

26 October 2020
Project: 200473

Kim Pilon
Moorefield Excavating
6297 Wellington Road 109S
Harrison ON N0G 1Z0

Dear Ms. Pilon:

**RE: ELORA STREET DEVELOPMENT
TRANSPORTATION IMPACT STUDY ADDENDUM**

Background

In July 2019, Paradigm Transportation Solutions Limited (Paradigm) submitted a Transportation Impact Study (TIS) for a proposed residential development located in the community of Harriston, Ontario, Town of Minto, County of Wellington. The subject site is located on the west side of Elora Street at the southern terminus of John Street. The site's total trip generation was estimated to be approximately 90 and 120 external trips during the AM and PM peak, respectively.

The TIS assessed the transportation impact of 129 residential units (77 single family dwellings, 22 semi-detached dwellings, and 30 townhouses).

The study concluded that the surrounding road network would operate acceptably with full development and occupancy of the proposed uses. Furthermore, no remedial measures were required to mitigate any forecast traffic impacts, although it was recommended that the County of Wellington consider implementing a northbound left-turn lane on Elora Street South at Anne Street to occupy the space created by the shadow lane opposite of the existing southbound left-turn lane at this intersection. This northbound left-turn lane was not a warranted requirement, but a suggestion as the road width to accommodate this left turn lane exists.

Site Access

The proposed site plan that was analysed in the TIS included two accesses to the development:

- ▶ The first access would be an extension of John Street. Anne Street would also extend to intersect with John Street.

- ▶ The second access was proposed on Elora Street south of the Jessie Street intersection and is referred to as Street D.

Since the submission of the July 2019 TIS, it was requested by the Town of Minto to analyse the impact of not having access to the subject development via Street D.

Future Traffic Conditions

Traffic Volumes

Site-generated traffic forecasts which used Street D to access Elora Street in the TIS were all reassigned to use Anne Street. The updated traffic volumes for the Total 2034 horizon at the intersection of Elora Street and Anne Street are shown in **Figure 1**.

Traffic Operations

Traffic conditions were analyzed at the intersection of Elora Street and Anne Street assuming Street D is not open to traffic. The traffic volumes assigned to Street D in the TIS were shifted north to Street A. The July 2019 TIS forecasts that Street A and Street D would both operate at acceptable Levels of Service (LOS). The updated analysis forecasts that the removal of Street D will not impact traffic operations and the study area intersections will operate within acceptable levels (LOS A).

Appendix A contains the detailed Synchro 10 reports.

Left-turn Lane Warrants

Using the updated traffic volumes, left-turn lane warrant analyses for the left-turn volumes on Elora Street at Anne Street were reassessed. The results indicate that left-turn lanes are:

- ▶ not warranted for the southbound left-turn movement on Elora Street at Anne Street
- ▶ warranted on the northbound left-turn movement on Elora Street and Anne Street during the PM Peak Hour with 15 metres of storage length.

As noted in the TIS, a shadow lane in the centre of Elora Street exists on the south leg of the intersection of Elora Street and Anne Street, which can be repainted to accommodate a left-turn lane. The difference between the analysis contained in the TIS and this updated analysis is that a northbound left-turn lane is now forecast to be warranted by total future traffic volumes.

The warrant nomographs used in the analysis for the northbound and southbound approaches are included in **Figure 2** and **Figure 3**, respectively.



Emergency Access

Safe access for emergency vehicles to provide services to all units is required by the County of Wellington Official Plan. If Street D is removed from the site plan, the access to the subdivision is reduced to one point causing a chokepoint, as shown in the red circle in **Figure 4**. If that chokepoint were to become inaccessible to vehicles, emergency crews would need to travel approximately 300 m to the furthest unit from Elora Street South.

If Street D is not built for access for residential purposes, an emergency vehicle access at that location is recommended as a redundancy.

