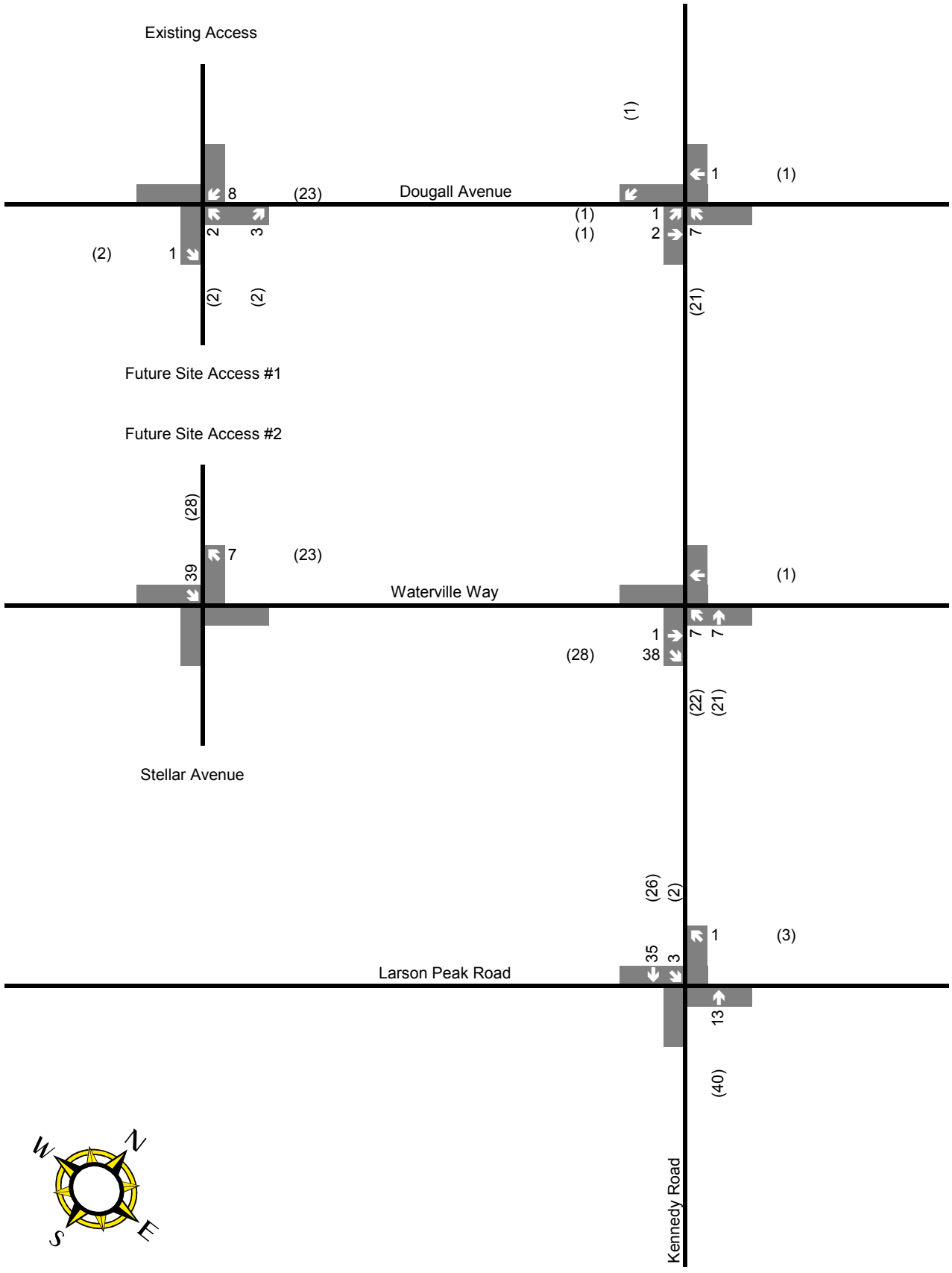
Table 4-2 Gateway Distribution

Gateway Number	Location	AM (IN)	AM (OUT)	PM (IN)	PM (OUT)
1	South via Kennedy	79%	79%	81%	80%
2	North via Kennedy	2%	2%	2%	3%
3	East via Dougall	4%	4%	3%	2%
4	West via Dougall	5%	5%	5%	5%
5	East via Larson Peak Road	7%	7%	6%	6%
6	West via Larson Peak Road	1%	1%	1%	1%
7	East via Waterville	2%	2%	2%	2%
8	West via Waterville	1%	1%	1%	1%
9	South via Stellar	0%	0%	0%	0%
	TOTAL	100%	100%	100%	100%

Traffic generated by the proposed residential development was assigned to the boundary roads in accordance with the trip distribution shown in **Table 4-2.** The majority of site generated traffic is coming and going from the South along Kennedy Road. Since the intersection of Dougall Avenue and Kennedy Road is already experiencing significant delays from the background growth, it is assumed that outbound traffic will make use of the southern site access in the AM peak hour. In the PM peak hour, it is assumed that 50% of traffic will make use of the southern access to the site and 50% will make use of the northern access. Site traffic volumes are shown in **Figure 4.1.**

4.3 FUTURE TOTAL TRAFFIC VOLUMES

Future total conditions include the addition of 2024 future background traffic volumes to the estimated site traffic volumes in the study area during the weekday AM and PM peak hours. The resulting volumes are presented in **Figure 4.2.**



Legend

xx A.M. Peak Hour Traffic Volumes

(xx) P.M. Peak Hour Traffic Volumes

Figure 4.1

Site Traffic

Turning Movement Counts

TRAFFIC IMPACT STUDY

FOR

PROPOSED MIXED-USE RE-DEVELOPMENT

12530 AND 12540 KENNEDY ROAD NORTH AND 0 DOUGALL AVENUE

TOWN OF CALEDON

TOWN FILE NO. SPA 2022-0006 & SPA 2022-0072

PREPARED FOR

ENGLISH PRESTIGE CONSTRUCTION MANAGEMENT

UPDATED AUGUST 18TH 2023

CANDEVCON LIMITED
CONSULTING ENGINEERS & PLANNERS
TEL (905) 794-0600 FAX (905) 794-0611

PROJECT NO. W21137

2. SUBJECT DEVELOPMENT – STUDY AREA

The Subject Development is located immediately west of Kennedy Road North and north of Dougall Avenue. The total area of the Subject Development is 4.39 acres.

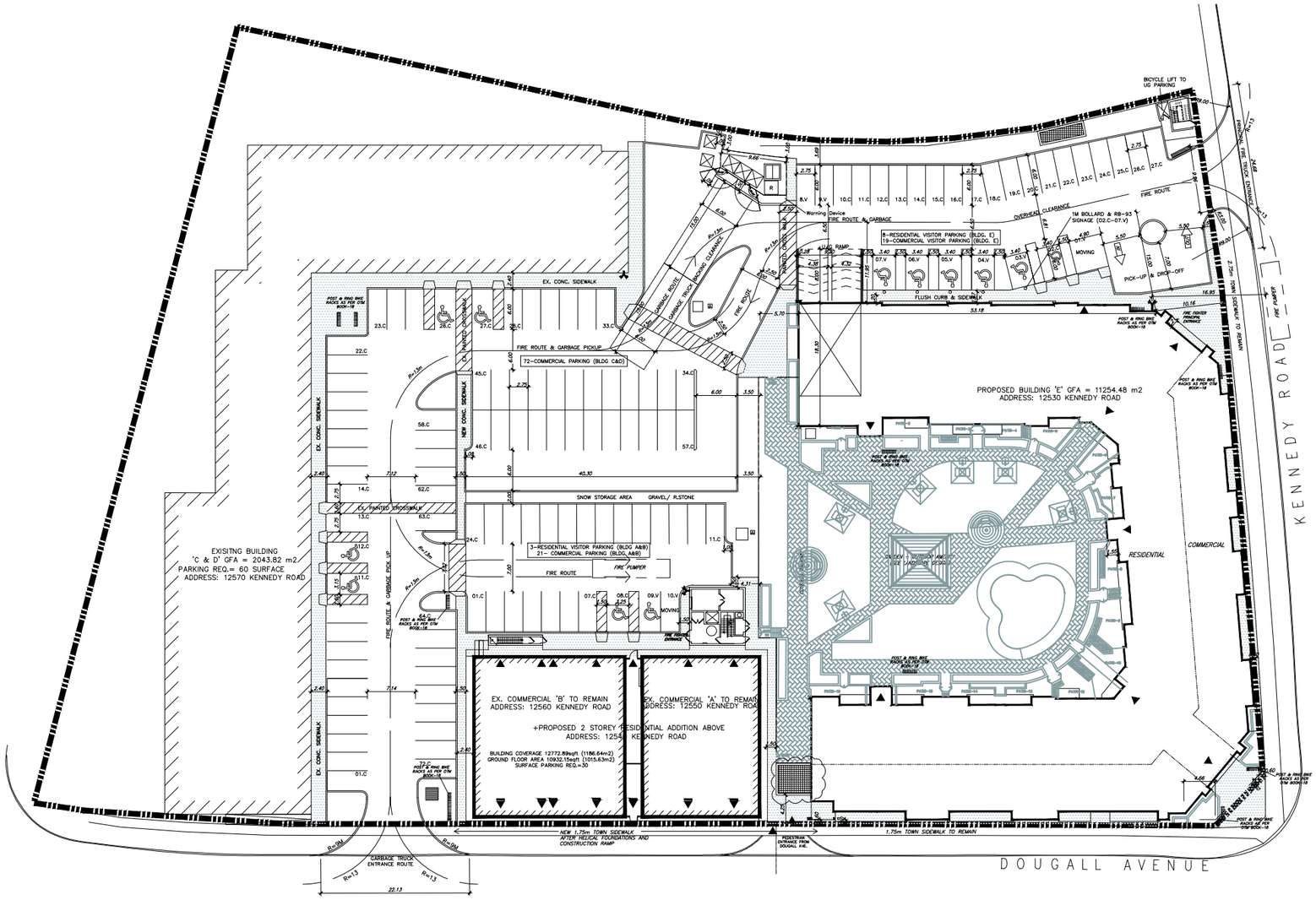
The Subject Development is surrounded by the following land uses:

- To the north, existing residential,
- To the east, Kennedy Road North with existing residential beyond,
- To the south, Dougall Avenue with a proposed Mixed-Use Subdivision (Town File No. 21CDM-21002C and 21CDM-21003C) beyond,
- To the west, existing residential.

Currently, the Subject Development comprises three (3) buildings with a total of 19 commercial units, an existing full-moves access at Kennedy Road North and two (2) existing full-moves accesses at Dougall Avenue. The total gross leasable area (G.L.A.) of the commercial units is 32,931 ft^2 (3,059 m^2).

As a part of the proposed Mixed-Use Redevelopment, the two (2) existing buildings that are between the accesses at Dougall Avenue will be connected and 24 apartment units in total will be added by constructing a second and third floor. Also, a new four (4) storey mixed-use building with 134 apartment units and eleven (11) commercial units will be constructed. The proposed building will be located at the southeast corner of the property. The commercial units within the proposed building will have a total G.L.A. of 9,322 ft^2 (866 m^2). The development will have 312 parking spaces in total with 123 parking spaces on the surface and 189 parking spaces in an underground garage and 161 bicycle parking spaces in total with 121 parking spaces on the surface and 40 parking spaces in the underground garage. In addition, the Existing Site Access "2" (East) at Dougall Avenue will be repurposed to an access for pedestrians.

For the proposed Mixed-Use Redevelopment, the Site Plan is provided in **Figure 2** and the Underground Parking Plan is provided in **Figure 3**.



TRAFFIC IMPACT STUDY
ENGLISH PRESTIGE CONSTRUCTION MANAGEMENT
PROPOSED MIXED-USE REDEVELOPMENT
DOUGALL AVENUE AND KENNEDY ROAD
TOWN OF CALEDON

PROPOSED SITE PLAN

CANDEVCON LIMITED
CONSULTING ENGINEERS AND PLANNERS
TEL. (905) 794-0800 FAX (905) 794-0611

DATE: AUGUST, 18th 2023	JOB No. W21137
DESIGN: R.V.M.	FIG. No. 2
SCALE: 1:750	

6. TRIP GENERATION AND DISTRIBUTION

6.1 The Reassignment of Site-Generated Trips from Existing Land Uses

With the proposed modification to the existing east site access at Dougall Avenue, inbound and outbound traffic volumes will have to be re-assigned to enter or leave the Subject Property via the existing west site access at Dougall Avenue.

The trip reassignment of those vehicles during the A.M. and P.M. Peak Hours are illustrated in **Figures 16 and 17**.

6.2. Trip Generation

For the proposed apartment units (Land Use 231) and the proposed retail land use (Land Use 820), the trip generation rates and formulae from the ITE Trip Generation Manual 10th Edition were applied for the A.M. and P.M. Peak Hours. For the retail land use, the worst-case between the trip generation rate and the trip generation formula was applied for each scenario.

Table 10 summarizes the trip generation rates and formulae along with the percentages of incoming and outgoing trips for the A.M. and P.M. Peak Hours.

Table 10: Trip Generation Rates and Formulae with Inbound and Outbound Percentages

ITE Land Use	A.M. Peak Hour			P.M. Peak Hour		
	Trip Rate/ Fitted Curve Equation	% In	% Out	Trip Rate/ Fitted Curve Equation	% In	% Out
Mid-Rise Residential with 1st-Floor Commercial (LU 231)	0.30 (Note 1)	28%	72%	0.36 (Note 1)	70%	30%
Shopping Centre (LU 820)	T= 0.50X + 151.78 (Note 2)	62%	38%	Ln(T) = 0.74Ln(X) + 2.89 (Note 2)	48%	52%

Note 1: The trip rate is per dwelling unit.
Note 2: T represents the total number of trips and X represents every 1,000 square feet of G.L.A.

6. TRIP GENERATION AND DISTRIBUTION (CONT'D)

6.3 Total Site-Generated Trips

For the proposed apartment units, the resulting number of trips generated was determined by using the trip generation rates provided in **Table 10** and the number of units. 158 apartment units are proposed as a part of the Mixed-Use Redevelopment.

For the proposed commercial land uses, the resulting number of trips generated was determined by the trip generation formulae provided in **Table 10** and the G.L.A. Eleven (11) commercial units with a total G.L.A. of 9,322 ft^2 are proposed. This Study applied a pass-by percentage of 34% for the P.M. Peak Hour. The pass-by trip percentage was based on the data provided in the ITE Trip Generation Handbook 3rd Edition.[9]

The resulting number of trips generated is provided in **Table 11** for the A.M. and P.M. Peak Hours of adjacent street traffic.

Table 11: Site-Generated Trips

Land Use	Quantity	Trips	A.M. Peak Hour (Adj. Street)			P.M. Peak Hour (Adj. Street)		
			Trips In	Trips Out	Total	Trips In	Trips Out	Total
Mid-Rise Residential with 1st-Floor Commercial	158 Dwelling units	Gross Trips	13	34	47	40	17	57
Shopping Centre	9,322 ft^2	Gross Trips	97	59	156	45	49	94
		Pass-by Trips	0	0	0	15	15	30
Total	-	Gross Trips	110	93	**203**	85	66	**151**
		Pass-by Trips	0	0	0	15	15	30

The proposed Mixed-Use Redevelopment is expected to generate a total of 203 net trips during the A.M. Peak Hour (110 inbound trips and 93 outbound trips) and 151 trips during the P.M. Peak Hour (85 inbound trips and 66 outbound trips).

[9] Trip Generation Handbook (3rd Edition), Institute of Transportation Engineers, September 2017.

6. TRIP GENERATION AND DISTRIBUTION (CONT'D)

6.4 Trip Distribution and Assignment

For the residential land use, based on the nature of the land use, the majority of the trips generated will not be local traffic. Therefore, the A.M. Peak Period work trip distribution from the 2016 Transportation Tomorrow Survey and the future road network were utilized for the assumed trip distribution and trip assignment.

The assumed trip distribution and assignment will be as follows:

- 12% (12%) to/from the north via Kennedy Road,
- 88% (88%) to/from the south via Kennedy Road.

For the commercial land use, based on the nature of the land use, the trip distribution and assignment is based on the future residential land use within the vicinity of proposed Mixed-Use Redevelopment.

The assumed trip distribution and assignment will be as follows:

- 35% (35%) to/from the north via Kennedy Road,
- 15% (15%) to/from the east via Dougall Avenue,
- 20% (20%) to/from the south via Kennedy Road,
- 30% (30%) to/from the west via Dougall Avenue.

The site-generated trip volumes and trip assignment used in the analysis for the proposed Mixed-Use Redevelopment are illustrated in **Figures 18 and 19**.

