

21 June 2018  
Project: 180151

Mr. John Perks  
Mr. Avram Stelica  
c/o Scott J. Patterson  
Senior Planner, Principal  
Labreche Patterson & Associates Inc.  
300-F Trillium Drive  
Kitchener ON N2E 3J2

Dear Mr. Patterson:

**RE: ACCESS REVIEW STUDY  
319, 337 & 343 WOOLWICH STREET, WATERLOO ON**

---

Paradigm Transportation Solutions Limited (Paradigm) has prepared this Access Review Study for a proposed residential development at 319, 337 & 343 Woolwich Street in the City of Waterloo. The subject development is located on the west and south sides of Woolwich Street adjacent to its roundabout intersection with Kiwanis Park Drive and Falconridge Drive.

The development includes 22 townhouses and 10 single-family units. Six of the singles are proposed to have driveways on the west leg of Woolwich Street, while four of them will have driveways on the south leg. The townhouses are proposed to be developed in three blocks with a single internal roadway connection to the west leg of Woolwich Street.

**Figure 1** and **Figure 2** respectively illustrate the location of the development and the proposed Site Plan.

As part of its pre-consultation comments, the City of Waterloo has asked for a scoped **Traffic Impact Study** to fulfill the following requirements:

- ▶ The study is not required to assess traffic volumes, rather it is required to assess whether the location of the driveways for the proposed single detached lots and the proposed driveway for the townhouse parcel would conflict with the proposed roundabout at the intersection of Woolwich Street and Kiwanis Park Drive.
- ▶ The study should also assess whether the number of driveways created by the proposed development would impact the flow of traffic along Woolwich Street.

It is noted that the roundabout at Woolwich Street and Kiwanis Park Drive has since been constructed, and this Letter-Memo addresses the two requirements of the City by reviewing the access locations of the proposed development relative to the roundabout in terms of design criteria for spacing of driveways, sight distance requirements and the current and projected traffic volumes on Woolwich street.

Our review and conclusions are based on the proposed site plan and design drawings for the existing roundabout; field investigation and measurements; and current and future traffic volumes included in the 2015 Woolwich Street Environmental Assessment Memorandum prepared by IBI Group.

## Access and Driveway Spacing

Woolwich Street, Falconridge Drive and Kiwanis Park Drive are residential area roadways providing access to properties (land service) and carrying local traffic (traffic service). The existing roundabout is designed to function consistent with the lower traffic volumes, lower speeds and access-providing roadways. There are already existing driveways and access-road intersections proximate to the new roundabout, similar to the single driveways and townhouse complex access road as proposed for the subject development. We undertook a comparison of the existing and proposed driveway and intersection spacings at the Woolwich Street roundabout.

The distances from the existing first driveway to the south and the Redtail Street intersection to the east were measured from the end of curb radius to the turning curb radius of the roundabout. They are compared to corresponding distances in the proposed site plan, as shown in **Table 1**.

**TABLE 1: NEAREST ACCESS DISTANCES FROM ROUNDABOUT**

Access Type	Existing	Proposed
Intersection	41 m (Redtail Street)	95 m (access road to townhouses)
First Driveway to the South	15 m	19 m (from nearest Lot Line)

As can be seen, the distances from the roundabout to the nearest driveway to the south and the townhouse access intersection in the proposed development are greater than the existing comparable distances. The nearest single unit lot line on the westerly leg is more than 50 metres from the roundabout, and there is also an existing residential driveway in between. These distances are also greater than comparable distances at the roundabout connecting Laurelwood Drive and Beaver Creek Road in the westerly part of the City.

The geometric Design Guide for Canadian Roads by the Transportation Association of Canada (TAC) does not specify access spacing from roundabouts. However, the corner clearances at minor intersections indicate a minimum driveway distance of 11.0 metres for residential land uses. The existing and proposed distances at the Woolwich Street roundabout are greater than



the TAC minimum and are consistent with the location and function of a residential area roundabout.

## Sight Distance

In addition to intersection/driveway spacing, the sight distance requirements for the proposed driveway and townhouse access intersections were assessed in the field, in accordance with Section 2.5 of the TAC Design Guide<sup>1</sup>, which indicates a stopping distance of 85 m for a 60 km/h design speed. The sight distance was measured at the following three locations:

- ▶ Location 1: The proposed townhouse entrance, given the horizontal curve between the entrance and the roundabout to the east;
- ▶ Location 2: Approximately four metres west of the easterly lot line for Lot 6; and
- ▶ Location 3: Approximately 60 m south of the existing roundabout near the southeastern most corner of the site, due to the presence of a vertical curve to the south of the site.