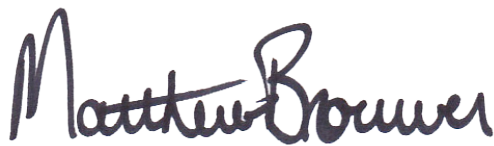
Conclusion and Recommendations

Based on the analysis, not having Street D as a regular vehicular access to the subject development will have the following impacts on the conclusions of the previous TIS:

- ▶ The intersection of Elora Street South and Anne Street is still forecast to operate acceptably.
- ▶ A northbound left-turn lane on Elora Street at Anne Street with a storage length of 15 metres is warranted. This left-turn lane was not warranted in the TIS, but was recommended as the south leg of this intersection currently has a centre shadow lane opposite of the existing southbound left-turn lane.
- ▶ Street D should be used as an alternate access for emergency vehicles.

Yours very truly,

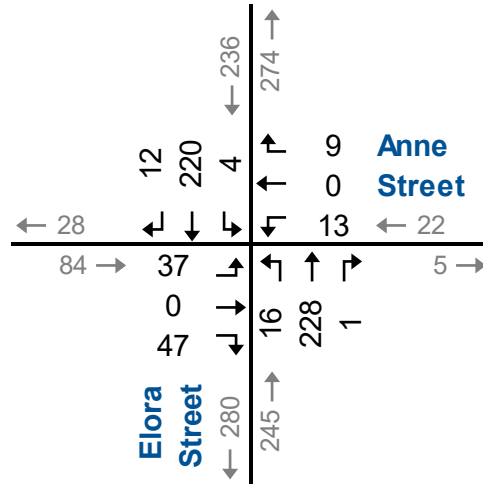
PARADIGM TRANSPORTATION SOLUTIONS LIMITED



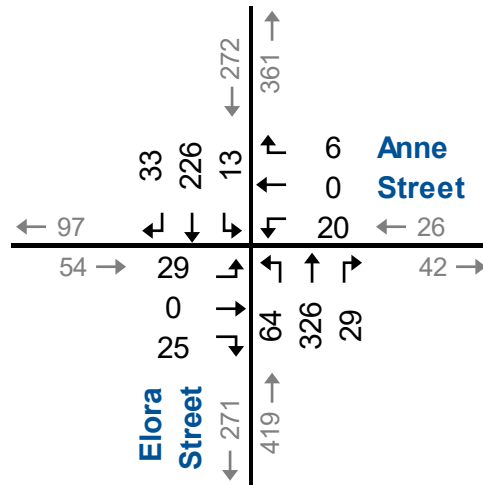
Matt Brouwer
P.Eng.
Senior Project Manager