The Trip Assignment of the Proposed Mixed-Use Redevelopment
A.M. Peak Hour

W21137
Proposed Mixed-Use Redevelopment
Town of Caledon
English Prestige Construction Management

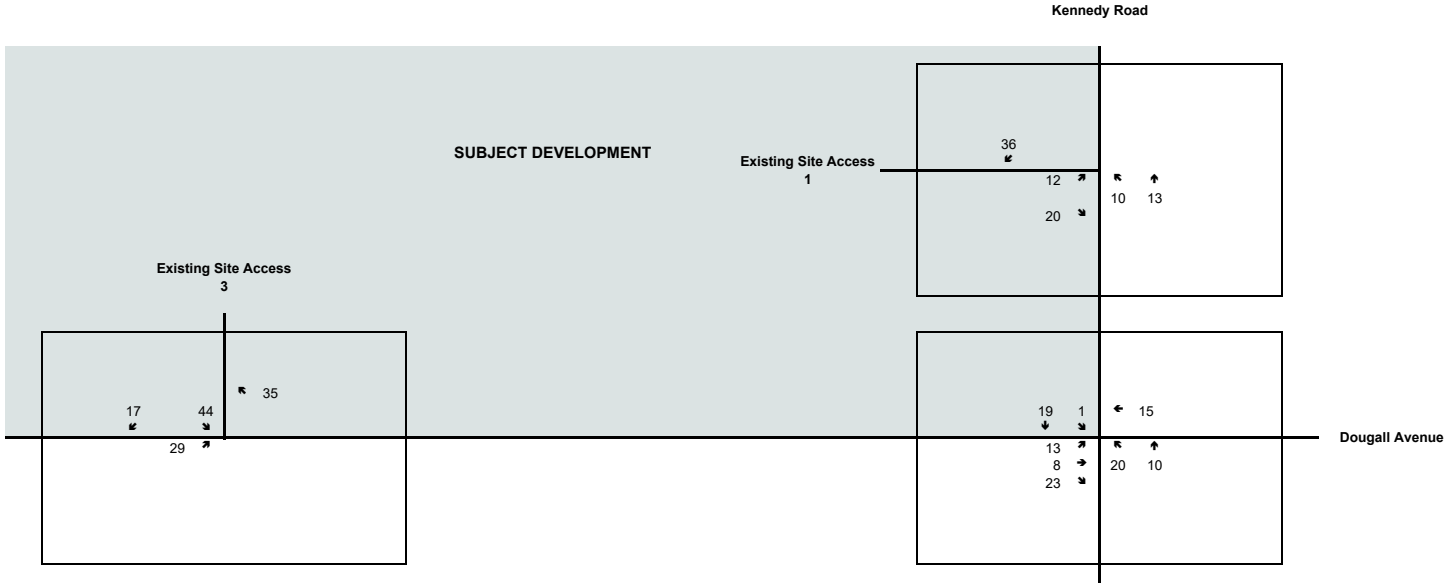


Figure No: 18

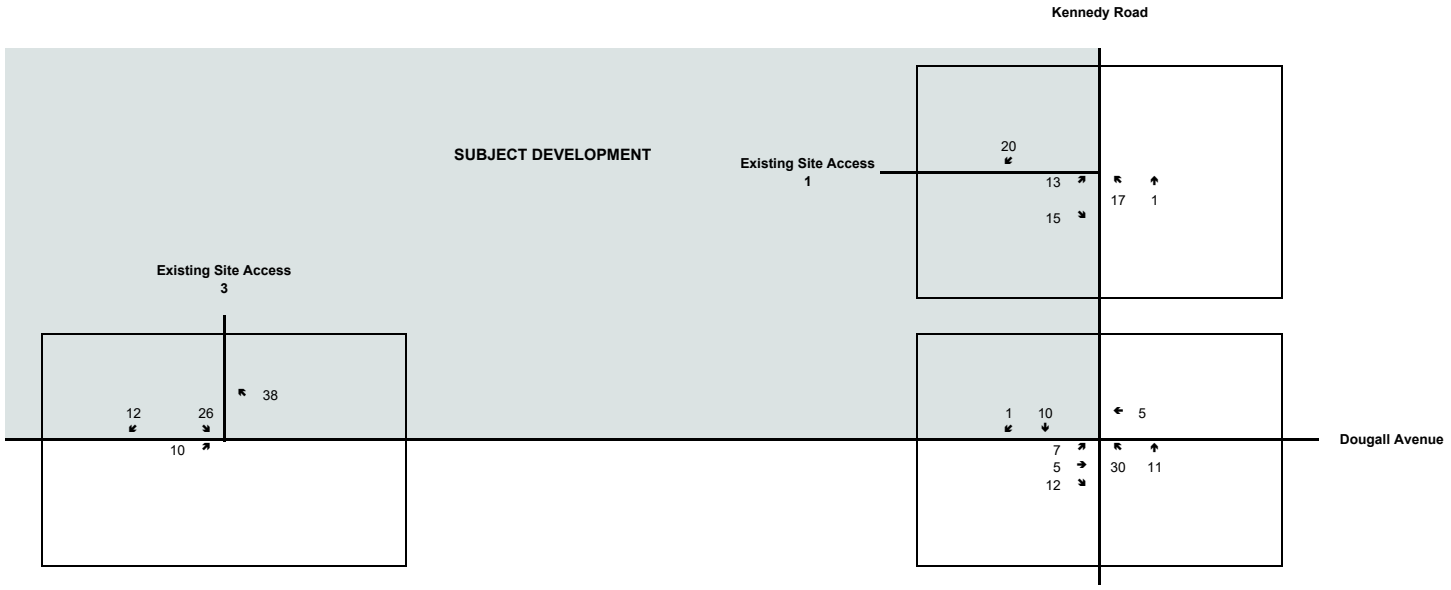
Date: September 13 2022

Prepared by: B.W.

N

The Trip Assignment of the Proposed Mixed-Use Redevelopment
P.M. Peak Hour

W21137
Proposed Mixed-Use Redevelopment
Town of Caledon
English Prestige Construction Management



Note : Traffic Volumes do not balance due to Passby Trips.

Figure No: 19

Date: September 13 2022

Prepared by: B.W.

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Southfields Community Centre
Town of Caledon

Traffic Impact Study for
Town of Caledon

Type of Document:
Final Report

Project Number:
JDE – 1792

Date Submitted:
September 28th, 2017

John Northcote, P.Eng.
Professional License #: 100124071

ENGINEERING

JD Northcote Engineering Inc.
86 Cumberland Street
Barrie, ON
705.725.4035
www.JDEngineering.ca

2.3 Transit Access

There is no municipal transit service currently available within the study area.

2.4 Other Developments within the Study Area

Based on discussions with the Town, there are a number of other developments in the area that will impact the traffic generation rates, specifically:

- Kennedy Trails Development Ltd.;
- Digram Developments Caledon Inc. / Yeoman Developments Inc. / Moscorp VII Developments Inc. Stage 2;
- Southfields Community Inc. Stage 3;
- Mayfield West Catholic Elementary School; and
- Regional Municipality of Peel Senior Rental Apartment.

In addition to the above noted developments, there are other developments in the area that will generate trips which are assumed to be accounted for by the background growth rate discussed in Section 2.5, as per our discussions with the Town. Some of these developments include the Dougall Avenue Commercial Plaza, municipally known as 12570 Kennedy Road, located northwest of the Kennedy Road / Dougall Avenue intersection and the residential Coscorp development located west of the above noted Dougall Avenue Commercial Plaza.

2.4.1 Traffic Generation Methodology for Adjacent Developments

With the exception of the Mayfield West Catholic Elementary School, the traffic impact studies for the above-noted developments were not available; consequently, the traffic generation has been calculated based on the data provided in the Institute of Transportation Engineers [ITE] *Trip Generation Manual* (9th Edition) [ITE Trip Generation Manual]. The following ITE land uses have been applied to estimate the traffic from the adjacent developments:

- ITE land use 210 (Single-Family Detached Housing)
- ITE land use 230 (Residential Condominium/Townhouse)
- ITE land use 252 (Senior Adult Housing - Attached)

The AM and PM peak traffic generation for the adjacent developments do not exactly align with the AM and PM peak hour in the traffic counts; consequently, we have applied the peak hour of adjacent street traffic values provided in the ITE Trip Generation Manual.

2.4.2 Traffic Assignment Methodology for Adjacent Developments

The ITE data provides the anticipated percentage of new traffic entering and exiting during the peak hour.

The distribution of traffic for single-family detached housing and residential townhouses has been calculated based on the 2011 Transportation Tomorrow Survey [TTS] data for traffic zones 3007, 3008, 3009, 3010 and 3146 retrieved using the TTS Internet Data Retrieval System [IDRS] (output attached as **Appendix H**). TTS data provides historical origin and destination work trip percentages for specific areas within the Town and the Greater Toronto and Hamilton Area [GTHA].

Traffic distribution for the trips generated by the single-family detached housing and residential townhouses during the AM and PM peak hour are expected to generally follow commuter travel patterns. Our analysis is based on egress traffic during the AM peak hour. Logically, the distribution

MAYFIELD WEST PHASE 1 - STAGE 2
LOCAL OFFICIAL PLAN AMENDMENT

UPDATED Transportation Considerations Report
Town of Caledon

Prepared For: The Mayfield West Phase 1-2 Landowners Group

August 2023

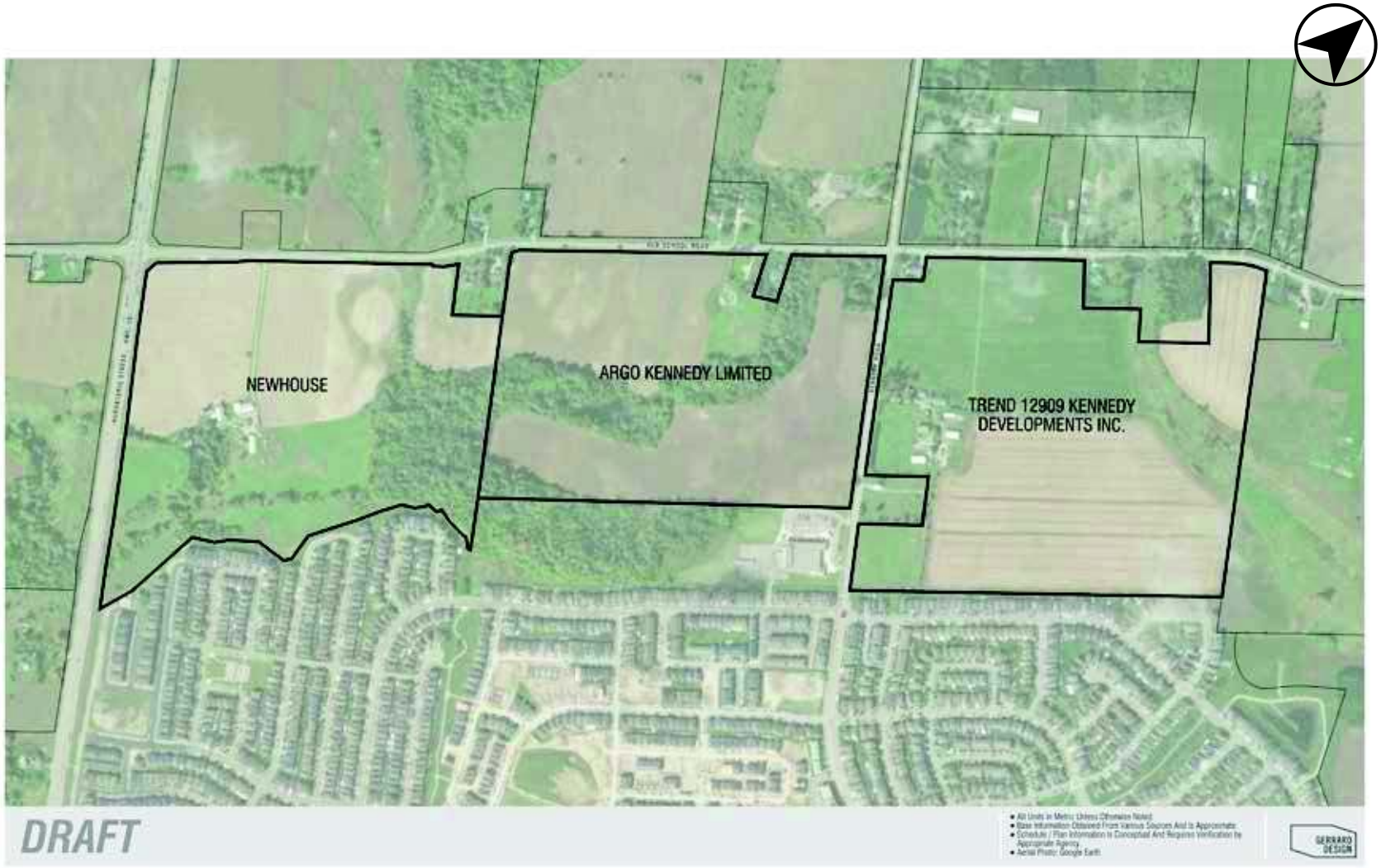

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FIGURE 4 LAND OWNERSHIP CONTEXT

NEWHOUSE/KENNEDY/RUSSELL | Caledon, Ontario

PRELIMINARY CONCEPT PLAN (Russell - based on July 21, 2023 Development Plan by CDC Consultants)

AUG 11, 2023
PROJECT 2087
SCALE 1:6000

SK-31

LEGEND

Site Boundary

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FIGURE 5 DEVELOPMENT CONCEPT PLAN

TABLE 7 SITE RESIDENTIAL VEHICLE TRIP GENERATION

Land Use	Dwelling Count	AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
Traffic Zone 1							
Single Detached Dwelling	129	0.18	0.52	0.70	0.59	0.35	0.94
		25	65	90	75	45	120
Townhouse	231	0.10	0.30	0.40	0.32	0.19	0.51
		20	70	90	75	45	120
Mid-Rise Residential	171	0.09	0.28	0.37	0.24	0.15	0.39
		15	50	65	40	25	65
Total		**60**	**185**	**245**	**190**	**115**	**305**
Traffic Zone 2							
Townhouse	78	0.10	0.30	0.40	0.32	0.19	0.51
		5	25	30	25	15	40
Single Detached Dwelling	166	0.18	0.52	0.70	0.59	0.35	0.94
		30	85	115	100	55	155
Total		**35**	**110**	**145**	**125**	**70**	**195**
Traffic Zone 3							
Single Detached Dwelling	196	0.18	0.52	0.70	0.59	0.35	0.94
		15	50	65	60	35	95
Townhouse	100	0.10	0.30	0.40	0.32	0.19	0.51
		20	60	80	60	35	95
Total		**35**	**110**	**145**	**120**	**70**	**190**
Traffic Zone 4							
Single Detached Dwelling	269	0.18	0.52	0.70	0.59	0.35	0.94
		45	140	185	160	95	255
Townhouse	106	0.10	0.30	0.40	0.32	0.19	0.51
		10	35	45	35	20	55
Mid-Rise Residential	459	0.09	0.28	0.37	0.24	0.15	0.39
		40	130	170	110	70	180
Total		**95**	**305**	**400**	**305**	**185**	**490**
Total Site Vehicle Trips							
Total		**225**	**710**	**935**	**740**	**440**	**1180**

Notes:
1. Trips were rounded to the nearest 5.

6.3.3 Trip Distribution and Assignment

The residential trip distribution for the site is developed based on a review of 2016 Transportation Tomorrow Survey (TTS). Site traffic is assigned to the area network according to the distribution provided in **Table 9**, site driveway locations, and local road characteristics (i.e. turning movement restrictions).

In the +5 year post-buildout scenario (2033), site traffic is shown distributed depending on whether the Highway 413 is constructed. The assignment of site traffic to the network with and without Highway 413 is illustrated in **Figure 20** and **Figure 21**, respectively.

Detailed TTS queries for travel characteristics are attached in Appendix G.

TABLE 9 TRIP DISTRIBUTION PATTERN

Direction	Inbound	Outbound
Without Highway 413		
North	2%	3%
South	71%	68%
East	19%	22%
West	8%	7%
Total	**100%**	**100%**
With Highway 413		
North	21%	20%
South	57%	55%
East	17%	21%
West	5%	4%
Total	**100%**	**100%**

Notes:
1. Based on 2016 TTS data for home-based trips to / from 2006 TTS Zones 169 and 173 during the weekday morning and afternoon peak periods.

The distribution of site traffic notably shifts to/from the north in future with Highway 413 vs. south under existing road patterns by approximately 15% with the introduction of the Highway 413 interchange.

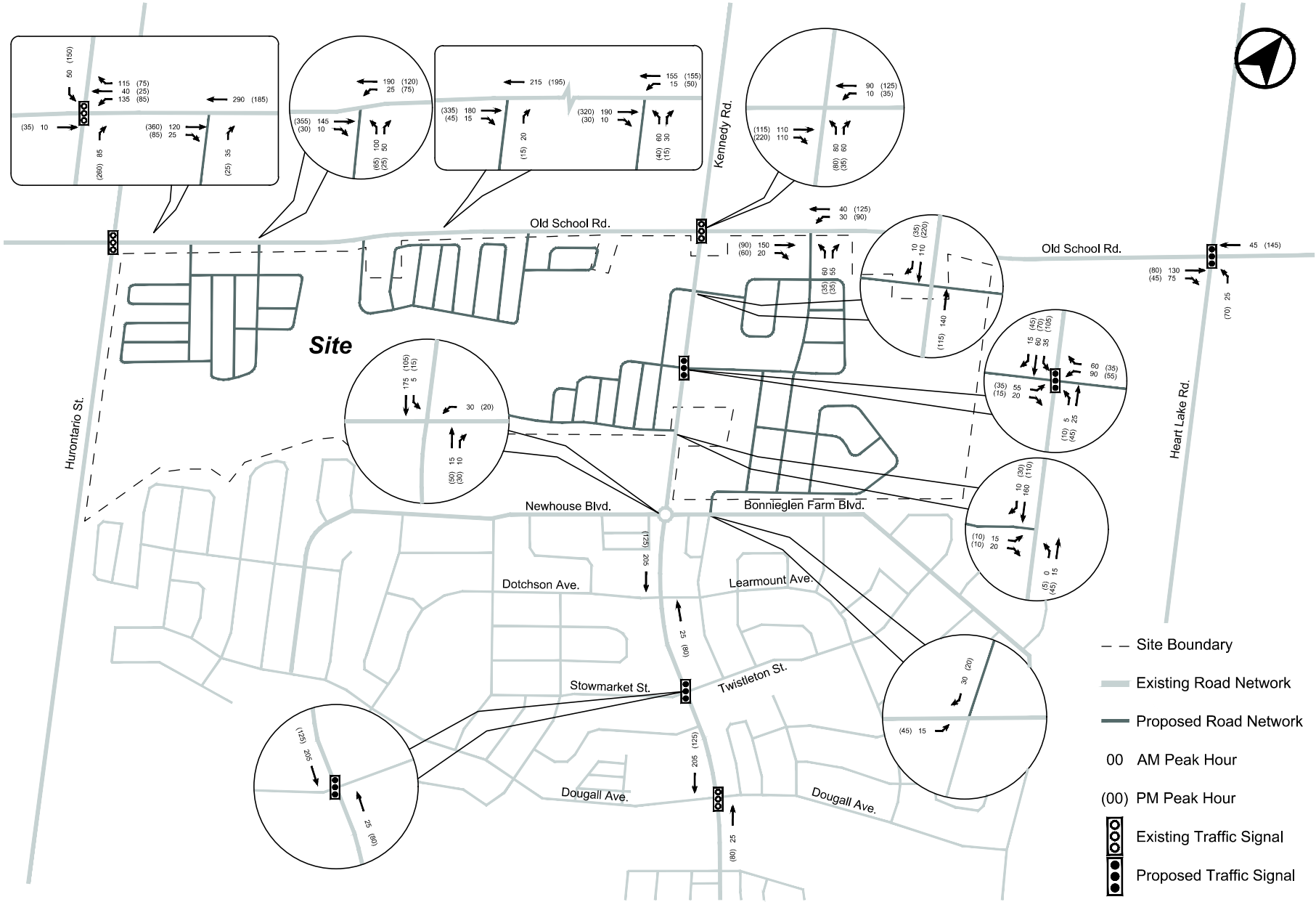

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FIGURE 20 SITE TRAFFIC VOLUMES WITH HIGHWAY 413