The sight distances measured in the field are shown in **Table 2**.

**TABLE 2: MEASURED SIGHT DISTANCES**

Location		Sight Distances	
		Measured	Required
#1	Proposed townhouse entrance	To/From West: > 200 m To/From East: 80 m	85 m
#2	4 m from east lot line on east-west leg of Woolwich Street	To/From West: > 200 m To/From East: Visibility extends to roundabout	
#3	Near southeastern most corner of site	To/From North: Visibility extends to roundabout To/From South: 105 m	

As shown, the sight distance requirements are satisfied for the critical access locations of the proposed development, with the exception of the sight distance requirement to the east at the proposed townhouse access. At this location, the sight visibility is hindered by the tree line between Lot 6 and the existing dwelling adjacent to the roundabout. However, we do not

<sup>1</sup> Geometric Design Guide for Canadian Roads. Transportation Association of Canada. June 2017.



consider the existing tree line to be a concern because operating speeds at the roundabout will be lower than the 60 km/h design speed<sup>2</sup>.

## Woolwich Street Traffic Flow

The base year (2014) and projected future traffic volumes in the IBI Memorandum indicate that the peak directional travel on Woolwich Street is northbound/westbound during the morning peak hour, and eastbound/southbound during the afternoon peak hour. The higher of the projected future AM and PM peak hour traffic volumes on Woolwich Street are as follows:

- ▶ AM Peak Hour, Northbound: 145 vph
- ▶ AM Peak Hour, Westbound: 218 vph
- ▶ PM Peak Hour, Eastbound: 267 vph
- ▶ PM Peak Hour, Southbound: 184 vph

The proposed development includes 22 townhouses with a single access along with six single unit driveways on the westerly leg of Woolwich Street, and four single unit driveways on the southerly leg of Woolwich Street. The projected traffic volumes and the proposed access locations are consistent with peak traffic flows and access locations in a residential area. The low traffic volumes, the low development trip generation, and the lower speeds proximate to the roundabout are conducive to providing gaps for access turning movements without impeding roadway traffic flow.

---

<sup>2</sup> Table 9.21.1 of the TAC Design Guide has a desirable maximum entry design speed of a mini-roundabout of 25-30 km/h. Thus, a vehicle exiting the roundabout is unlikely to reach the design speed of 60 km/h before becoming visible to a vehicle leaving the proposed townhouse access.



## Summary and Conclusions

The foregoing access review was undertaken in support of the proposed redevelopment of properties known as 319, 337 and 343 Woolwich Street in the City of Waterloo, to address the City's requirement to assess (a) potential conflicts between the proposed access locations and the new roundabout at Woolwich Street and Kiwanis Park Drive; and (b) potential impact on traffic flow on Woolwich Street. The access assessment was based on reviewing (i) existing and proposed driveway/intersection spacing; (ii) sight distance requirements; and (iii) roadway traffic volumes. The results of the review indicate that the location and the function of the proposed access points for the subject development are consistent with the design and function of the new roundabout, as well as the current and future traffic flows on Woolwich Street.