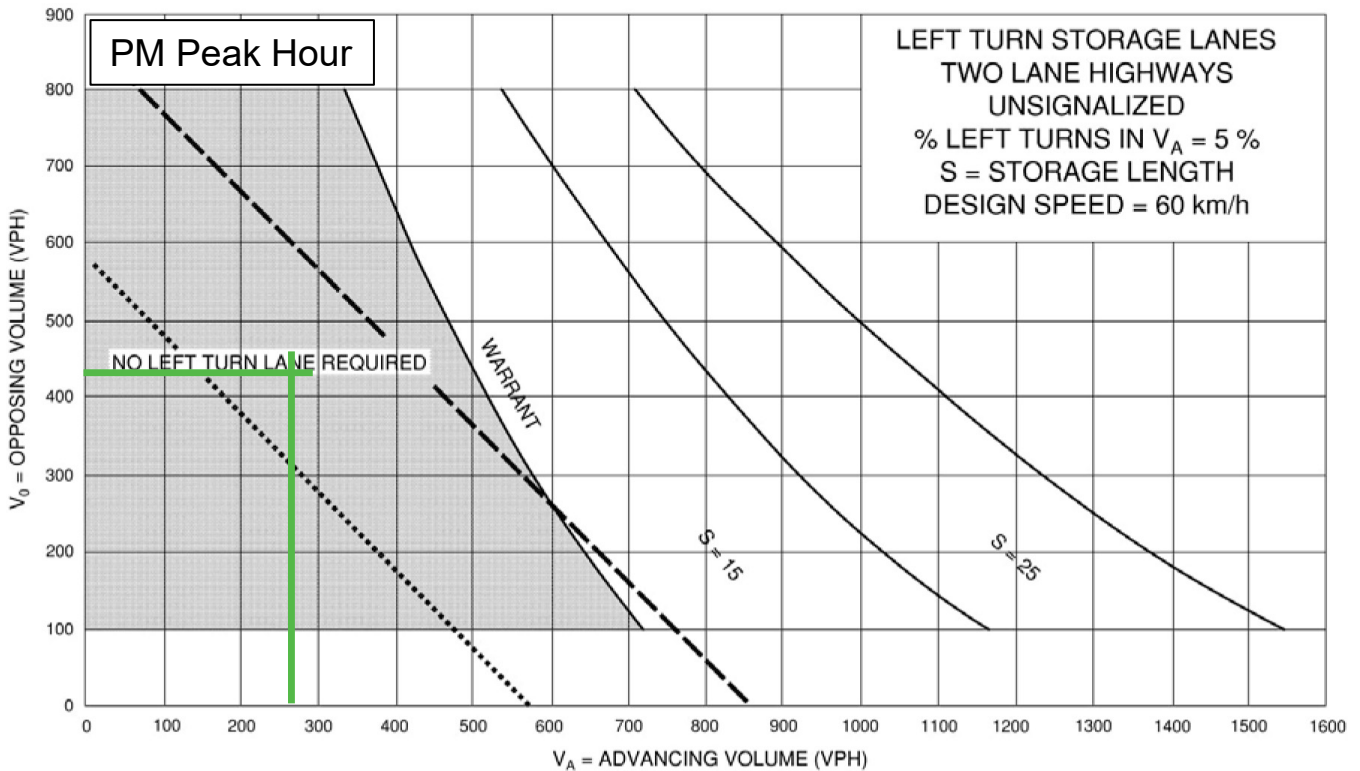
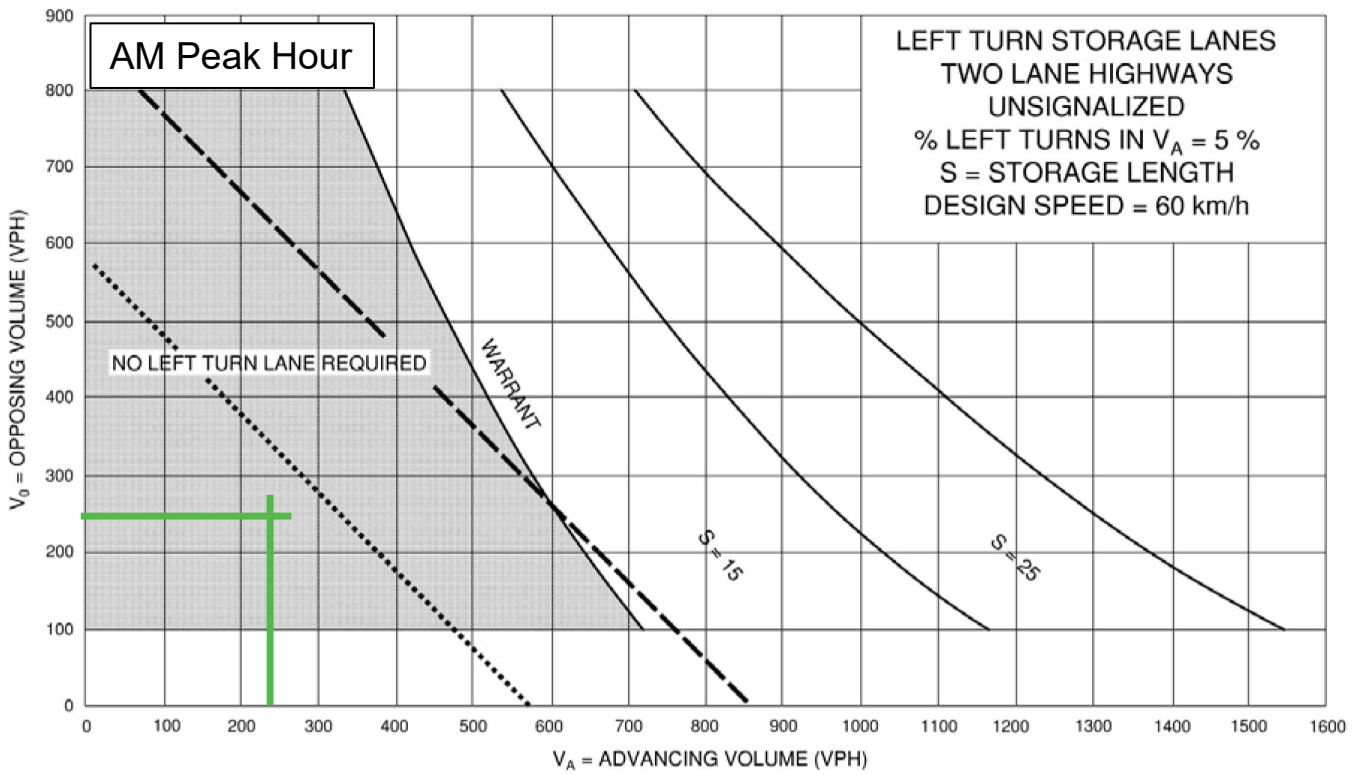