APPENDIX D

SIGNAL TIMING PLANS
RECEIVED FROM THE REGION OF PEEL

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

Database Date	**April 5, 2024**		**Prepared Date**	**April 8, 2024**
Database Rev	**iNET**		**Completed By**	**N.R.L**
Timing Card / Field rev	**31**		**Checked By**	**J.V**

Location	**Kennedy Road and Old School Road**

Phase #	**Street Name - Direction**	**Vehicle Minimum (s)**	**Pedestrian Minimum (s)**		**Amber (s)**	**All Red (s)**	**TIME PERIOD (s) (Green+Amber+All Red)**		
			WALK	**FDWALK**			**AM SPLITS**	**OFF SPLITS**	**PM SPLITS**
1	Not In Use	-	-	-	-	-	-	-	-
2	Kennedy Road - Southbound	8	8	7	4.0	2.2	30	30	45
3	Not In Use	-	-	-	-	-	-	-	-
4	Old School Road - Eastbound	8	8	7	4.0	2.3	40	30	35
5	Not In Use	-	-	-	-	-	-	-	-
6	Kennedy Road - Northbound	8	8	7	4.0	2.2	30	30	45
7	Not In Use	-	-	-	-	-	-	-	-
8	Old School Road - Westbound	8	8	7	4.0	2.3	40	30	35

System Control
Yes

Semi-Actuated Mode
Yes

TIME (M-F)	**PEAK**	**CYCLE LENGTH (s)**	**OFFSET (s)**
06:00 - 09:00	AM	70	0
09:00 - 15:00	OFF	60	0
15:00 - 20:00	PM	80	0

APPENDIX E

LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE DEFINITIONS

Level of Service Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (seconds)	Interpretation
A	≤ 10	**Excellent.** Progression is extremely favourable and most of the vehicles arrive during the green phase. Most vehicles do not stop at all
B	>10 & ≤ 20	**Very Good.** Good progressing, short cycle lengths or both. More vehicles stop than with LOS "A", causing higher levels of average delay.
C	>20 & ≤ 35	**Good.** Fair progressing, longer cycle lengths or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
D	>35 & ≤ 55	**Fair.** At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavourable progression, long cycle lengths, or high V/C ratio. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	>55 & ≤ 80	**Poor.** This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.
F	>80	**Unsatisfactory.** This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occurs at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such delays. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.

Source: *From Highway Capacity Manual Special Report 209-Table 9-1, Page 9-7*

LEVEL OF SERVICE DEFINITIONS

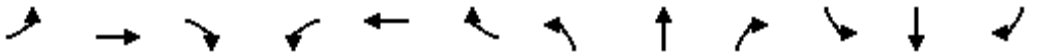
Level of Service Criteria for Two Way Stop Control (TWSC) Intersections

Level of Service	Control Delay per Vehicle (seconds)	Interpretation
A	≤ 10	**Excellent.** Large & frequent gaps in traffic on the main roadway. Queuing on the minor street is rare
B	>10 & ≤ 15	**Very Good**. Fewer gaps exist in the traffic on the main roadway. Queuing on the minor street is minimal.
C	>15 & ≤ 25	**Good.** Fewer gaps exist in traffic on the main roadway. Delay on the minor approach becomes more noticeable.
D	>25 & ≤ 35	**Fair.** Infrequent & shorter gaps in traffic on the main roadway. Queuing lengths develop on the minor street.
E	>35 & ≤ 50	**Poor.** Very infrequent gaps in traffic on the main roadway. Queuing lengths become noticeable.
F	>50	**Unsatisfactory.** Very few gaps in traffic on the main roadway. Excessive delays with significant queue lengths on the minor street

Source: *From Highway Capacity Manual Special Report 209-Table 10-7, Page No.10-25*

APPENDIX F

SIGNALIZED AND UN-SIGNALIZED INTERSECTION CAPACITY ANALYSIS FOR EXISTING (2024), FUTURE (2033 & 2038) TOTAL BACKGROUND AND FUTURE (2033 & 2038) TOTAL TRAFFIC SCENARIOS

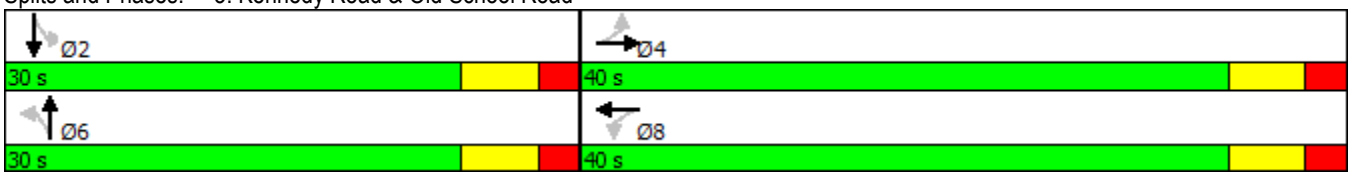


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	40	234	16	62	9	82	101	5	8	187	130
Future Volume (vph)	138	40	234	16	62	9	82	101	5	8	187	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Satd. Flow (prot)	0	1678	0	0	1714	0	0	1780	0	0	1755	0
Flt Permitted		0.854			0.905			0.747			0.993	
Satd. Flow (perm)	0	1456	0	0	1565	0	0	1358	0	0	1744	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		130			9			2			52	
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		88.3			225.4			128.5			131.7	
Travel Time (s)		4.5			11.6			7.7			7.9	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	3%	3%	13%	10%	0%	2%	7%	20%	13%	2%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	412	0	0	87	0	0	188	0	0	325	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Detector Phase	4	4		8	8		6	6		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	21.3	21.3		21.3	21.3		21.2	21.2		21.2	21.2	
Total Split (s)	40.0	40.0		40.0	40.0		30.0	30.0		30.0	30.0	
Total Split (%)	57.1%	57.1%		57.1%	57.1%		42.9%	42.9%		42.9%	42.9%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.3			6.3			6.2			6.2	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		16.1			16.1			24.1			24.1	
Actuated g/C Ratio		0.30			0.30			0.46			0.46	
v/c Ratio		0.77			0.18			0.30			0.39	
Control Delay		21.3			12.3			12.8			11.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		21.3			12.3			12.8			11.3	
LOS		C			B			B			B	
Approach Delay		21.3			12.3			12.8			11.3	
Approach LOS		C			B			B			B	
Queue Length 50th (m)		24.2			5.5			10.7			16.1	
Queue Length 95th (m)		50.8			13.2			31.0			44.5	
Internal Link Dist (m)		64.3			201.4			104.5			107.7	
Turn Bay Length (m)												
Base Capacity (vph)		985			1013			619			823	
Starvation Cap Reductn		0			0			0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.42			0.09			0.30			0.39	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 52.9			
Natural Cycle: 45			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 15.7		Intersection LOS: B	
Intersection Capacity Utilization 77.1%		ICU Level of Service D	
Analysis Period (min) 15			

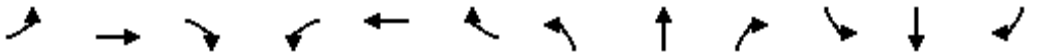
Splits and Phases: 3: Kennedy Road & Old School Road



Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	258	95	328	362
Demand Flow Rate, veh/h	264	95	337	380
Vehicles Circulating, veh/h	276	504	214	40
Vehicles Exiting, veh/h	144	47	326	559
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	24	12	7	21
Ped Cap Adj	0.997	0.998	0.999	0.997
Approach Delay, s/veh	7.8	6.8	8.3	7.1
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	264	95	337	380
Cap Entry Lane, veh/h	857	683	912	1086
Entry HV Adj Factor	0.977	1.000	0.974	0.952
Flow Entry, veh/h	258	95	328	362
Cap Entry, veh/h	835	681	887	1030
V/C Ratio	0.309	0.139	0.370	0.351
Control Delay, s/veh	7.8	6.8	8.3	7.1
LOS	A	A	A	A
95th %tile Queue, veh	1	0	2	2



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	58	95	9	50	9	188	247	7	12	123	208
Future Volume (vph)	117	58	95	9	50	9	188	247	7	12	123	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Satd. Flow (prot)	0	1769	0	0	1873	0	0	1877	0	0	1737	0
Flt Permitted		0.828			0.947			0.724			0.983	
Satd. Flow (perm)	0	1496	0	0	1787	0	0	1388	0	0	1711	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38			9			1			135	
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		88.3			225.4			128.5			131.7	
Travel Time (s)		4.5			11.6			7.7			7.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	1%	0%	0%	0%	0%	0%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	270	0	0	68	0	0	442	0	0	343	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Detector Phase	4	4		8	8		6	6		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	21.3	21.3		21.3	21.3		21.2	21.2		21.2	21.2	
Total Split (s)	35.0	35.0		35.0	35.0		45.0	45.0		45.0	45.0	
Total Split (%)	43.8%	43.8%		43.8%	43.8%		56.3%	56.3%		56.3%	56.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.3			6.3			6.2			6.2	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		15.8			15.8			39.8			39.8	
Actuated g/C Ratio		0.23			0.23			0.58			0.58	
v/c Ratio		0.72			0.16			0.55			0.33	
Control Delay		31.4			18.4			13.2			6.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		31.4			18.4			13.2			6.1	
LOS		C			B			B			A	
Approach Delay		31.4			18.4			13.2			6.1	
Approach LOS		C			B			B			A	
Queue Length 50th (m)		27.9			6.2			31.7			11.6	
Queue Length 95th (m)		51.2			14.9			74.1			32.3	
Internal Link Dist (m)		64.3			201.4			104.5			107.7	
Turn Bay Length (m)												
Base Capacity (vph)		653			759			810			1055	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.41			0.09			0.55			0.33	

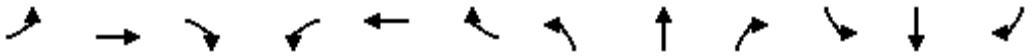
Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 68.2			
Natural Cycle: 55			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 15.7		Intersection LOS: B	
Intersection Capacity Utilization 81.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Kennedy Road & Old School Road

Intersection	
Intersection Delay, s/veh	7.1
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	124	64	213	399
Demand Flow Rate, veh/h	137	69	242	413
Vehicles Circulating, veh/h	293	290	130	65
Vehicles Exiting, veh/h	185	82	300	294
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	25	23	4	50
Ped Cap Adj	0.997	0.997	0.999	0.993
Approach Delay, s/veh	6.5	5.4	6.7	7.8
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	137	69	242	413
Cap Entry Lane, veh/h	843	845	992	1059
Entry HV Adj Factor	0.905	0.927	0.880	0.967
Flow Entry, veh/h	124	64	213	399
Cap Entry, veh/h	760	782	873	1017
V/C Ratio	0.163	0.082	0.244	0.393
Control Delay, s/veh	6.5	5.4	6.7	7.8
LOS	A	A	A	A
95th %tile Queue, veh	1	0	1	2

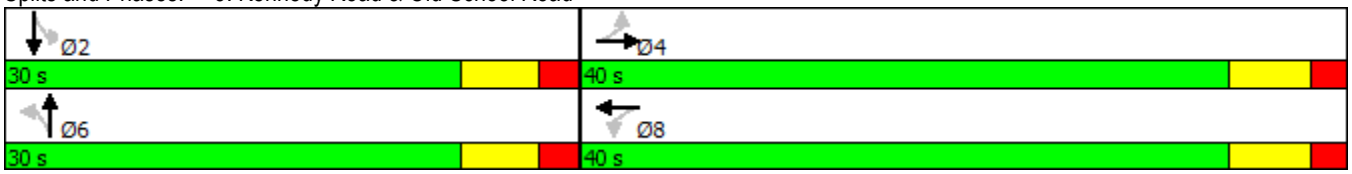


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	138	353	28	104	11	144	122	46	10	224	155
Future Volume (vph)	165	138	353	28	104	11	144	122	46	10	224	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Satd. Flow (prot)	0	1696	0	0	1715	0	0	3261	0	0	3312	0
Flt Permitted		0.869			0.854			0.674			0.944	
Satd. Flow (perm)	0	1492	0	0	1479	0	0	2249	0	0	3130	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		116			8			30			155	
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		88.3			225.4			128.5			131.7	
Travel Time (s)		4.5			11.6			7.7			7.9	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	3%	3%	13%	10%	0%	2%	7%	20%	13%	2%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	656	0	0	143	0	0	312	0	0	389	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Detector Phase	4	4		8	8		6	6		2	2	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.6	27.6		27.6	27.6		21.2	21.2		21.2	21.2	
Total Split (s)	40.0	40.0		40.0	40.0		30.0	30.0		30.0	30.0	
Total Split (%)	57.1%	57.1%		57.1%	57.1%		42.9%	42.9%		42.9%	42.9%	
Yellow Time (s)	4.2	4.2		4.2	4.2		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.2			6.2			6.2			6.2	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		28.6			28.6			24.0			24.0	
Actuated g/C Ratio		0.44			0.44			0.37			0.37	
v/c Ratio		0.91			0.22			0.37			0.31	
Control Delay		32.9			11.1			16.3			10.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		32.9			11.1			16.3			10.3	
LOS		C			B			B			B	
Approach Delay		32.9			11.1			16.3			10.3	
Approach LOS		C			B			B			B	
Queue Length 50th (m)		62.0			10.0			14.7			11.5	
Queue Length 95th (m)		#129.9			20.1			25.7			21.8	
Internal Link Dist (m)		64.3			201.4			104.5			107.7	
Turn Bay Length (m)												
Base Capacity (vph)		836			778			848			1252	
Starvation Cap Reductn		0			0			0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.78			0.18			0.37			0.31	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 65.1			
Natural Cycle: 55			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 21.5		Intersection LOS: C	
Intersection Capacity Utilization 84.2%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

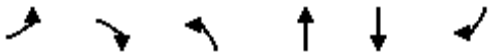
Splits and Phases: 3: Kennedy Road & Old School Road



Intersection	
Intersection Delay, s/veh	9.3
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	261	98	409	494
Demand Flow Rate, veh/h	267	98	419	520
Vehicles Circulating, veh/h	419	585	214	44
Vehicles Exiting, veh/h	145	48	472	639
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	24	12	7	21
Ped Cap Adj	0.997	0.998	0.999	0.997
Approach Delay, s/veh	9.5	7.6	9.7	9.2
Approach LOS	A	A	A	A

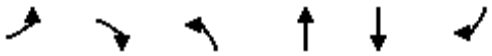
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	267	98	419	520
Cap Entry Lane, veh/h	743	629	912	1081
Entry HV Adj Factor	0.978	1.000	0.975	0.949
Flow Entry, veh/h	261	98	409	494
Cap Entry, veh/h	724	628	889	1024
V/C Ratio	0.360	0.156	0.460	0.482
Control Delay, s/veh	9.5	7.6	9.7	9.2
LOS	A	A	A	A
95th %tile Queue, veh	2	1	2	3



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	55	20	5	257	580	15
Future Volume (Veh/h)	55	20	5	257	580	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	55	20	5	257	580	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					290	
pX, platoon unblocked						
vC, conflicting volume	726	298	595			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	726	298	595			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	85	97	99			
cM capacity (veh/h)	358	699	977			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	75	91	171	387	208
Volume Left	55	5	0	0	0
Volume Right	20	0	0	0	15
cSH	411	977	1700	1700	1700
Volume to Capacity	0.18	0.01	0.10	0.23	0.12
Queue Length 95th (m)	5.3	0.1	0.0	0.0	0.0
Control Delay (s)	15.7	0.5	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	15.7	0.2		0.0	
Approach LOS	C				

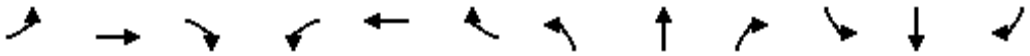
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	27.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	312	595	10
Future Volume (Veh/h)	0	0	0	312	595	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	312	595	10
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					129	
pX, platoon unblocked						
vC, conflicting volume	756	302	605			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	756	302	605			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	344	694	969			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	104	208	397	208
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	10
cSH	1700	969	1700	1700	1700
Volume to Capacity	0.00	0.00	0.12	0.23	0.12
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	0.0	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	20.1%	ICU Level of Service	A
Analysis Period (min)	15		