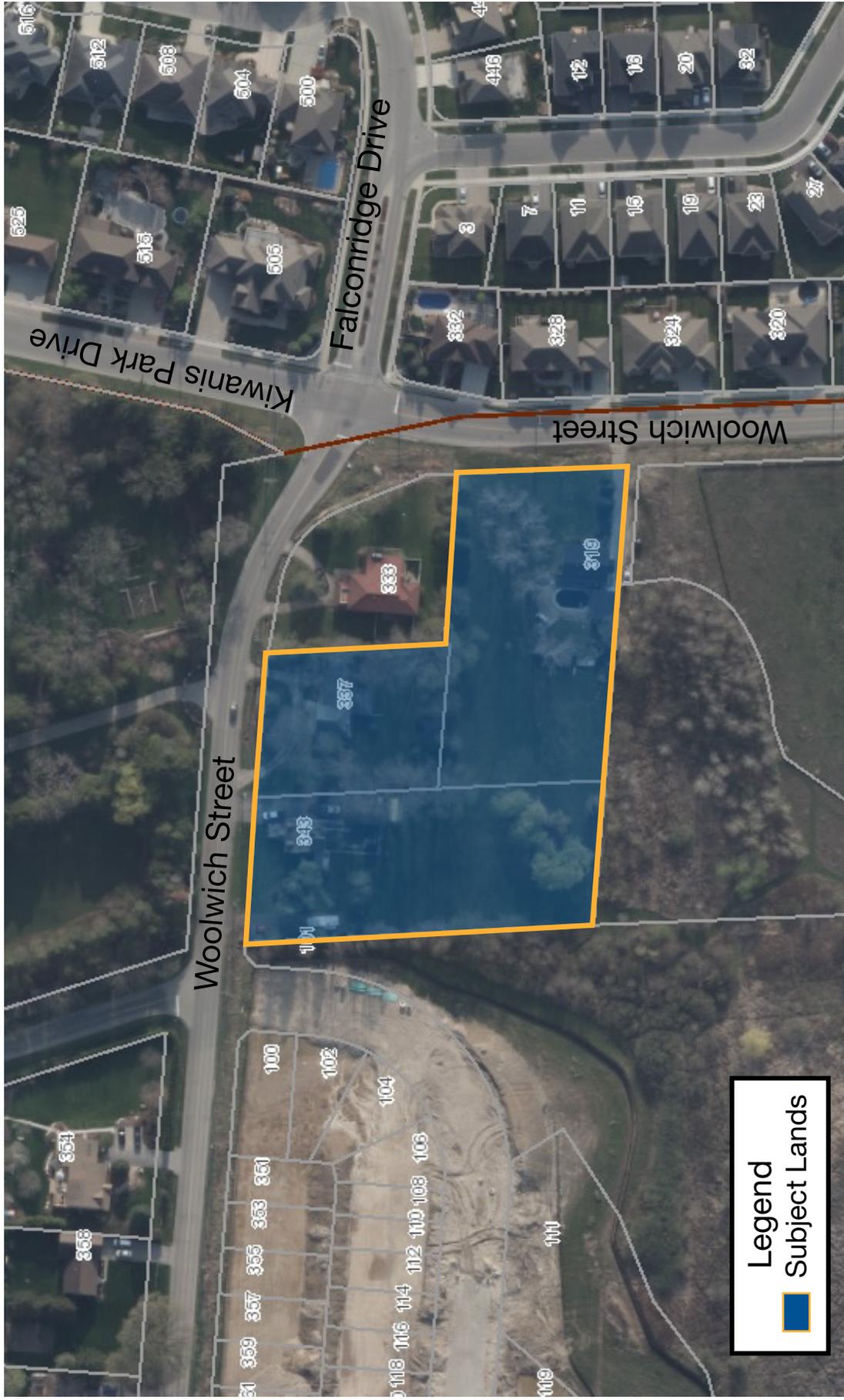
Yours very truly,

**PARADIGM TRANSPORTATION SOLUTIONS LIMITED**

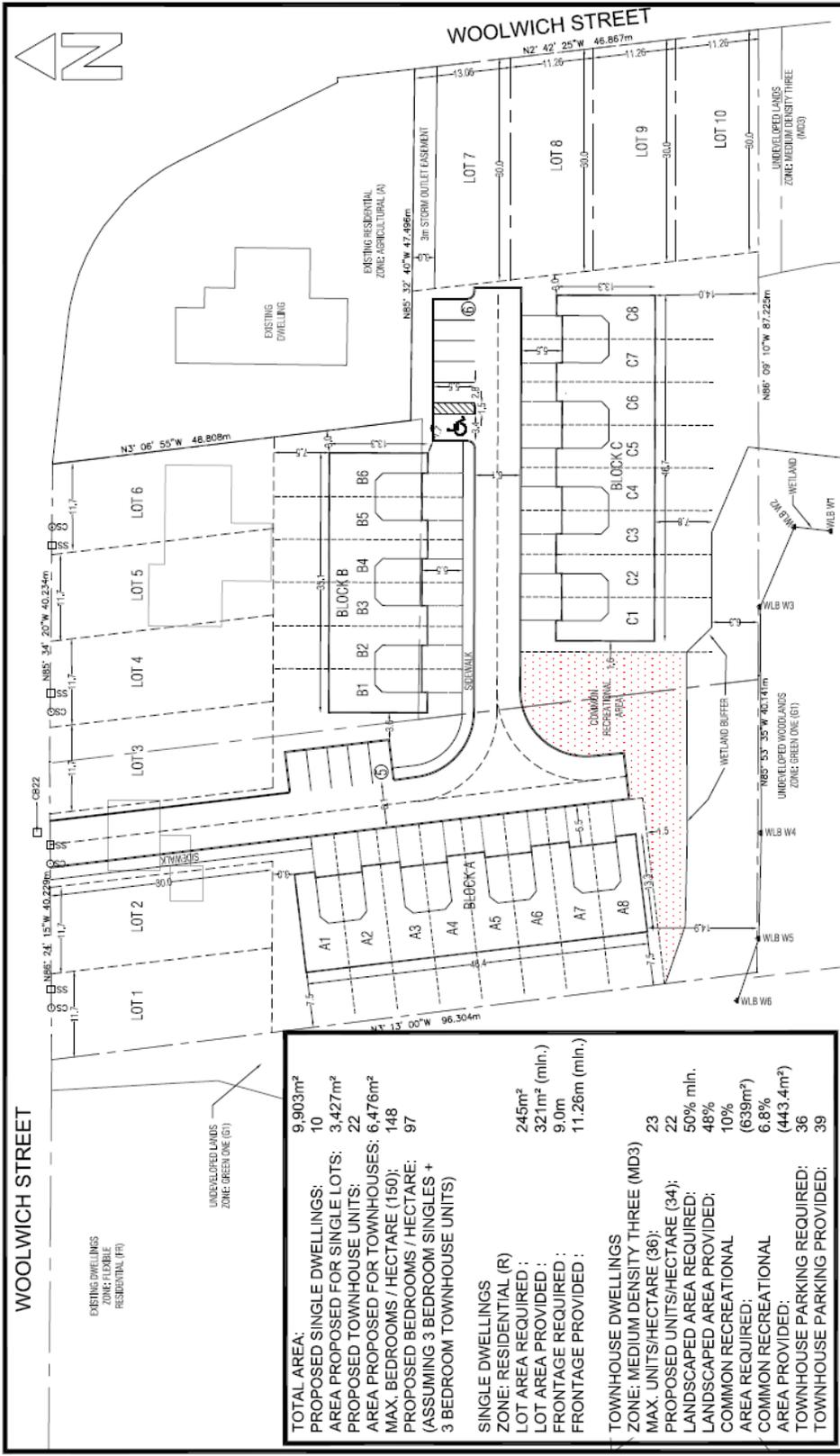


**Jim Mallett**  
M.A.Sc., P.Eng., PTOE  
President





## Study Area



**CONCEPT PLAN**  
**319, 337 & 343 WOOLWICH STREET**  
**CITY OF WATERLOO**

SCALE: 1:300 (PAPER SIZE: 11x17) PROJECT NO. P-074

**Labreche Patterson & Associates Inc.**  
 Professional Planners, Development Consultants, Project Managers  
 3304 Trillium Drive  
 Mississauga, Ontario  
 P: (905) 884-6555  
 F: (905) 884-6555

<b>TOTAL AREA:</b>	9,903m <sup>2</sup>
PROPOSED SINGLE DWELLINGS:	10
AREA PROPOSED FOR SINGLE LOTS:	3,427m <sup>2</sup>
PROPOSED TOWNHOUSE UNITS:	22