AM Peak Hour

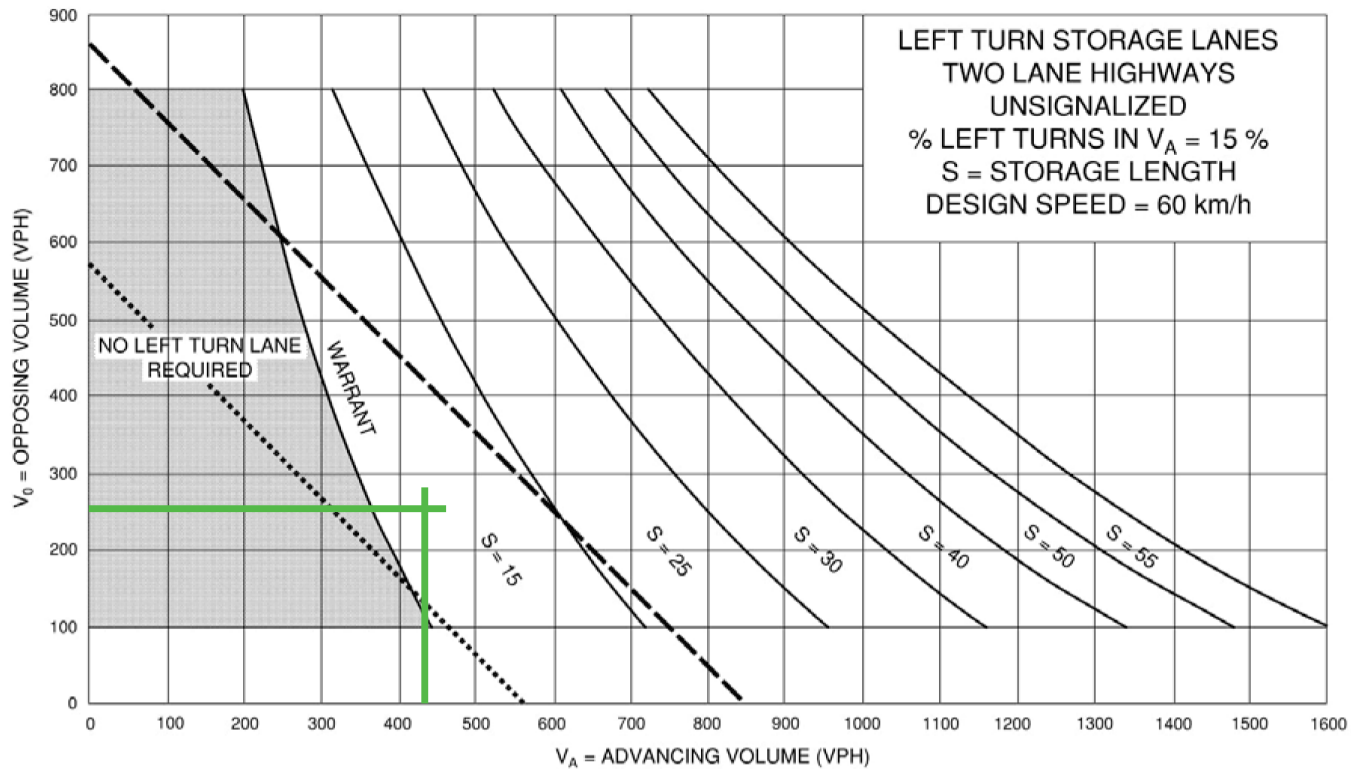