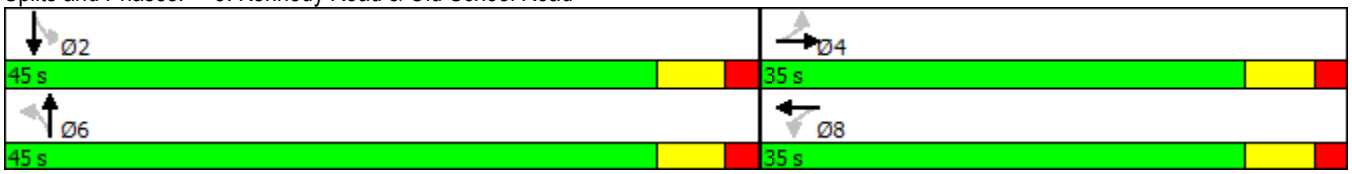
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	124	221	44	150	11	285	296	30	14	148	249
Future Volume (vph)	140	124	221	44	150	11	285	296	30	14	148	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Satd. Flow (prot)	0	1755	0	0	1887	0	0	3541	0	0	3268	0
Flt Permitted		0.831			0.818			0.657			0.929	
Satd. Flow (perm)	0	1479	0	0	1560	0	0	2381	0	0	3042	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		59			4			9			249	
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		88.3			225.4			128.5			131.7	
Travel Time (s)		4.5			11.6			7.7			7.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	1%	0%	0%	0%	0%	0%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	485	0	0	205	0	0	611	0	0	411	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Detector Phase	4	4		8	8		6	6		2	2	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.6	27.6		27.6	27.6		30.6	30.6		30.6	30.6	
Total Split (s)	35.0	35.0		35.0	35.0		45.0	45.0		45.0	45.0	
Total Split (%)	43.8%	43.8%		43.8%	43.8%		56.3%	56.3%		56.3%	56.3%	
Yellow Time (s)	4.2	4.2		4.2	4.2		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.2			6.2			6.2			6.2	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		25.9			25.9			38.9			38.9	
Actuated g/C Ratio		0.34			0.34			0.50			0.50	
v/c Ratio		0.91			0.39			0.51			0.25	
Control Delay		44.5			21.5			15.1			5.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		44.5			21.5			15.1			5.0	
LOS		D			C			B			A	
Approach Delay		44.5			21.5			15.1			5.0	
Approach LOS		D			C			B			A	
Queue Length 50th (m)		62.5			23.2			33.2			7.0	
Queue Length 95th (m)		#119.1			41.0			48.5			14.8	
Internal Link Dist (m)		64.3			201.4			104.5			107.7	
Turn Bay Length (m)												
Base Capacity (vph)		590			586			1204			1656	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.82			0.35			0.51			0.25	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 77.2			
Natural Cycle: 60			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 21.7		Intersection LOS: C	
Intersection Capacity Utilization 87.2%		ICU Level of Service E	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

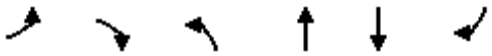
Splits and Phases: 3: Kennedy Road & Old School Road



Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	125	65	298	497
Demand Flow Rate, veh/h	138	70	340	515
Vehicles Circulating, veh/h	396	387	130	67
Vehicles Exiting, veh/h	186	83	404	390
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	25	23	4	50
Ped Cap Adj	0.997	0.997	0.999	0.993
Approach Delay, s/veh	7.3	6.0	8.0	9.4
Approach LOS	A	A	A	A

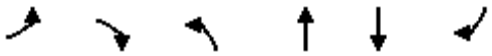
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	138	70	340	515
Cap Entry Lane, veh/h	760	767	992	1057
Entry HV Adj Factor	0.906	0.928	0.876	0.966
Flow Entry, veh/h	125	65	298	497
Cap Entry, veh/h	686	710	869	1014
V/C Ratio	0.182	0.092	0.343	0.491
Control Delay, s/veh	7.3	6.0	8.0	9.4
LOS	A	A	A	A
95th %tile Queue, veh	1	0	2	3



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	15	10	576	333	45
Future Volume (Veh/h)	35	15	10	576	333	45
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	35	15	10	576	333	45
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					290	
pX, platoon unblocked						
vC, conflicting volume	664	189	378			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	664	189	378			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	98	99			
cM capacity (veh/h)	391	821	1177			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	50	202	384	222	156
Volume Left	35	10	0	0	0
Volume Right	15	0	0	0	45
cSH	464	1177	1700	1700	1700
Volume to Capacity	0.11	0.01	0.23	0.13	0.09
Queue Length 95th (m)	2.9	0.2	0.0	0.0	0.0
Control Delay (s)	13.7	0.5	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	13.7	0.2		0.0	
Approach LOS	B				

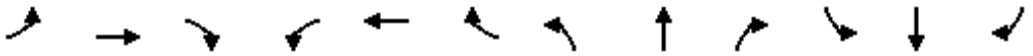
Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	33.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	611	378	35
Future Volume (Veh/h)	0	0	0	611	378	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	611	378	35
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					129	
pX, platoon unblocked						
vC, conflicting volume	701	206	413			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	701	206	413			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	373	800	1142			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	204	407	252	161
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	35
cSH	1700	1142	1700	1700	1700
Volume to Capacity	0.00	0.00	0.24	0.15	0.09
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	0.0	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	20.2%	ICU Level of Service	A
Analysis Period (min)	15		

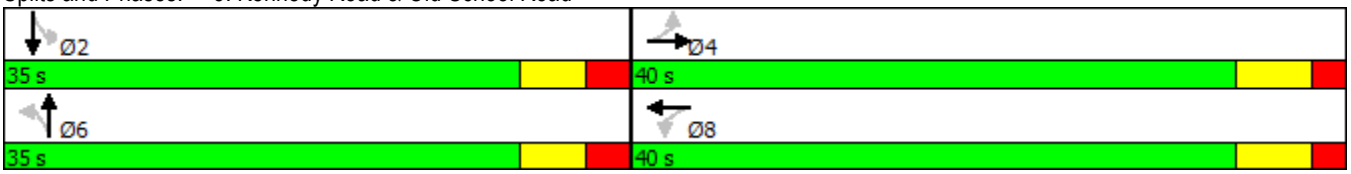


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	143	382	30	112	12	154	134	46	11	248	172
Future Volume (vph)	182	143	382	30	112	12	154	134	46	11	248	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	35.0		0.0	20.0		0.0	60.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1684	3158	0	1580	3298	0	0	3273	0	0	3312	0
Flt Permitted	0.673			0.418				0.658			0.944	
Satd. Flow (perm)	1193	3158	0	695	3298	0	0	2204	0	0	3130	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		382			12			28			172	
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		88.3			225.4			128.5			131.7	
Travel Time (s)		4.5			11.6			7.7			7.9	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	3%	3%	13%	10%	0%	2%	7%	20%	13%	2%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	182	525	0	30	124	0	0	334	0	0	431	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Detector Phase	4	4		8	8		6	6		2	2	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.6	27.6		27.6	27.6		31.7	31.7		31.7	31.7	
Total Split (s)	40.0	40.0		40.0	40.0		35.0	35.0		35.0	35.0	
Total Split (%)	53.3%	53.3%		53.3%	53.3%		46.7%	46.7%		46.7%	46.7%	
Yellow Time (s)	4.2	4.2		4.2	4.2		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2			6.2			6.2	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)	15.1	15.1		15.1	15.1			28.9			28.9	
Actuated g/C Ratio	0.27	0.27		0.27	0.27			0.51			0.51	
v/c Ratio	0.57	0.47		0.16	0.14			0.29			0.26	
Control Delay	25.3	6.2		17.4	14.1			8.8			5.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	25.3	6.2		17.4	14.1			8.8			5.5	
LOS	C	A		B	B			A			A	
Approach Delay		11.1			14.8			8.8			5.5	
Approach LOS		B			B			A			A	
Queue Length 50th (m)	16.8	6.1		2.5	4.7			8.2			6.5	
Queue Length 95th (m)	33.4	16.0		7.9	9.9			20.4			17.4	
Internal Link Dist (m)		64.3			201.4			104.5			107.7	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (m)	35.0			20.0								
Base Capacity (vph)	716	2050		417	1986			1141			1686	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.25	0.26		0.07	0.06			0.29			0.26	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 56.5			
Natural Cycle: 60			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay: 9.5		Intersection LOS: A	
Intersection Capacity Utilization 80.9%		ICU Level of Service D	
Analysis Period (min) 15			

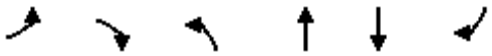
Splits and Phases: 3: Kennedy Road & Old School Road



Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	261	98	445	522
Demand Flow Rate, veh/h	267	98	456	550
Vehicles Circulating, veh/h	449	622	214	44
Vehicles Exiting, veh/h	145	48	502	676
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	24	12	7	21
Ped Cap Adj	0.997	0.998	0.999	0.997
Approach Delay, s/veh	10.0	7.9	10.5	9.7
Approach LOS	A	A	B	A

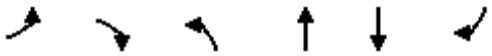
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	267	98	456	550
Cap Entry Lane, veh/h	721	607	912	1081
Entry HV Adj Factor	0.978	1.000	0.976	0.949
Flow Entry, veh/h	261	98	445	522
Cap Entry, veh/h	703	606	889	1023
V/C Ratio	0.371	0.162	0.500	0.510
Control Delay, s/veh	10.0	7.9	10.5	9.7
LOS	A	A	B	A
95th %tile Queue, veh	2	1	3	3



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	55	20	5	280	635	15
Future Volume (Veh/h)	55	20	5	280	635	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	55	20	5	280	635	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					290	
pX, platoon unblocked						
vC, conflicting volume	792	325	650			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	792	325	650			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	83	97	99			
cM capacity (veh/h)	324	671	932			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	75	98	187	423	227
Volume Left	55	5	0	0	0
Volume Right	20	0	0	0	15
cSH	376	932	1700	1700	1700
Volume to Capacity	0.20	0.01	0.11	0.25	0.13
Queue Length 95th (m)	5.9	0.1	0.0	0.0	0.0
Control Delay (s)	16.9	0.5	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	16.9	0.2		0.0	
Approach LOS	C				

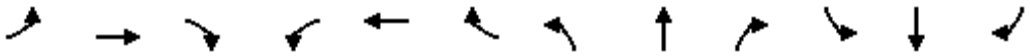
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	335	650	10
Future Volume (Veh/h)	0	0	0	335	650	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	335	650	10
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					129	
pX, platoon unblocked						
vC, conflicting volume	822	330	660			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	822	330	660			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	312	666	924			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	112	223	433	227
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	10
cSH	1700	924	1700	1700	1700
Volume to Capacity	0.00	0.00	0.13	0.25	0.13
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	0.0	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	21.6%	ICU Level of Service	A
Analysis Period (min)	15		

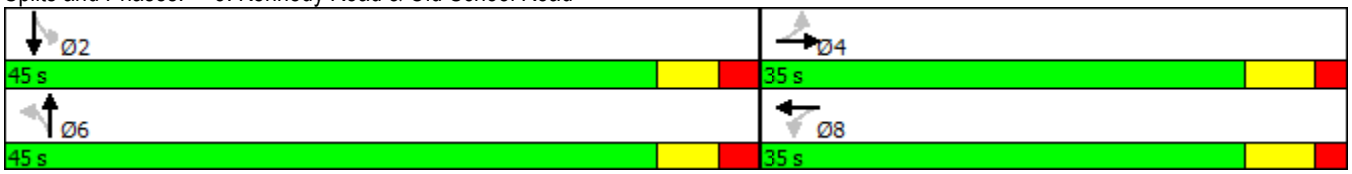


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	132	232	45	156	12	308	327	31	16	163	274
Future Volume (vph)	154	132	232	45	156	12	308	327	31	16	163	274
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	35.0		0.0	20.0		0.0	60.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1767	3255	0	1785	3610	0	0	3541	0	0	3268	0
Flt Permitted	0.646			0.535				0.646			0.926	
Satd. Flow (perm)	1202	3255	0	1005	3610	0	0	2341	0	0	3032	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		232			11			8			274	
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		88.3			225.4			128.5			131.7	
Travel Time (s)		4.5			11.6			7.7			7.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	1%	0%	0%	0%	0%	0%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	154	364	0	45	168	0	0	666	0	0	453	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Detector Phase	4	4		8	8		6	6		2	2	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.6	27.6		27.6	27.6		31.7	31.7		31.7	31.7	
Total Split (s)	35.0	35.0		35.0	35.0		45.0	45.0		45.0	45.0	
Total Split (%)	43.8%	43.8%		43.8%	43.8%		56.3%	56.3%		56.3%	56.3%	
Yellow Time (s)	4.2	4.2		4.2	4.2		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2			6.2			6.2	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)	14.8	14.8		14.8	14.8			38.9			38.9	
Actuated g/C Ratio	0.22	0.22		0.22	0.22			0.59			0.59	
v/c Ratio	0.57	0.40		0.20	0.21			0.48			0.24	
Control Delay	31.8	9.3		22.7	19.7			9.8			3.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	31.8	9.3		22.7	19.7			9.8			3.2	
LOS	C	A		C	B			A			A	
Approach Delay		16.0			20.3			9.8			3.2	
Approach LOS		B			C			A			A	
Queue Length 50th (m)	17.8	7.2		4.7	8.6			21.1			4.3	
Queue Length 95th (m)	34.6	17.1		12.6	15.7			44.3			13.0	
Internal Link Dist (m)		64.3			201.4			104.5			107.7	
Turn Bay Length (m)	35.0			20.0								

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	524	1552		438	1582			1380			1897	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.29	0.23		0.10	0.11			0.48			0.24	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 66.1			
Natural Cycle: 60			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay: 11.1		Intersection LOS: B	
Intersection Capacity Utilization 74.6%		ICU Level of Service D	
Analysis Period (min) 15			

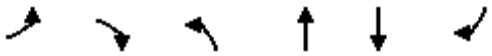
Splits and Phases: 3: Kennedy Road & Old School Road



Intersection	
Intersection Delay, s/veh	8.9
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	125	65	318	524
Demand Flow Rate, veh/h	138	70	363	543
Vehicles Circulating, veh/h	424	410	130	67
Vehicles Exiting, veh/h	186	83	432	413
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	25	23	4	50
Ped Cap Adj	0.997	0.997	0.999	0.993
Approach Delay, s/veh	7.6	6.2	8.4	9.9
Approach LOS	A	A	A	A

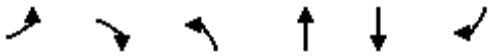
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	138	70	363	543
Cap Entry Lane, veh/h	739	750	992	1057
Entry HV Adj Factor	0.906	0.928	0.875	0.966
Flow Entry, veh/h	125	65	318	524
Cap Entry, veh/h	667	694	868	1014
V/C Ratio	0.187	0.094	0.366	0.517
Control Delay, s/veh	7.6	6.2	8.4	9.9
LOS	A	A	A	A
95th %tile Queue, veh	1	0	2	3



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	15	10	631	360	45
Future Volume (Veh/h)	35	15	10	631	360	45
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	35	15	10	631	360	45
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					290	
pX, platoon unblocked						
vC, conflicting volume	718	202	405			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	718	202	405			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	98	99			
cM capacity (veh/h)	361	805	1150			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	50	220	421	240	165
Volume Left	35	10	0	0	0
Volume Right	15	0	0	0	45
cSH	432	1150	1700	1700	1700
Volume to Capacity	0.12	0.01	0.25	0.14	0.10
Queue Length 95th (m)	3.1	0.2	0.0	0.0	0.0
Control Delay (s)	14.4	0.4	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	14.4	0.2		0.0	
Approach LOS	B				

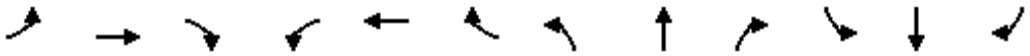
Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	34.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	666	405	35
Future Volume (Veh/h)	0	0	0	666	405	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	666	405	35
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					129	
pX, platoon unblocked						
vC, conflicting volume	756	220	440			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	756	220	440			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	344	784	1116			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	222	444	270	170
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	35
cSH	1700	1116	1700	1700	1700
Volume to Capacity	0.00	0.00	0.26	0.16	0.10
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	0.0	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	21.7%	ICU Level of Service	A
Analysis Period (min)	15		



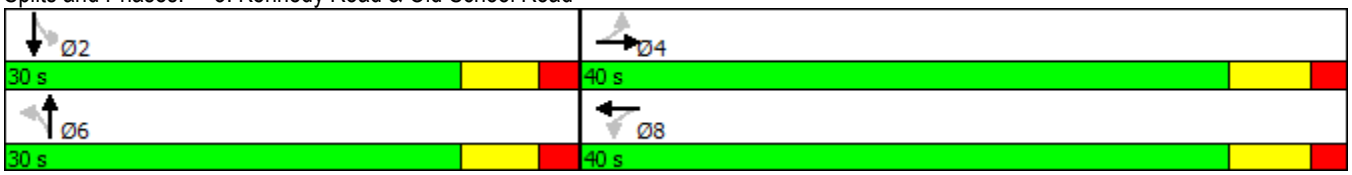
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	157	356	28	107	12	205	128	46	10	226	155
Future Volume (vph)	165	157	356	28	107	12	205	128	46	10	226	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	0.0		0.0	0.0		0.0	90.0		0.0	15.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1700	0	0	1716	0	0	3289	0	0	3316	0
Flt Permitted		0.871			0.852			0.654			0.942	
Satd. Flow (perm)	0	1499	0	0	1475	0	0	2208	0	0	3127	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		110			9			23			155	
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		88.3			225.4			128.5			131.7	
Travel Time (s)		4.5			11.6			7.7			7.9	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	3%	3%	13%	10%	0%	2%	7%	20%	13%	2%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	678	0	0	147	0	0	379	0	0	391	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Detector Phase	4	4		8	8		6	6		2	2	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.6	27.6		27.6	27.6		21.2	21.2		21.2	21.2	
Total Split (s)	40.0	40.0		40.0	40.0		30.0	30.0		30.0	30.0	
Total Split (%)	57.1%	57.1%		57.1%	57.1%		42.9%	42.9%		42.9%	42.9%	
Yellow Time (s)	4.2	4.2		4.2	4.2		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.2			6.2			6.2			6.2	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		29.8			29.8			24.0			24.0	
Actuated g/C Ratio		0.45			0.45			0.36			0.36	
v/c Ratio		0.92			0.22			0.47			0.32	
Control Delay		34.7			10.9			18.6			10.6	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		34.7			10.9			18.6			10.6	
LOS		C			B			B			B	
Approach Delay		34.7			10.9			18.6			10.6	
Approach LOS		C			B			B			B	
Queue Length 50th (m)		67.0			10.2			20.0			12.0	
Queue Length 95th (m)		#137.9			20.4			32.6			22.0	
Internal Link Dist (m)		64.3			201.4			104.5			107.7	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (m)												
Base Capacity (vph)		823			761			812			1229	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.82			0.19			0.47			0.32	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 66.3			
Natural Cycle: 60			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 22.8		Intersection LOS: C	
Intersection Capacity Utilization 85.4%		ICU Level of Service E	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Kennedy Road & Old School Road



Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

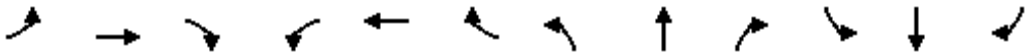
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	261	117	442	577
Demand Flow Rate, veh/h	267	117	456	608
Vehicles Circulating, veh/h	519	606	214	56
Vehicles Exiting, veh/h	145	64	572	667
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	24	12	7	21
Ped Cap Adj	0.997	0.998	0.999	0.997
Approach Delay, s/veh	11.1	8.2	10.6	11.0
Approach LOS	B	A	B	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	267	117	456	608
Cap Entry Lane, veh/h	672	616	912	1068
Entry HV Adj Factor	0.978	1.000	0.970	0.948
Flow Entry, veh/h	261	117	442	577
Cap Entry, veh/h	655	615	884	1010
V/C Ratio	0.398	0.190	0.500	0.571
Control Delay, s/veh	11.1	8.2	10.6	11.0
LOS	B	A	B	B
95th %tile Queue, veh	2	1	3	4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	194	19	5	143	4	14
Future Volume (Veh/h)	194	19	5	143	4	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	194	19	5	143	4	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	226					
pX, platoon unblocked						
vC, conflicting volume			213		356	204
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			213		356	204
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	98
cM capacity (veh/h)			1357		639	837

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	213	148	18
Volume Left	0	5	4
Volume Right	19	0	14
cSH	1700	1357	783
Volume to Capacity	0.13	0.00	0.02
Queue Length 95th (m)	0.0	0.1	0.6
Control Delay (s)	0.0	0.3	9.7
Lane LOS		A	A
Approach Delay (s)	0.0	0.3	9.7
Approach LOS			A

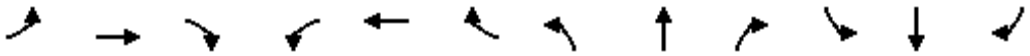
Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		21.6%	ICU Level of Service
Analysis Period (min)		15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	0	20	65	0	47	5	277	7	2	598	15
Future Volume (Veh/h)	55	0	20	65	0	47	5	277	7	2	598	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	55	0	20	65	0	47	5	277	7	2	598	15
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											290	
pX, platoon unblocked												
vC, conflicting volume	805	904	306	614	908	142	613			284		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	805	904	306	614	908	142	613			284		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	79	100	97	82	100	95	99			100		
cM capacity (veh/h)	258	274	689	363	272	880	962			1275		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	75	112	144	146	301	314
Volume Left	55	65	5	0	2	0
Volume Right	20	47	0	7	0	15
cSH	309	482	962	1700	1275	1700
Volume to Capacity	0.24	0.23	0.01	0.09	0.00	0.18
Queue Length 95th (m)	7.4	7.1	0.1	0.0	0.0	0.0
Control Delay (s)	20.3	14.7	0.4	0.0	0.1	0.0
Lane LOS	C	B	A		A	
Approach Delay (s)	20.3	14.7	0.2		0.0	
Approach LOS	C	B				

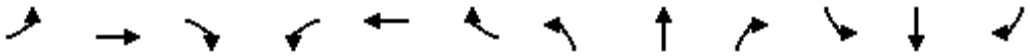
Intersection Summary				
Average Delay	3.0			
Intersection Capacity Utilization	31.9%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	18	0	13	0	366	13	3	597	10
Future Volume (Veh/h)	0	0	0	18	0	13	0	366	13	3	597	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	18	0	13	0	366	13	3	597	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											129	
pX, platoon unblocked												
vC, conflicting volume	804	987	304	677	986	190	607			379		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	804	987	304	677	986	190	607			379		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	95	100	98	100			100		
cM capacity (veh/h)	269	245	693	338	246	820	967			1176		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	31	183	196	302	308
Volume Left	0	18	0	0	3	0
Volume Right	0	13	0	13	0	10
cSH	1700	449	967	1700	1176	1700
Volume to Capacity	0.00	0.07	0.00	0.12	0.00	0.18
Queue Length 95th (m)	0.0	1.8	0.0	0.0	0.1	0.0
Control Delay (s)	0.0	13.6	0.0	0.0	0.1	0.0
Lane LOS	A	B			A	
Approach Delay (s)	0.0	13.6	0.0		0.1	
Approach LOS	A	B				

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	28.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	182	231	44	152	11	324	301	30	14	156	249
Future Volume (vph)	140	182	231	44	152	11	324	301	30	14	156	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	0.0		0.0	0.0		0.0	90.0		0.0	15.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1768	0	0	1887	0	0	3538	0	0	3275	0
Flt Permitted		0.849			0.802			0.648			0.927	
Satd. Flow (perm)	0	1519	0	0	1530	0	0	2349	0	0	3042	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		50			4			8			249	
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		88.3			225.4			128.5			131.7	
Travel Time (s)		4.5			11.6			7.7			7.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	1%	0%	0%	0%	0%	0%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	553	0	0	207	0	0	655	0	0	419	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Detector Phase	4	4		8	8		6	6		2	2	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.6	27.6		27.6	27.6		21.2	21.2		21.2	21.2	
Total Split (s)	35.0	35.0		35.0	35.0		45.0	45.0		45.0	45.0	
Total Split (%)	43.8%	43.8%		43.8%	43.8%		56.3%	56.3%		56.3%	56.3%	
Yellow Time (s)	4.2	4.2		4.2	4.2		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.2			6.2			6.2			6.2	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		28.3			28.3			38.8			38.8	
Actuated g/C Ratio		0.36			0.36			0.49			0.49	
v/c Ratio		0.97			0.38			0.57			0.26	
Control Delay		55.2			21.1			16.8			5.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		55.2			21.1			16.8			5.2	
LOS		E			C			B			A	
Approach Delay		55.2			21.1			16.8			5.2	
Approach LOS		E			C			B			A	
Queue Length 50th (m)		78.4			23.5			36.8			7.4	
Queue Length 95th (m)		#144.9			41.6			53.5			15.3	
Internal Link Dist (m)		64.3			201.4			104.5			107.7	
Turn Bay Length (m)												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)		581			556			1150			1611	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.95			0.37			0.57			0.26	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 79.5			
Natural Cycle: 60			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 26.2		Intersection LOS: C	
Intersection Capacity Utilization 91.8%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Kennedy Road & Old School Road

Intersection	
Intersection Delay, s/veh	9.8
Intersection LOS	A

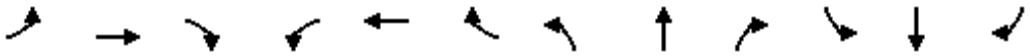
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	125	84	402	547
Demand Flow Rate, veh/h	138	89	459	566
Vehicles Circulating, veh/h	459	485	131	79
Vehicles Exiting, veh/h	186	105	466	495
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	25	23	4	50
Ped Cap Adj	0.997	0.997	0.999	0.993
Approach Delay, s/veh	7.9	7.0	10.0	10.6
Approach LOS	A	A	A	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	138	89	459	566
Cap Entry Lane, veh/h	714	696	991	1044
Entry HV Adj Factor	0.906	0.944	0.876	0.966
Flow Entry, veh/h	125	84	402	547
Cap Entry, veh/h	644	654	868	1001
V/C Ratio	0.194	0.128	0.463	0.546
Control Delay, s/veh	7.9	7.0	10.0	10.6
LOS	A	A	A	B
95th %tile Queue, veh	1	0	2	3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	168	58	16	205	2	9
Future Volume (Veh/h)	168	58	16	205	2	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	168	58	16	205	2	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	226					
pX, platoon unblocked						
vC, conflicting volume			226		434	197
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			226		434	197
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	99
cM capacity (veh/h)			1342		572	844

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	226	221	11
Volume Left	0	16	2
Volume Right	58	0	9
cSH	1700	1342	777
Volume to Capacity	0.13	0.01	0.01
Queue Length 95th (m)	0.0	0.3	0.3
Control Delay (s)	0.0	0.7	9.7
Lane LOS		A	A
Approach Delay (s)	0.0	0.7	9.7
Approach LOS			A

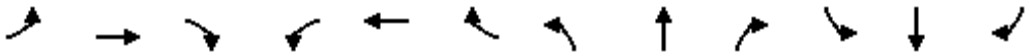
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	34.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	0	15	37	0	32	10	603	64	8	346	46
Future Volume (Veh/h)	35	0	15	37	0	32	10	603	64	8	346	46
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	35	0	15	37	0	32	10	603	64	8	346	46
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											290	
pX, platoon unblocked												
vC, conflicting volume	738	1072	196	859	1063	334	392			667		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	738	1072	196	859	1063	334	392			667		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	100	98	85	100	95	99			99		
cM capacity (veh/h)	287	215	812	242	218	662	1163			919		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	50	69	312	366	181	219
Volume Left	35	37	10	0	8	0
Volume Right	15	32	0	64	0	46
cSH	356	343	1163	1700	919	1700
Volume to Capacity	0.14	0.20	0.01	0.21	0.01	0.13
Queue Length 95th (m)	3.9	5.9	0.2	0.0	0.2	0.0
Control Delay (s)	16.7	18.1	0.3	0.0	0.5	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	16.7	18.1	0.2		0.2	
Approach LOS	C	C				

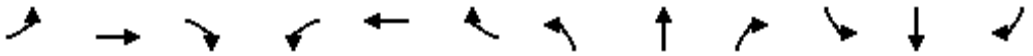
Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	36.8%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	12	0	5	0	650	20	9	387	35
Future Volume (Veh/h)	0	0	0	12	0	5	0	650	20	9	387	35
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	12	0	5	0	650	20	9	387	35
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											129	
pX, platoon unblocked												
vC, conflicting volume	752	1092	211	872	1100	335	422			670		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	752	1092	211	872	1100	335	422			670		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	95	100	99	100			99		
cM capacity (veh/h)	294	211	794	243	209	661	1134			916		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	17	325	345	202	228
Volume Left	0	12	0	0	9	0
Volume Right	0	5	0	20	0	35
cSH	1700	299	1134	1700	916	1700
Volume to Capacity	0.00	0.06	0.00	0.20	0.01	0.13
Queue Length 95th (m)	0.0	1.4	0.0	0.0	0.2	0.0
Control Delay (s)	0.0	17.8	0.0	0.0	0.5	0.0
Lane LOS	A	C			A	
Approach Delay (s)	0.0	17.8	0.0		0.2	
Approach LOS	A	C				

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	28.6%	ICU Level of Service	A	
Analysis Period (min)	15			

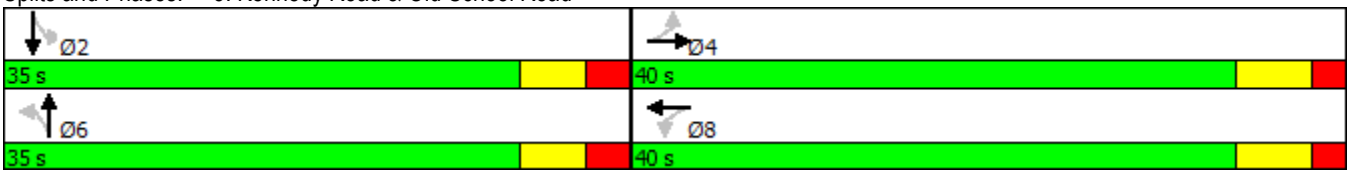


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	169	395	30	124	13	238	144	46	11	251	172
Future Volume (vph)	182	169	395	30	124	13	238	144	46	11	251	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	35.0		0.0	20.0		0.0	95.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1684	3172	0	1580	3300	0	0	3304	0	0	3316	0
Flt Permitted	0.665			0.384				0.635			0.942	
Satd. Flow (perm)	1179	3172	0	638	3300	0	0	2156	0	0	3127	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		395			13			20			172	
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		88.3			225.4			128.5			131.7	
Travel Time (s)		4.5			11.6			7.7			7.9	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	3%	3%	13%	10%	0%	2%	7%	20%	13%	2%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	182	564	0	30	137	0	0	428	0	0	434	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Detector Phase	4	4		8	8		6	6		2	2	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.6	27.6		27.6	27.6		31.7	31.7		31.7	31.7	
Total Split (s)	40.0	40.0		40.0	40.0		35.0	35.0		35.0	35.0	
Total Split (%)	53.3%	53.3%		53.3%	53.3%		46.7%	46.7%		46.7%	46.7%	
Yellow Time (s)	4.2	4.2		4.2	4.2		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2			6.2			6.2	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)	15.4	15.4		15.4	15.4			28.9			28.9	
Actuated g/C Ratio	0.27	0.27		0.27	0.27			0.51			0.51	
v/c Ratio	0.57	0.49		0.17	0.15			0.39			0.26	
Control Delay	25.2	6.6		17.8	14.1			10.2			5.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	25.2	6.6		17.8	14.1			10.2			5.6	
LOS	C	A		B	B			B			A	
Approach Delay		11.2			14.7			10.2			5.6	
Approach LOS		B			B			B			A	
Queue Length 50th (m)	16.9	7.3		2.5	5.3			12.2			7.0	
Queue Length 95th (m)	33.5	17.6		8.0	10.6			28.0			17.7	
Internal Link Dist (m)		64.3			201.4			104.5			107.7	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (m)	35.0			20.0								
Base Capacity (vph)	704	2055		381	1978			1108			1677	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.26	0.27		0.08	0.07			0.39			0.26	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 56.8			
Natural Cycle: 60			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay: 9.9		Intersection LOS: A	
Intersection Capacity Utilization 82.1%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: Kennedy Road & Old School Road



Intersection	
Intersection Delay, s/veh	12.2
Intersection LOS	B

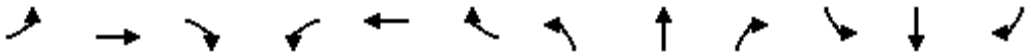
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	261	234	491	541
Demand Flow Rate, veh/h	267	234	508	570
Vehicles Circulating, veh/h	589	647	214	164
Vehicles Exiting, veh/h	145	75	642	717
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	24	12	7	21
Ped Cap Adj	0.997	0.998	0.999	0.997
Approach Delay, s/veh	12.4	12.0	11.9	12.6
Approach LOS	B	B	B	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	267	234	508	570
Cap Entry Lane, veh/h	627	592	912	959
Entry HV Adj Factor	0.978	1.000	0.967	0.949
Flow Entry, veh/h	261	234	491	541
Cap Entry, veh/h	611	591	882	907
V/C Ratio	0.427	0.396	0.557	0.596
Control Delay, s/veh	12.4	12.0	11.9	12.6
LOS	B	B	B	B
95th %tile Queue, veh	2	2	4	4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	200	26	7	154	13	21
Future Volume (Veh/h)	200	26	7	154	13	21
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	200	26	7	154	13	21
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	226					
pX, platoon unblocked						
vC, conflicting volume			226		304	113
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			226		304	113
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	98
cM capacity (veh/h)			1340		660	918

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	133	93	58	103	34
Volume Left	0	0	7	0	13
Volume Right	0	26	0	0	21
cSH	1700	1700	1340	1700	799
Volume to Capacity	0.08	0.05	0.01	0.06	0.04
Queue Length 95th (m)	0.0	0.0	0.1	0.0	1.1
Control Delay (s)	0.0	0.0	1.0	0.0	9.7
Lane LOS			A		A
Approach Delay (s)	0.0		0.3		9.7
Approach LOS					A

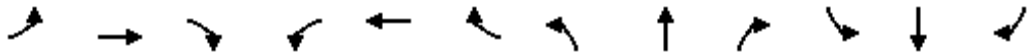
Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	19.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	0	20	2	0	15	5	319	2	2	653	20
Future Volume (Veh/h)	62	0	20	2	0	15	5	319	2	2	653	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	62	0	20	2	0	15	5	319	2	2	653	20
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											290	
pX, platoon unblocked												
vC, conflicting volume	852	998	336	680	1007	160	673			321		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	852	998	336	680	1007	160	673			321		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	75	100	97	99	100	98	99			100		
cM capacity (veh/h)	247	241	659	325	238	856	914			1236		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	82	17	164	162	328	346
Volume Left	62	2	5	0	2	0
Volume Right	20	15	0	2	0	20
cSH	292	718	914	1700	1236	1700
Volume to Capacity	0.28	0.02	0.01	0.10	0.00	0.20
Queue Length 95th (m)	9.0	0.6	0.1	0.0	0.0	0.0
Control Delay (s)	22.1	10.1	0.3	0.0	0.1	0.0
Lane LOS	C	B	A		A	
Approach Delay (s)	22.1	10.1	0.2		0.0	
Approach LOS	C	B				

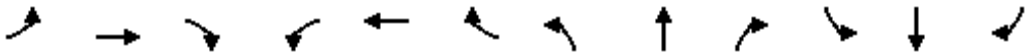
Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	38.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	5	0	23	3	63	0	366	30	14	652	10
Future Volume (Veh/h)	0	5	0	23	3	63	0	366	30	14	652	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	5	0	23	3	63	0	366	30	14	652	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											129	
pX, platoon unblocked												
vC, conflicting volume	932	1081	331	738	1071	198	662			396		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	932	1081	331	738	1071	198	662			396		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	98	100	92	99	92	100			99		
cM capacity (veh/h)	200	214	665	298	217	810	922			1159		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	5	89	183	213	340	336
Volume Left	0	23	0	0	14	0
Volume Right	0	63	0	30	0	10
cSH	214	527	922	1700	1159	1700
Volume to Capacity	0.02	0.17	0.00	0.13	0.01	0.20
Queue Length 95th (m)	0.6	4.8	0.0	0.0	0.3	0.0
Control Delay (s)	22.2	13.2	0.0	0.0	0.5	0.0
Lane LOS	C	B			A	
Approach Delay (s)	22.2	13.2	0.0		0.2	
Approach LOS	C	B				

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	47.0%	ICU Level of Service	A	
Analysis Period (min)	15			