AREA PROPOSED FOR TOWNHOUSES:	6,476m <sup>2</sup>
MAX. BEDROOMS / HECTARE (150):	148
PROPOSED BEDROOMS / HECTARE:	97
(ASSUMING 3 BEDROOM SINGLES + 3 BEDROOM TOWNHOUSE UNITS)	
<b>SINGLE DWELLINGS</b>	
ZONE: RESIDENTIAL (R)	245m <sup>2</sup>
LOT AREA REQUIRED :	321m <sup>2</sup> (min.)
LOT AREA PROVIDED :	9.0m
FRONTAGE PROVIDED :	11.26m (min.)
<b>TOWNHOUSE DWELLINGS</b>	
ZONE: MEDIUM DENSITY THREE (MD3)	23
MAX. UNITS/HECTARE (36):	22
PROPOSED UNITS/HECTARE (34):	50% min.
LANDSCAPED AREA REQUIRED:	48%
LANDSCAPED AREA PROVIDED:	10%
COMMON RECREATIONAL	(639m <sup>2</sup> )
AREA REQUIRED:	6.8%
COMMON RECREATIONAL	(443.4m <sup>2</sup> )
AREA PROVIDED:	36
TOWNHOUSE PARKING REQUIRED:	39
TOWNHOUSE PARKING PROVIDED:	