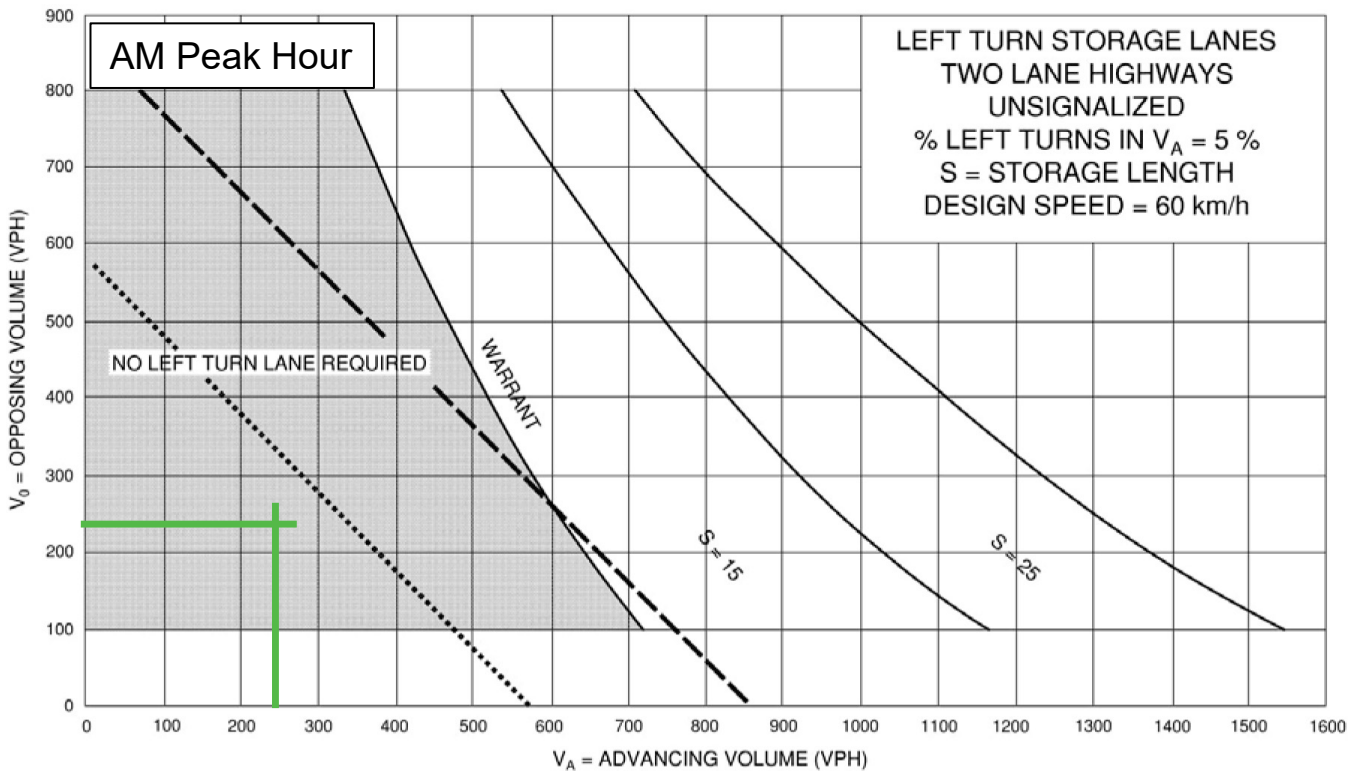