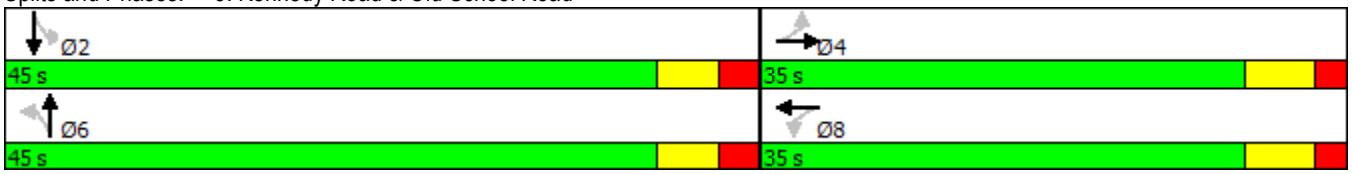


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	151	235	45	159	13	369	333	31	16	165	274
Future Volume (vph)	154	151	235	45	159	13	369	333	31	16	165	274
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	35.0		0.0	20.0		0.0	95.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1767	3272	0	1785	3610	0	0	3538	0	0	3272	0
Flt Permitted	0.643			0.512				0.636			0.923	
Satd. Flow (perm)	1196	3272	0	962	3610	0	0	2308	0	0	3026	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		235			12			8			274	
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		88.3			225.4			128.5			131.7	
Travel Time (s)		4.5			11.6			7.7			7.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	1%	0%	0%	0%	0%	0%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	154	386	0	45	172	0	0	733	0	0	455	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Detector Phase	4	4		8	8		6	6		2	2	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.6	27.6		27.6	27.6		31.7	31.7		31.7	31.7	
Total Split (s)	35.0	35.0		35.0	35.0		45.0	45.0		45.0	45.0	
Total Split (%)	43.8%	43.8%		43.8%	43.8%		56.3%	56.3%		56.3%	56.3%	
Yellow Time (s)	4.2	4.2		4.2	4.2		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.2	6.2		6.2	6.2			6.2			6.2	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)	14.8	14.8		14.8	14.8			38.9			38.9	
Actuated g/C Ratio	0.22	0.22		0.22	0.22			0.59			0.59	
v/c Ratio	0.57	0.42		0.21	0.21			0.54			0.24	
Control Delay	31.8	9.9		22.9	19.6			10.6			3.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	31.8	9.9		22.9	19.6			10.6			3.2	
LOS	C	A		C	B			B			A	
Approach Delay		16.1			20.3			10.6			3.2	
Approach LOS		B			C			B			A	
Queue Length 50th (m)	17.8	8.3		4.7	8.8			24.4			4.4	
Queue Length 95th (m)	34.7	18.6		12.6	16.0			51.3			13.2	
Internal Link Dist (m)		64.3			201.4			104.5			107.7	
Turn Bay Length (m)	35.0			20.0								

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	522	1559		419	1582			1360			1891	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.30	0.25		0.11	0.11			0.54			0.24	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 66.2			
Natural Cycle: 60			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay: 11.5		Intersection LOS: B	
Intersection Capacity Utilization 77.2%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Kennedy Road & Old School Road



Intersection	
Intersection Delay, s/veh	10.3
Intersection LOS	B

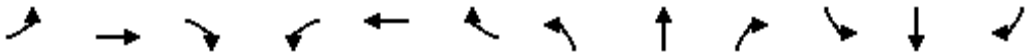
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	125	84	351	607
Demand Flow Rate, veh/h	138	89	401	629
Vehicles Circulating, veh/h	522	434	130	79
Vehicles Exiting, veh/h	186	97	530	444
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	25	23	4	50
Ped Cap Adj	0.997	0.997	0.999	0.993
Approach Delay, s/veh	8.5	6.6	8.9	12.0
Approach LOS	A	A	A	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	138	89	401	629
Cap Entry Lane, veh/h	670	732	992	1044
Entry HV Adj Factor	0.906	0.944	0.876	0.965
Flow Entry, veh/h	125	84	351	607
Cap Entry, veh/h	605	689	869	1001
V/C Ratio	0.207	0.122	0.404	0.607
Control Delay, s/veh	8.5	6.6	8.9	12.0
LOS	A	A	A	B
95th %tile Queue, veh	1	0	2	4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	179	19	5	213	4	14
Future Volume (Veh/h)	179	19	5	213	4	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	179	19	5	213	4	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	226					
pX, platoon unblocked						
vC, conflicting volume			198		305	99
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			198		305	99
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1372		660	937

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	119	79	76	142	18
Volume Left	0	0	5	0	4
Volume Right	0	19	0	0	14
cSH	1700	1700	1372	1700	857
Volume to Capacity	0.07	0.05	0.00	0.08	0.02
Queue Length 95th (m)	0.0	0.0	0.1	0.0	0.5
Control Delay (s)	0.0	0.0	0.5	0.0	9.3
Lane LOS			A		A
Approach Delay (s)	0.0		0.2		9.3
Approach LOS					A

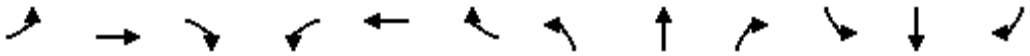
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	19.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	0	15	65	0	47	10	651	7	2	378	45
Future Volume (Veh/h)	35	0	15	65	0	47	10	651	7	2	378	45
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	35	0	15	65	0	47	10	651	7	2	378	45
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											290	
pX, platoon unblocked												
vC, conflicting volume	797	1082	212	882	1102	329	423			658		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	797	1082	212	882	1102	329	423			658		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	86	100	98	72	100	93	99			100		
cM capacity (veh/h)	256	214	794	234	208	667	1133			926		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	50	112	336	332	191	234
Volume Left	35	65	10	0	2	0
Volume Right	15	47	0	7	0	45
cSH	321	322	1133	1700	926	1700
Volume to Capacity	0.16	0.35	0.01	0.20	0.00	0.14
Queue Length 95th (m)	4.4	12.1	0.2	0.0	0.1	0.0
Control Delay (s)	18.3	22.1	0.3	0.0	0.1	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	18.3	22.1	0.2		0.1	
Approach LOS	C	C				

Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	39.0%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	18	0	13	0	720	13	3	407	35
Future Volume (Veh/h)	0	0	0	18	0	13	0	720	13	3	407	35
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	18	0	13	0	720	13	3	407	35
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											129	
pX, platoon unblocked												
vC, conflicting volume	804	1164	221	936	1174	366	442			733		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	804	1164	221	936	1174	366	442			733		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	92	100	98	100			100		
cM capacity (veh/h)	268	193	783	219	190	630	1114			868		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	31	360	373	206	238
Volume Left	0	18	0	0	3	0
Volume Right	0	13	0	13	0	35
cSH	1700	302	1114	1700	868	1700
Volume to Capacity	0.00	0.10	0.00	0.22	0.00	0.14
Queue Length 95th (m)	0.0	2.7	0.0	0.0	0.1	0.0
Control Delay (s)	0.0	18.3	0.0	0.0	0.2	0.0
Lane LOS	A	C			A	
Approach Delay (s)	0.0	18.3	0.0		0.1	
Approach LOS	A	C				

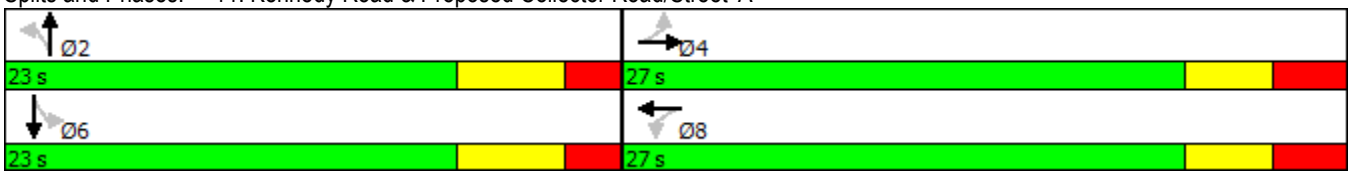
Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	30.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	0	20	2	0	15	5	319	2	2	653	20
Future Volume (vph)	62	0	20	2	0	15	5	319	2	2	653	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Satd. Flow (prot)	0	1756	0	0	1649	0	0	3571	0	0	3564	0
Flt Permitted		0.768			0.944			0.945			0.954	
Satd. Flow (perm)	0	1399	0	0	1566	0	0	3378	0	0	3400	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		70			70			1			6	
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		109.3			133.4			182.8			162.1	
Travel Time (s)		7.9			9.6			11.0			9.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	82	0	0	17	0	0	326	0	0	675	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		21.2	21.2		21.2	21.2	
Total Split (s)	27.0	27.0		27.0	27.0		23.0	23.0		23.0	23.0	
Total Split (%)	54.0%	54.0%		54.0%	54.0%		46.0%	46.0%		46.0%	46.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.8	2.8		2.8	2.8		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.1			6.1			6.2			6.2	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		8.1			8.1			28.2			28.2	
Actuated g/C Ratio		0.20			0.20			0.70			0.70	
v/c Ratio		0.24			0.05			0.14			0.28	
Control Delay		7.3			0.2			4.8			5.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		7.3			0.2			4.8			5.3	
LOS		A			A			A			A	
Approach Delay		7.3			0.2			4.8			5.3	
Approach LOS		A			A			A			A	
Queue Length 50th (m)		0.9			0.0			6.0			13.8	
Queue Length 95th (m)		7.4			0.2			11.1			22.8	
Internal Link Dist (m)		85.3			109.4			158.8			138.1	
Turn Bay Length (m)												
Base Capacity (vph)		768			856			2372			2389	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.11			0.02			0.14			0.28	

Intersection Summary			
Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 40.1			
Natural Cycle: 50			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.28			
Intersection Signal Delay: 5.2		Intersection LOS: A	
Intersection Capacity Utilization 41.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 11: Kennedy Road & Proposed Collector Road/Street 'A'

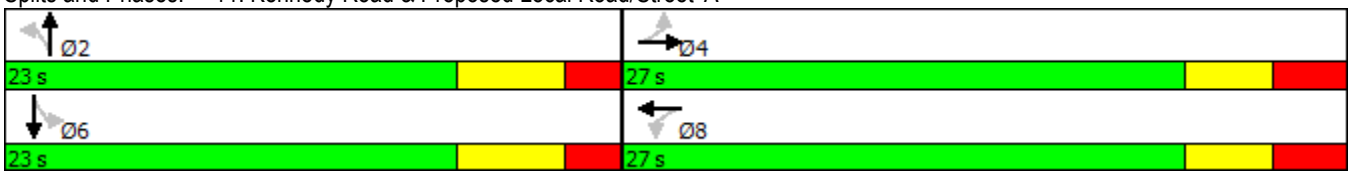


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	0	15	65	0	47	10	651	7	2	378	45
Future Volume (vph)	35	0	15	65	0	47	10	651	7	2	378	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Satd. Flow (prot)	0	1745	0	0	1726	0	0	3568	0	0	3521	0
Flt Permitted		0.722			0.793			0.947			0.952	
Satd. Flow (perm)	0	1304	0	0	1408	0	0	3382	0	0	3352	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		70			70			2			27	
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		109.3			133.4			258.7			162.1	
Travel Time (s)		7.9			9.6			15.5			9.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	50	0	0	112	0	0	668	0	0	425	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		21.2	21.2		21.2	21.2	
Total Split (s)	27.0	27.0		27.0	27.0		23.0	23.0		23.0	23.0	
Total Split (%)	54.0%	54.0%		54.0%	54.0%		46.0%	46.0%		46.0%	46.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.8	2.8		2.8	2.8		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.1			6.1			6.2			6.2	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		8.3			8.3			25.6			25.6	
Actuated g/C Ratio		0.22			0.22			0.67			0.67	
v/c Ratio		0.15			0.31			0.29			0.19	
Control Delay		4.2			8.9			5.9			5.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		4.2			8.9			5.9			5.2	
LOS		A			A			A			A	
Approach Delay		4.2			8.9			5.9			5.2	
Approach LOS		A			A			A			A	
Queue Length 50th (m)		0.0			2.4			13.8			7.5	
Queue Length 95th (m)		4.0			10.5			24.8			14.7	
Internal Link Dist (m)		85.3			109.4			234.7			138.1	
Turn Bay Length (m)												
Base Capacity (vph)		747			804			2275			2263	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.07			0.14			0.29			0.19	

Intersection Summary			
Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 38.1			
Natural Cycle: 50			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.31			
Intersection Signal Delay: 5.9		Intersection LOS: A	
Intersection Capacity Utilization 42.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 11: Kennedy Road & Proposed Local Road/Street 'A'



APPENDIX G

RELEVANT EXCERPTS FROM THE ITE TRIP GENERATION MANUAL

Land Use: 210
Single-Family Detached Housing

Description

A single-family detached housing site includes any single-family detached home on an individual lot. A typical site surveyed is a suburban subdivision.

Specialized Land Use

Data have been submitted for several single-family detached housing developments with homes that are commonly referred to as patio homes. A patio home is a detached housing unit that is located on a small lot with little (or no) front or back yard. In some subdivisions, communal maintenance of outside grounds is provided for the patio homes. The three patio home sites total 299 dwelling units with overall weighted average trip generation rates of 5.35 vehicle trips per dwelling unit for weekday, 0.26 for the AM adjacent street peak hour, and 0.47 for the PM adjacent street peak hour. These patio home rates based on a small sample of sites are lower than those for single-family detached housing (Land Use 210), lower than those for single-family attached housing (Land Use 251), and higher than those for senior adult housing -- single-family (Land Use 251). Further analysis of this housing type will be conducted in a future edition of *Trip Generation Manual*.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

For 30 of the study sites, data on the number of residents and number of household vehicles are available. The overall averages for the 30 sites are 3.6 residents per dwelling unit and 1.5 vehicles per dwelling unit.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Arizona, California, Connecticut, Delaware, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Minnesota, Montana, New Jersey, North Carolina, Ohio, Ontario (CAN), Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Vermont, Virginia, and West Virginia.

Source Numbers

100, 105, 114, 126, 157, 167, 177, 197, 207, 211, 217, 267, 275, 293, 300, 319, 320, 356, 357, 367, 384, 387, 407, 435, 522, 550, 552, 579, 598, 601, 603, 614, 637, 711, 716, 720, 728, 735, 868, 869, 903, 925, 936, 1005, 1007, 1008, 1010, 1033, 1066, 1077,1078, 1079

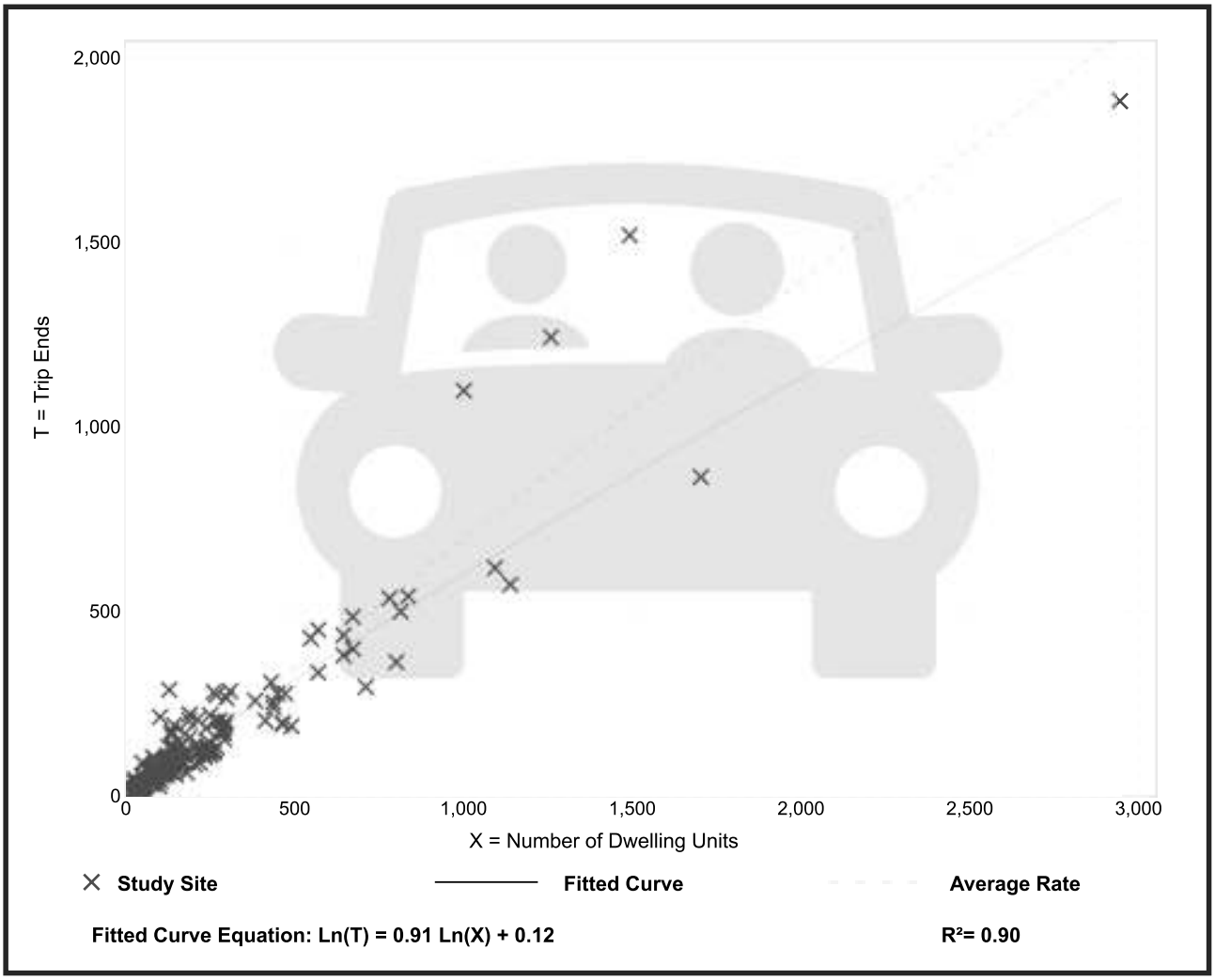
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs:	**Dwelling Units**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 7 and 9 a.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	192
Avg. Num. of Dwelling Units:	226
Directional Distribution:	26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