PM Peak Hour





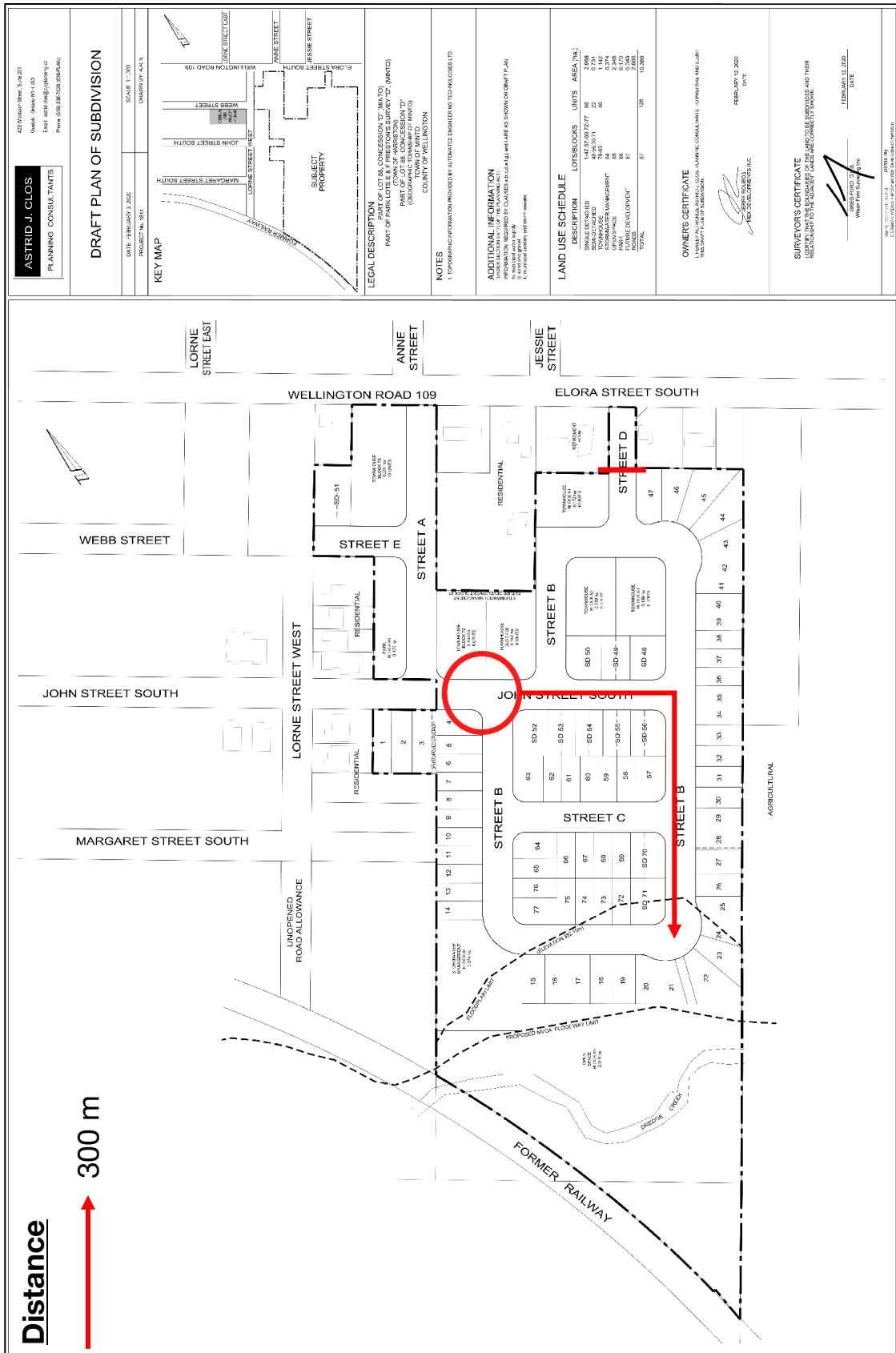
Left-Turn Lane Warrant Southbound Elora Street at Anne Street 2034 Total Horizon



Left-Turn Lane Warrant Northbound Elora Street at Anne Street 2034 Total Horizon

Distance

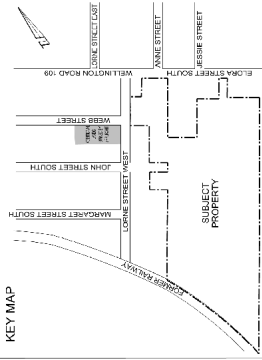
300 m



ASTRID J. GLOS
PLANNING CONSULTANTS

DRAFT PLAN OF SUBDIVISION

DATE: FEBRUARY 3, 2020
PROJECT NO. 1011



LEGAL DESCRIPTION
PART OF LOT 86, CONCESSION "D" (MINTO)
PART OF LOT 87, CONCESSION "D" (MINTO)
TOWN OF MINTO
COUNTY OF WELLINGTON

NOTES
1. TOPOGRAPHIC INFORMATION PROVIDED BY AUTOMATED ENGINEERING TECHNOLOGIES LTD.

ADDITIONAL INFORMATION
INFORMATION REQUIRED BY CHAPTER 23.6.4.1 (M) AND 23.6.4.2 (M) AS SHOWN ON DRAFT PLAN.

LAND USE SCHEDULE

REGULATED USE	LOTS/BLOCKS	UNITS	AREA (S.A.)
RESIDENTIAL	1-42	22	2,460
INDUSTRIAL	43-46	22	2,778
COMMERCIAL	47-51	41	5,378
STORMWATER MANAGEMENT	52	1	1,170
PARK	53-54	2	2,600
AGRICULTURE	55-57	3	3,800
TOTAL	87	128	15,386

OWNER'S CERTIFICATE
I, HERBERT LAMAR ARNOLD, OWNER, HEREBY CERTIFY THAT THE INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

HERBERT LAMAR ARNOLD
FEBRUARY 12, 2020
DATE

SURVYOR'S CERTIFICATE
I, HERBERT LAMAR ARNOLD, SURVYOR, HEREBY CERTIFY THAT THE INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

HERBERT LAMAR ARNOLD
FEBRUARY 12, 2020
DATE



Elora Street, Harriston TIS Addendum
200473

Proposed Site Plan
Figure 4



















Appendix A

Synchro 2034 Total Traffic Operations Report





















HCM Unsignalized Intersection Capacity Analysis
 1: Elora Street & Anne Street

2034 Total AM Peak Hour
 10-13-2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	0	47	13	0	9	16	228	1	4	220	12
Future Volume (Veh/h)	37	0	47	13	0	9	16	228	1	4	220	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	0	51	14	0	10	17	248	1	4	239	13
Pedestrians					2							
Lane Width (m)					3.6							
Walking Speed (m/s)					1.2							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	546	538	246	582	544	250	252			251		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	546	538	246	582	544	250	252			251		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.4		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.5		
p0 queue free %	91	100	94	96	100	99	99			100		
cM capacity (veh/h)	437	441	793	393	438	792	1313			1152		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	91	24	266	4	252							
Volume Left	40	14	17	4	0							
Volume Right	51	10	1	0	13							
cSH	584	498	1313	1152	1700							
Volume to Capacity	0.16	0.05	0.01	0.00	0.15							
Queue Length 95th (m)	4.4	1.2	0.3	0.1	0.0							
Control Delay (s)	12.3	12.6	0.6	8.1	0.0							
Lane LOS	B	B	A	A								
Approach Delay (s)	12.3	12.6	0.6	0.1								
Approach LOS	B	B										
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Utilization			37.3%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 1: Elora Street & Anne Street

2034 Total PM Peak Hour
 Elora Street, Harriston TIS

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	0	25	20	0	6	64	326	29	13	226	33
Future Volume (Veh/h)	29	0	25	20	0	6	64	326	29	13	226	33
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	0	27	22	0	7	70	354	32	14	246	36
Pedestrians					4							
Lane Width (m)					3.6							
Walking Speed (m/s)					1.2							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	809	822	264	815	824	374	282			390		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	809	822	264	815	824	374	282			390		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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 %	89	100	97	92	100	99	95			99		
cM capacity (veh/h)	280	288	775	272	287	674	1280			1176		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	59	29	456	14	282							
Volume Left	32	22	70	14	0							
Volume Right	27	7	32	0	36							
cSH	396	318	1280	1176	1700							
Volume to Capacity	0.15	0.09	0.05	0.01	0.17							
Queue Length 95th (m)	4.2	2.4	1.4	0.3	0.0							
Control Delay (s)	15.7	17.5	1.7	8.1	0.0							
Lane LOS	C	C	A	A								
Approach Delay (s)	15.7	17.5	1.7	0.4								
Approach LOS	C	C										
Intersection Summary												
Average Delay			2.8									
Intersection Capacity Utilization			49.7%		ICU Level of Service					A		
Analysis Period (min)			15									