Data Plot and Equation



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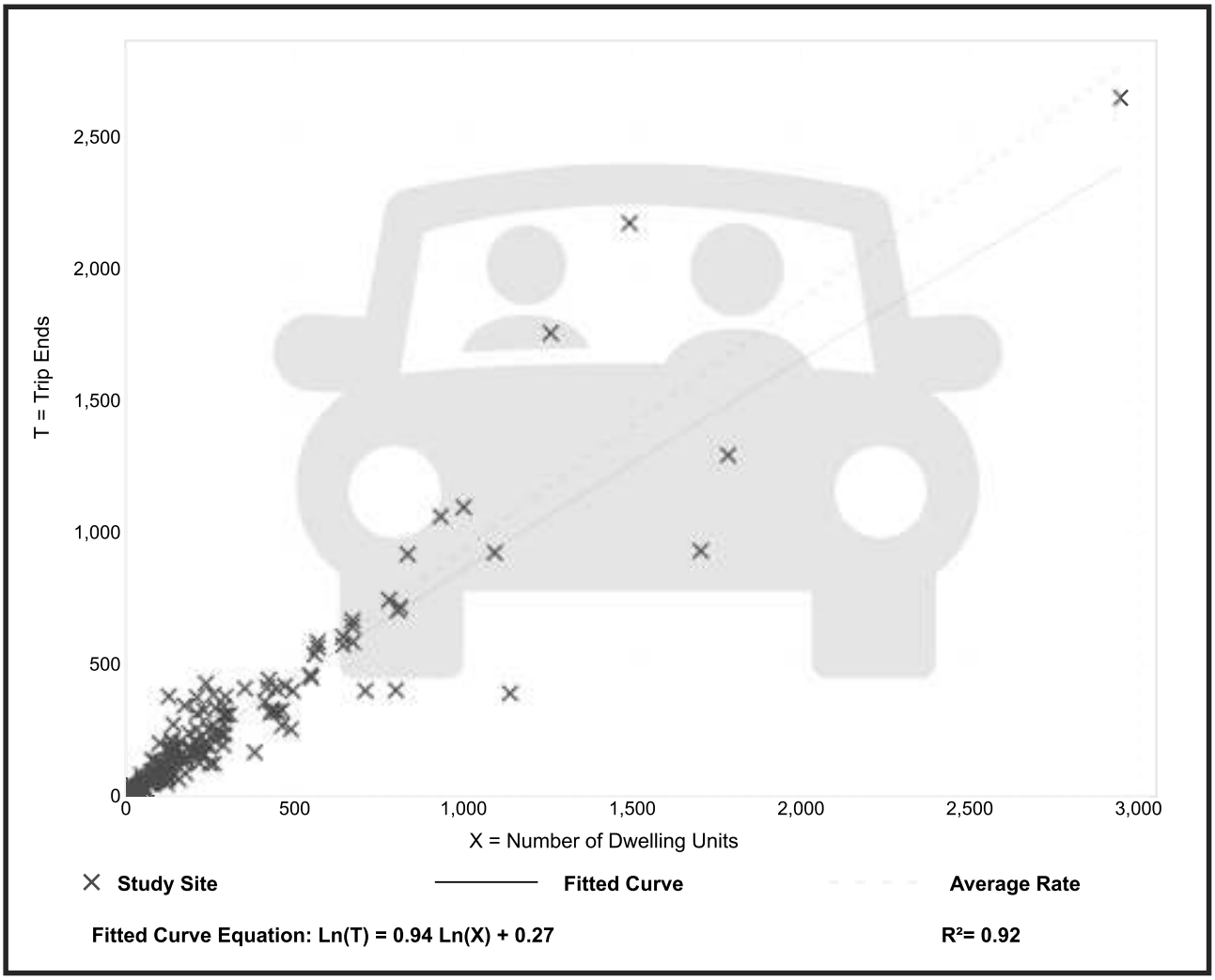
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs:	**Dwelling Units**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	208
Avg. Num. of Dwelling Units:	248
Directional Distribution:	63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation



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Land Use: 215
Single-Family Attached Housing

Description

Single-family attached housing includes any single-family housing unit that shares a wall with an adjoining dwelling unit, whether the walls are for living space, a vehicle garage, or storage space.

Additional Data

The database for this land use includes duplexes (defined as a single structure with two distinct dwelling units, typically joined side-by-side and each with at least one outside entrance) and townhouses/rowhouses (defined as a single structure with three or more distinct dwelling units, joined side-by-side in a row and each with an outside entrance).

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in British Columbia (CAN), California, Georgia, Illinois, Maryland, Massachusetts, Minnesota, New Jersey, Ontario (CAN), Oregon, Pennsylvania, South Dakota, Utah, Virginia, and Wisconsin.

Source Numbers

168, 204, 211, 237, 305, 306, 319, 321, 357, 390, 418, 525, 571, 583, 638, 735, 868, 869, 870, 896, 912, 959, 1009, 1046, 1056, 1058, 1077

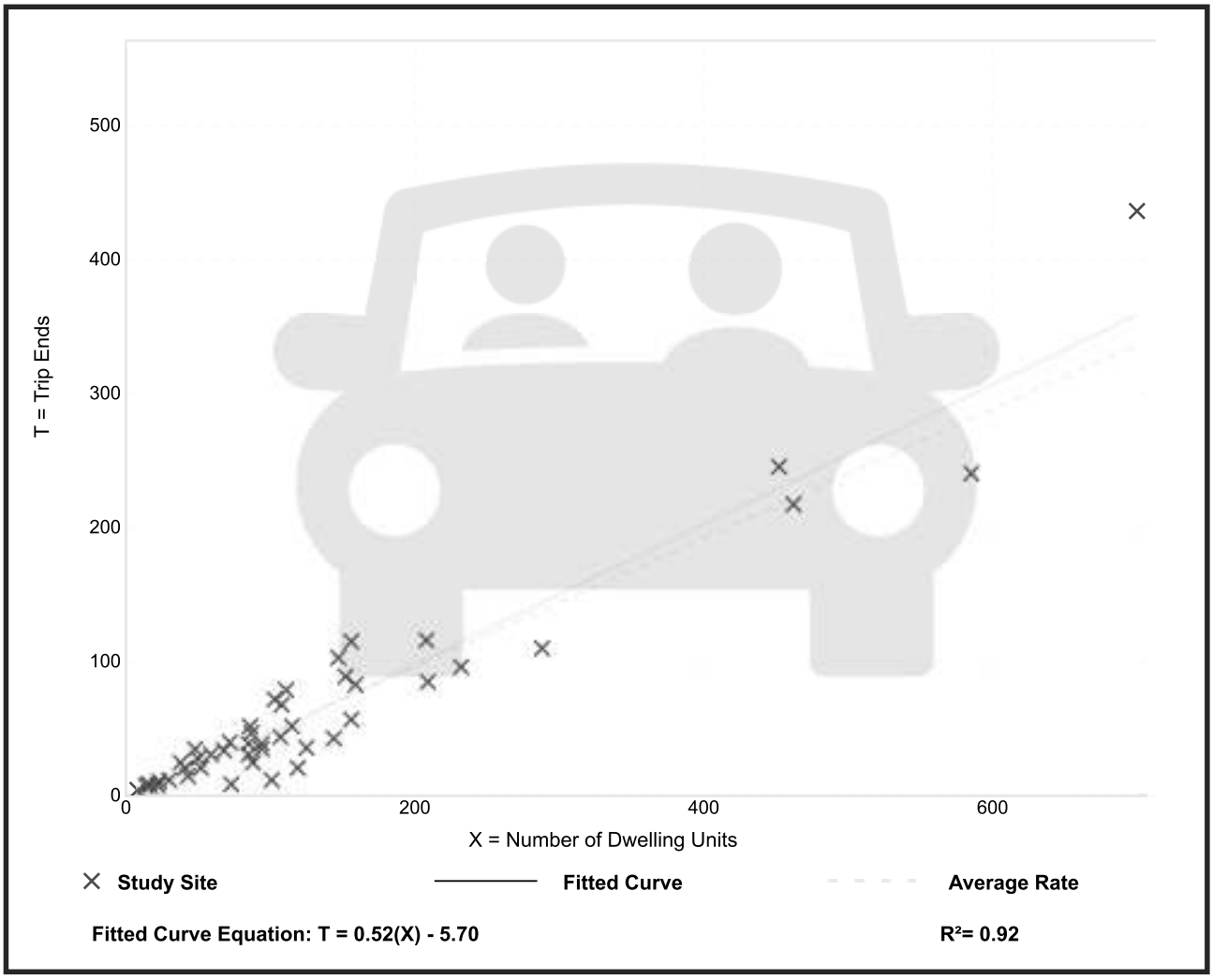
Single-Family Attached Housing
(215)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 46
Avg. Num. of Dwelling Units: 135
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.48	0.12 - 0.74	0.14

Data Plot and Equation



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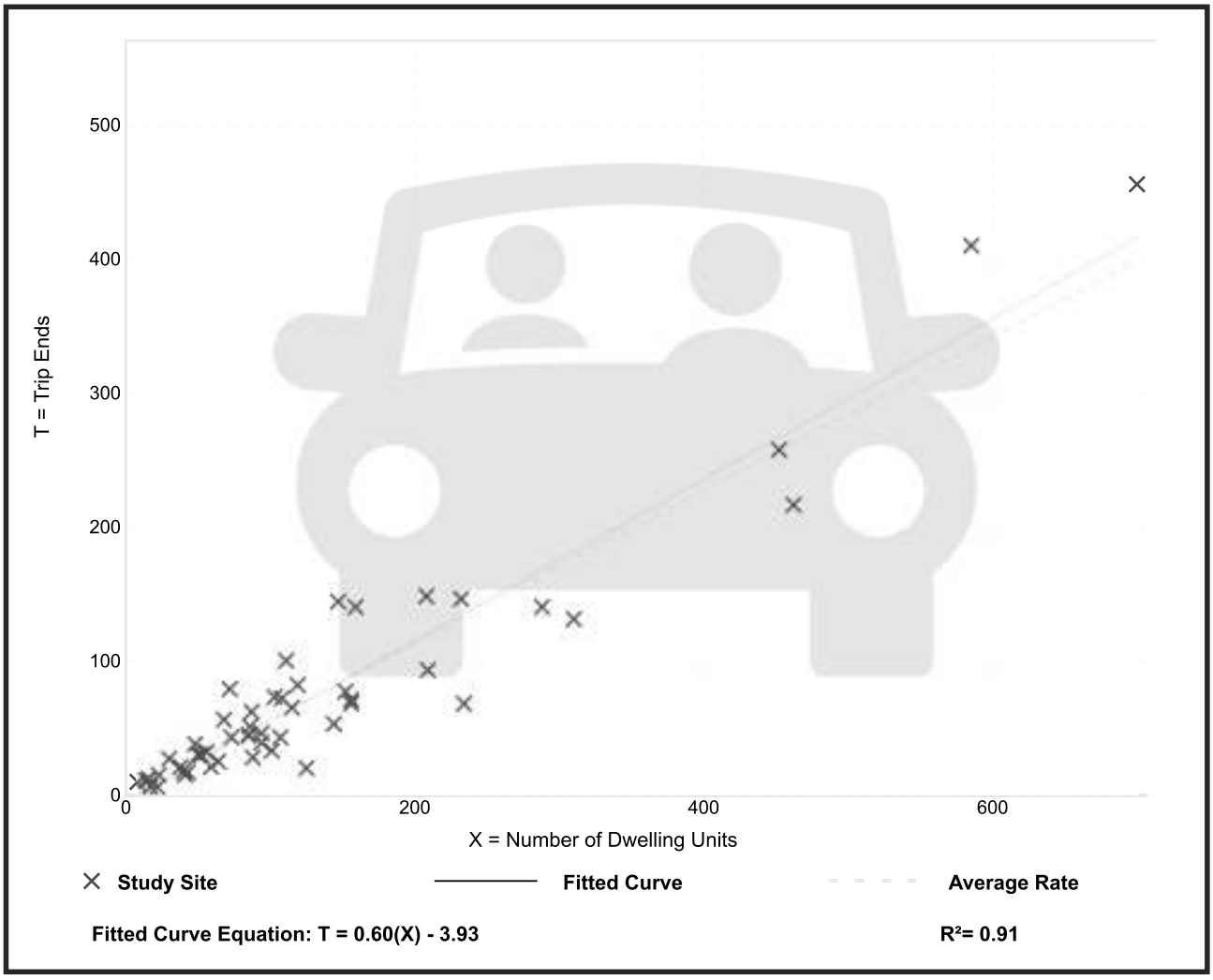
Single-Family Attached Housing
(215)

Vehicle Trip Ends vs:	**Dwelling Units**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	51
Avg. Num. of Dwelling Units:	136
Directional Distribution:	59% entering, 41% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.17 - 1.25	0.18

Data Plot and Equation



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Land Use: 220
Multifamily Housing (Low-Rise)

Description

Low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have two or three floors (levels). Various configurations fit this description, including walkup apartment, mansion apartment, and stacked townhouse.

- A walkup apartment typically is two or three floors in height with dwelling units that are accessed by a single or multiple entrances with stairways and hallways.

- A mansion apartment is a single structure that contains several apartments within what appears to be a single-family dwelling unit.

- A fourplex is a single two-story structure with two matching dwelling units on the ground and second floors. Access to the individual units is typically internal to the structure and provided through a central entry and stairway.

- A stacked townhouse is designed to match the external appearance of a townhouse. But, unlike a townhouse dwelling unit that only shares walls with an adjoining unit, the stacked townhouse units share both floors and walls. Access to the individual units is typically internal to the structure and provided through a central entry and stairway.

Multifamily housing (mid-rise) (Land Use 221), multifamily housing (high-rise) (Land Use 222), affordable housing (Land Use 223), and off-campus student apartment (low-rise) (Land Use 225) are related land uses.

Land Use Subcategory

Data are presented for two subcategories for this land use: (1) not close to rail transit and (2) close to rail transit. A site is considered close to rail transit if the walking distance between the residential site entrance and the closest rail transit station entrance is ½ mile or less.

Additional Data

For the three sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.72 residents per occupied dwelling unit.

For the two sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 96.2 percent of the total dwelling units were occupied.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip

generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

For the three sites for which data were provided for both occupied dwelling units and residents, there was an average of 2.72 residents per occupied dwelling unit.

It is expected that the number of bedrooms and number of residents are likely correlated to the trips generated by a residential site. To assist in future analysis, trip generation studies of all multifamily housing should attempt to obtain information on occupancy rate and on the mix of residential unit sizes (i.e., number of units by number of bedrooms at the site complex).

The sites were surveyed in the 1980s, the 1990s, the 2000s, the 2010s, and the 2020s in British Columbia (CAN), California, Delaware, Florida, Georgia, Illinois, Indiana, Maine, Maryland, Massachusetts, Minnesota, New Jersey, Ontario (CAN), Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, and Washington.

Source Numbers

188, 204, 237, 300, 305, 306, 320, 321, 357, 390, 412, 525, 530, 579, 583, 638, 864, 866, 896, 901, 903, 904, 936, 939, 944, 946, 947, 948, 963, 964, 966, 967, 1012, 1013, 1014, 1036, 1047, 1056, 1071, 1076

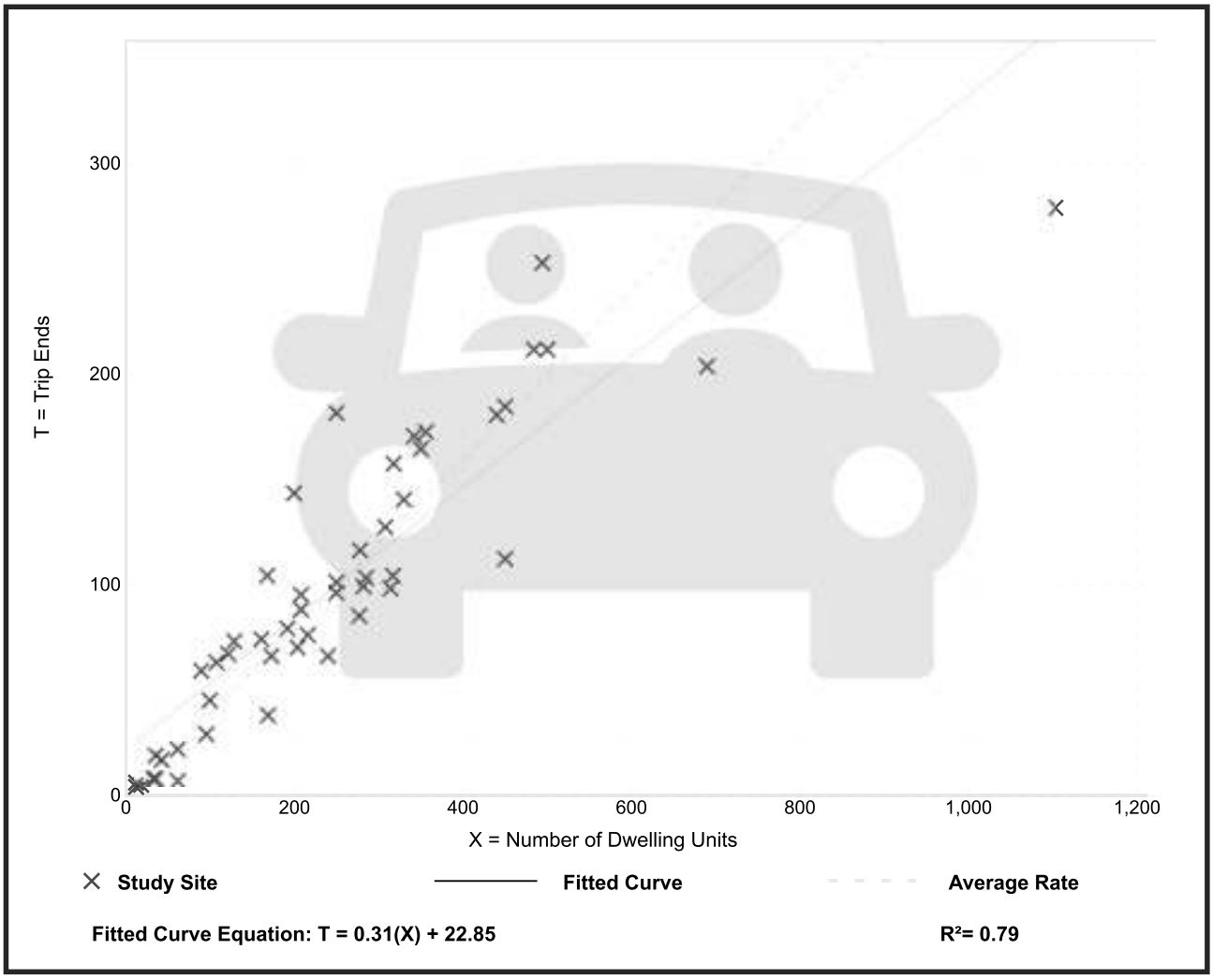
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

Vehicle Trip Ends vs:	**Dwelling Units**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 7 and 9 a.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	49
Avg. Num. of Dwelling Units:	249
Directional Distribution:	24% entering, 76% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.40	0.13 - 0.73	0.12

Data Plot and Equation



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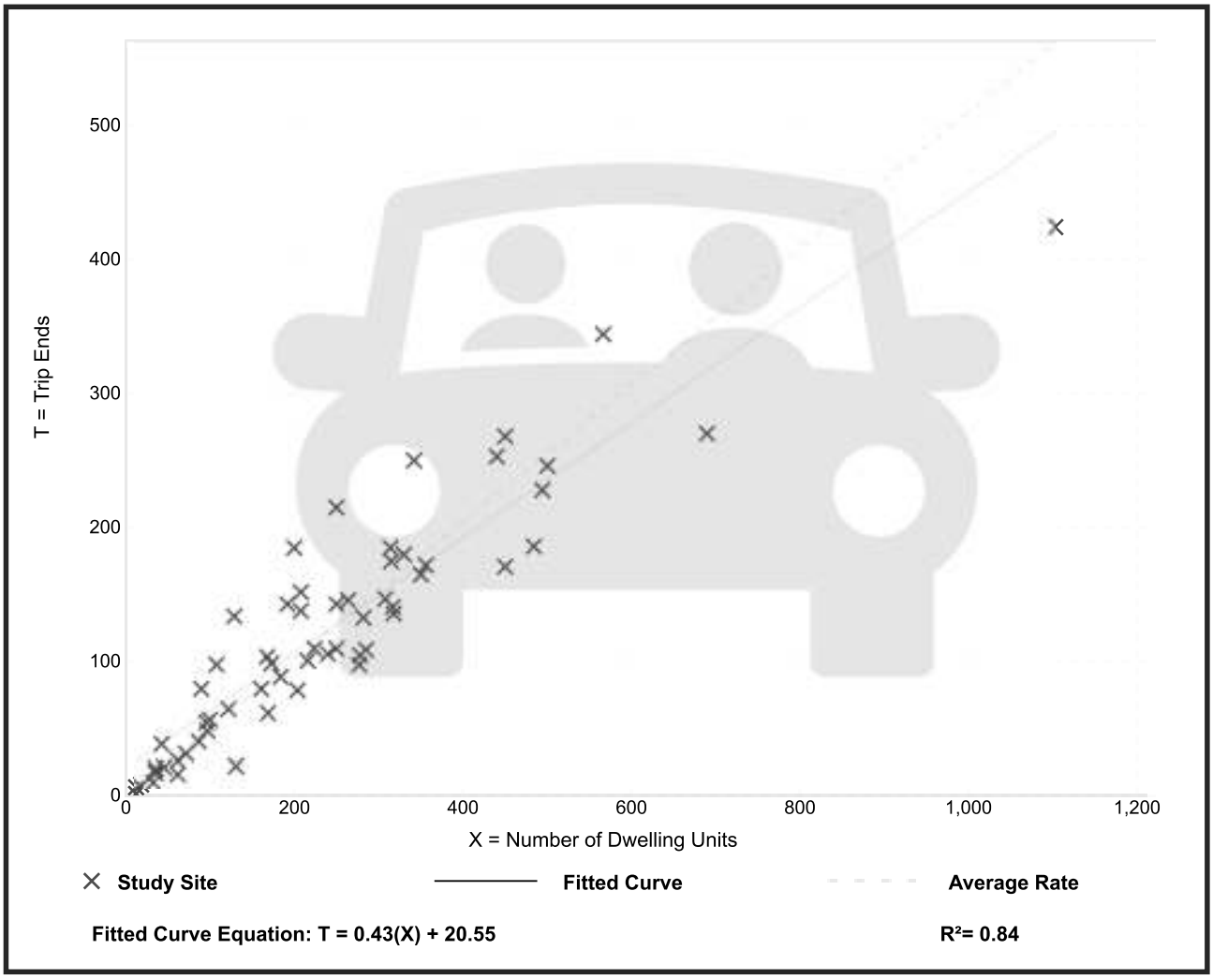
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

Vehicle Trip Ends vs:	**Dwelling Units**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	59
Avg. Num. of Dwelling Units:	241
Directional Distribution:	63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.51	0.08 - 1.04	0.15

Data Plot and Equation



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APPENDIX H

TRIP ASSIGNMENT ASSUMPTIONS AND CALCULATIONS

2016 HOME-TO-WORK MATRIX FOR 36 MUNICIPALITIES - A.M PEAK

SURVEY: 2016
PURPOSE: WORK
MODE: ALL
PERIOD: 6:00 - 8:59 A.M.

		TO: TORONTO						DURHAM								YORK									
FROM:		Toronto 1	East York 2	York 3	North York 4	Etobicoke 5	Scarborough 6	Brock 7	Uxbridge 8	Scugog 9	Pickering 10	Ajax 11	Whitby 12	Oshawa 13	Clarington 14	Georgina 15	E. Gwill. 16	Newmkt 17	Aurora 18	Richm.Hll 19	Whit-Sto 20	Markham 21	King 22	Vaughan 23	
TORONTO																									
Toronto	1	170,400	2,900	2,500	26,300	8,400	7,100	*	100	*	700	200	300	600	100	*	100	400	300	1,700	100	5,100	*	4,300	1
East York	2	16,200	1,600	200	3,900	800	2,200	*	*	*	200	*	100	100	*	*	*	100	*	200	*	1,300	*	700	2
York	3	17,700	400	1,900	6,200	2,700	1,200	*	*	*	*	*	100	100	*	*	*	*	100	400	*	600	*	1,600	3
North York	4	58,200	2,200	2,300	47,300	7,800	9,600	*	100	*	600	300	200	600	100	*	*	500	500	3,900	300	8,400	100	13,300	4
Etobicoke	5	32,100	300	1,700	9,500	18,900	1,600	*	*	*	100	*	*	100	*	*	100	100	200	800	*	1,300	*	4,900	5
Scarborough	6	42,900	3,100	700	21,000	2,900	39,400	*	200	*	1,600	700	700	700	200	*	100	200	500	2,700	200	12,100	*	4,100	6
DURHAM																									
Brock	7	100	*	*	100	*	*	600	200	200	*	*	*	100	*	100	100	200	*	100	*	200	*	*	7
Uxbridge	8	500	*	*	100	*	500	100	1,100	200	100	100	300	*	*	100	*	300	200	200	400	900	*	200	8
Scugog	9	400	100	*	200	*	200	*	300	900	100	100	500	700	200	*	*	*	100	100	*	200	*	100	9
Pickering	10	5,600	200	200	3,600	300	4,900	*	*	200	3,100	1,200	500	700	100	*	*	100	200	300	100	2,500	*	500	10
Ajax	11	5,900	200	100	4,500	400	5,900	*	*	100	2,400	3,600	1,300	1,100	400	*	*	100	100	800	200	2,200	*	700	11
Whitby	12	4,700	100	100	2,800	200	3,400	*	100	200	2,200	2,400	6,400	4,400	800	*	100	*	200	700	200	2,400	*	300	12
Oshawa	13	2,900	*	*	2,000	100	2,700	*	100	400	2,300	2,300	5,000	10,500	1,800	*	*	*	*	300	200	1,700	*	400	13
Clarington	14	1,600	*	*	900	100	1,100	*	*	200	1,400	1,400	2,900	5,500	5,300	*	*	*	100	100	*	600	*	100	14
YORK																									
Georgina	15	400	*	100	600	*	300	*	200	*	100	*	100	*	*	2,800	700	2,200	1,100	800	400	1,200	100	500	15
East Gwillimbury	16	300	*	*	300	*	100	*	100	*	*	*	100	*	*	100	700	1,400	500	200	200	800	100	400	16
Newmarket	17	2,300	*	100	2,300	200	700	*	200	*	100	*	*	100	*	400	600	5,000	2,200	1,700	400	2,400	300	1,800	17
Aurora	18	1,800	*	100	1,500	200	400	*	*	*	100	*	*	100	*	*	100	2,000	2,200	1,400	400	2,000	300	1,600	18
Richmond Hill	19	9,500	300	200	8,400	1,400	3,400	*	100	*	200	100	100	100	*	100	100	900	1,400	7,400	300	7,500	200	6,500	19
Whitchurch-Stouffville	20	1,600	*	*	1,100	200	1,800	*	100	*	*	100	100	100	*	*	*	500	300	900	1,400	2,700	100	400	20
Markham	21	16,200	400	100	12,600	1,400	11,100	*	400	*	600	100	200	300	*	100	*	700	700	5,100	500	19,000	100	4,200	21
King	22	600	*	100	800	400	100	*	*	*	*	*	*	*	*	*	*	400	300	400	100	400	700	1,100	22
Vaughan	23	14,900	300	600	16,400	4,500	2,100	*	*	*	*	*	200	200	100	*	*	800	800	3,000	100	4,800	400	22,700	23
PEEL																									
Caledon	24	1,100	100	100	1,100	1,800	100	*	*	*	*	*	*	*	*	*	100	200	100	100	*	400	300	2,100	24
Brampton	25	11,100	*	700	7,700	10,500	1,000	*	100	*	*	*	100	200	*	*	*	300	200	800	*	1,900	100	9,500	25
Mississauga	26	28,900	300	1,000	9,900	14,500	1,800	*	*	*	*	100	*	100	*	*	*	100	100	800	100	1,700	100	4,500	26
HALTON																									
Halton Hills	27	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	27
Milton	28	2,100	*	*	900	1,400	200	*	*	*	*	*	*	*	*	*	*	*	*	100	*	300	*	800	28
Oakville	29	10,100	*	200	1,400	1,600	200	*	*	*	*	*	*	*	*	*	*	*	*	100	*	300	*	700	29
Burlington	30	3,700	100	*	600	900	200	*	*	*	*	*	*	*	*	*	*	*	*	100	*	200	*	300	30
CITY OF HAMILTON																									
Flamborough	31	700	*	*	100	*	100	*	*	*	*	*	*	*	*	*	*	*	*	100	*	*	*	200	31
Dundas	32	200	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	100	32
Ancaster	33	300	*	*	*	100	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	100	33
Glanbrook	34	100	*	*	*	100	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	34
Stoney	35	200	*	*	100	200	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	35
Hamilton	36	1,800	*	*	700	400	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	100	*	200	36
MUNICIPAL TOTAL		468,200	12,800	13,100	195,500	83,200	103,200	800	3,500	2,400	16,000	13,100	19,400	26,500	9,300	3,800	2,900	16,600	12,500	35,300	5,600	85,100	3,000	89,300	
REGION TOTAL							876,000								91,000									254,100	

NOTE: All numbers have been rounded to the nearest one hundred. As a result, there may be some discrepancy in the column and row totals.

2016 HOME-TO-WORK MATRIX FOR 36 MUNICIPALITIES - A.M PEAK (continued)

SURVEY: 2016
PURPOSE: WORK
MODE: ALL
PERIOD: 6:00 - 8:59 A.M.

	TO: PEEL			HALTON				HAMILTON						MUNICIPAL	REGION		
	Caledon	Brampton	Mississauga	Halton Hills	Milton	Oakville	Burlington	Flamborough	Dundas	Ancaster	Glanbrook	Stoney	Hamilton	TOTAL	TOTAL		
	24	25	26	27	28	29	30	31	32	33	34	35	36				
															716,600		**TORONTO**
1	200	2,300	10,900	*	100	1,800	200	*	*	*	*	*	300	247,800		1	Toronto
2	*	200	600	*	*	100	*	*	*	*	*	*	*	28,500		2	East York
3	100	600	3,100	*	100	300	100	*	*	*	*	*	*	37,500		3	York
4	400	2,200	8,500	100	200	500	300	*	*	*	*	*	100	168,600		4	North York
5	400	3,900	15,600	200	200	1,600	400	*	*	*	*	*	300	94,600		5	Etobicoke
6	*	1,000	4,200	*	*	200	200	*	*	*	*	*	*	139,600		6	Scarborough
															155,600		**DURHAM**
7	*	*	100	*	*	*	*	*	*	*	*	*	*	2,200		7	Brock
8	*	*	100	*	*	*	*	*	*	*	*	*	*	5,500		8	Uxbridge
9	*	*	100	*	*	*	*	*	*	*	*	*	*	4,600		9	Scugog
10	*	200	600	*	*	*	*	*	*	*	*	*	*	25,000		10	Pickering
11	*	200	600	*	*	*	*	*	*	*	*	*	*	30,800		11	Ajax
12	*	200	600	*	*	100	*	*	*	*	*	*	100	32,400		12	Whitby
13	100	100	400	*	100	*	100	*	*	*	*	*	*	33,400		13	Oshawa
14	*	100	200	*	*	*	*	*	*	*	*	*	*	21,700		14	Clarington
															285,900		**YORK**
15	*	*	200	*	*	100	*	*	*	*	*	*	*	11,700		15	Georgina
16	*	*	200	*	*	*	*	*	*	*	*	*	*	5,700		16	East Gwillimbury
17	100	200	600	*	*	100	*	*	*	*	*	*	*	21,800		17	Newmarket
18	*	100	600	*	*	*	*	*	*	*	*	*	*	14,900		18	Aurora
19	100	1,200	2,300	100	*	200	100	*	*	*	*	*	*	52,100		19	Richmond Hill
20	*	100	300	*	*	*	*	*	*	*	*	*	*	11,900		20	Whitchurch-Stouffville
21	200	700	2,200	*	*	300	100	*	*	*	*	*	200	77,600		21	Markham
22	200	300	400	*	*	*	*	*	*	*	*	*	100	6,200		22	King
23	600	3,500	6,900	*	100	500	100	*	*	*	*	*	100	84,000		23	Vaughan
															334,300		**PEEL**
24	3,100	3,900	3,000	200	*	200	*	*	*	*	*	*	*	18,200		24	Caledon
25	3,000	42,700	42,000	1,100	800	2,000	1,100	*	*	*	*	*	400	137,600		25	Brampton
26	600	12,200	86,500	800	1,700	8,600	2,200	*	100	100	*	100	1,300	178,500		26	Mississauga
															124,000		**HALTON**
27	*	*	*	*	*	*	*	*	*	*	*	*	*	*		27	Halton Hills
28	200	2,900	9,400	400	5,200	2,600	1,400	100	*	*	100	100	400	28,500		28	Milton
29	*	1,300	13,400	200	800	12,500	3,000	300	*	100	*	100	1,300	47,800		29	Oakville
30	*	700	6,600	100	1,500	9,100	16,600	600	100	500	200	600	4,800	47,700		30	Burlington
															118,600		**CITY OF HAMILTON**
31	*	400	1,200	*	300	700	2,200	2,400	*	200	*	100	2,100	10,900		31	Flamborough
32	*	*	*	*	*	200	500	200	500	200	*	200	2,900	5,100		32	Dundas
33	*	100	500	*	*	600	900	100	300	1,000	100	400	4,600	8,900		33	Ancaster
34	100	*	300	*	100	300	800	200	100	300	600	900	3,100	7,000		34	Glanbrook
35	*	*	700	*	100	1,200	2,800	200	*	400	400	3,100	6,400	16,000		35	Stoney
36	*	400	3,100	100	600	3,200	8,600	1,100	1,000	2,900	1,600	4,500	40,200	70,700		36	Hamilton
	10,300	84,400	230,500	7,500	13,100	47,600	42,400	5,300	2,200	5,600	3,200	10,200	68,700				**MUNICIPAL TOTAL**
			325,200				110,600						95,200		1,752,000		**REGION TOTAL**

NOTE: All numbers have been rounded to the nearest one hundred. As a result, there may be some discrepancy in the column and row totals.

Trip Distribution/Assignment Calculations and Assumptions for Subject Subdivision (Residential)

Trips from Caledon to:		Assumptions
Toronto	4,300	60% to the south via Kennedy Road
		40% to the west via Old School Road
Vaughan	2,100	60% to the south via Kennedy Road
		40% to the west via Old School Road
Rest of York Region	1,200	30% to the north via Kennedy Road
		20% to the east via Old School Road
		30% to the south via Kennedy Road
		20% to the west via Old School Road
Caledon	3,100	10% to the north via Kennedy Road
		40% to the east via Old School Road
		30% to the south via Kennedy Road
		20% to the west via Old School Road
Brampton	3,900	60% to the south via Kennedy Road
		40% to the west via Old School Road
Mississauga	3,000	60% to the south via Kennedy Road
		40% to the west via Old School Road
Halton Hills	200	60% to the south via Kennedy Road
		40% to the west via Old School Road
Oakville	200	60% to the south via Kennedy Road
		40% to the west via Old School Road
Total	**18,000**	

Note: Trip totals were taken from the 2016 TTS A.M. Peak Period and Work Trip Distribution Table.

Calculated Trip Distribution:

670 trips to the north via Kennedy Road (4%)

1,480 trips to the east via Old School Road (8%)

9,510 trips to the south via Kennedy Road (53%)

6,340 trips to the west via Old School Road (35%)

APPENDIX I

PICTURES FROM SITE VISIT DATED MAY 13TH, 2024

STREET ‘B’ AT OLD SCHOOL ROAD – FACING EAST

STREET ‘B’ AT OLD SCHOOL ROAD – FACING WEST

STREET ‘A’/PROPOSED COLLECTOR ROAD AT KENNEDY ROAD – FACING NORTH

STREET ‘A’/PROPOSED COLLECTOR ROAD AT KENNEDY ROAD – FACING SOUTH

STREET ‘C’/PROPOSED LOCAL ROAD AT KENNEDY ROAD – FACING NORTH

STREET ‘C’/PROPOSED LOCAL ROAD AT KENNEDY ROAD – FACING SOUTH

APPENDIX J

RELEVANT EXCERPT FROM THE TOWN OF CALEDON'S ACTIVE TRANSPORTATION MASTER PLAN

Map 5. Network recommendations