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Project: (230167)

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Asset Management
1000237993 Ontario Inc.
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RE: PROPOSED ADAPTIVE RE-USE MIXED-USE DEVELOPMENT, 180 KING STREET SOUTH, WATERLOO, TRIP GENERATION LETTER

Introduction

AXIA GeoCapital Inc. on behalf of 1000237993 Ontario Inc. retained Paradigm Transportation Solutions Limited (Paradigm) to prepare a Trip Generation Letter for a proposed adaptive re-use, mixed-use development at 180 King Street South in the City of Waterloo. **Figure 1** (attached) illustrates the location of the site.

The purpose of this Trip Generation Letter is two-fold:

- ▶ estimate the net change in trip generation between the existing land use(s) and the proposed land use(s); and
- ▶ qualify the net impact of the change in trip generation.

Site and Development Description

The site is on the northeast corner of King Street South and Allen Street East. It is currently occupied by a seven-storey office building with a gross floor area (GFA) of 10,700 m² (115,170 sq. ft.). Vehicle access is provided by two all-moves driveways to Allen Street East, approximately 35 metres and 45 metres east of King Street South, respectively.¹

The property owner plans to redevelop the site into a 10-storey mixed-use development, comprising 129 residential units, and 1,562 m² (16,820 sq. ft.) GFA of ground floor retail and commercial uses. No changes are proposed to the vehicle access configuration.

¹ Approximate intersection spacing is measured from the stop bar on Allen Street East at King Street South to the center of the driveway connection.

Estimated Trip Generation

Existing Land Uses

The site trip generation of the current land uses reflects information in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*² for land use code (LUC) 710 (General Office Building). ITE defines a general office building as “a location where affairs of businesses, commercial or industrial organizations, or professional persons or firms are conducted. An office building houses multiple tenants that can include, as examples, professional services, insurance companies, investment brokers, a banking institution, a restaurant, or other service retailers.”

Table 1 summarizes the estimated trip generation based on the gross floor area (GFA) of the building in a general urban/suburban setting. It is estimated the site generates 189 trips in the weekday AM peak hour and 187 trips in the weekday PM peak hour. **Appendix A** contains the relevant ITE data sheets.

TABLE 1: ESTIMATED TRIP GENERATION – EXISTING LAND USES

LUC ¹	GFA (sq. ft.)	AM Peak Hour				PM Peak Hour			
		Rate	In	Out	Total	Rate	In	Out	Total
710	115,170	Eqn. ²	166	23	189	Eqn. ³	32	155	187
Total Trip Generation			166	23	189		32	155	187

Notes:

1. The independent variable (X) in the regression equations is equal to the gross floor area divided by 1,000.

2. LUC 710 (AM): $\ln(T) = 0.86\ln(X) + 1.16$ (88% entering, 12% exiting)

3. LUC 710 (PM): $\ln(T) = 0.83\ln(X) + 1.29$ (17% entering, 83% exiting)

Proposed Land Uses

The site trip generation of the proposed land uses also reflects information in the Institute of Transportation Engineers (ITE) *Trip Generation Manual* for land use code (LUC) 221 (Multifamily Housing (Mid-Rise)) and LUC 822 (Strip Retail Plaza (less than 40,000 sq. ft. GFA)).

LUC 822 is intended to capture the wide variety of commercial or retail land uses that may be present on the site because the tenants for the ground floor commercial space(s) are unknown.

Table 2 summarizes the estimated trip generation of the proposed land uses in a general urban/suburban environment. The site is forecast to generate 86 trips in the weekday AM peak

² Institute of Transportation Engineers, *Trip Generation Manual*, 11th ed., (Washington, DC: ITE, 2021).



hour and 164 trips in the weekday PM peak hour. **Appendix A** contains the relevant ITE data sheets.

TABLE 2: ESTIMATED TRIP GENERATION – PROPOSED LAND USES

LUC ¹	Units	GFA (sq. ft.)	AM Peak Hour				PM Peak Hour			
			Rate	In	Out	Total	Rate	In	Out	Total
221	129	-	Eqn. ²	11	35	46	Eqn. ³	32	19	51
822	-	16,820	2.36 ⁴	24	16	40	Eqn. ⁵	56	57	113
Total Trip Generation				35	51	86		88	76	164

Notes:

1. The independent variable (X) in the regression equations is equal to the number of units for LUC 222, and for LUC 822, the gross floor area divided by 1,000.

2. LUC 221 (AM): $T = 0.44(X) - 11.61$ (23% entering, 77% exiting)

3. LUC 221 (PM): $T = 0.39(X) + 0.34$ (61% entering, 39% exiting)

4. LUC 822 (AM): (60% entering, 40% exiting)

5. LUC 822 (PM): $\ln(T) = 0.71\ln(X) + 2.72$ (50% entering, 50% exiting)

Trip Generation Summary

Table 3 summarizes the net change in trip generation between the existing and proposed land uses. The proposed redevelopment is estimated to generate 103 fewer trips in the weekday AM peak hour and 23 fewer trips in the weekday PM peak hour, with some change in the distribution of inbound versus outbound trips.

TABLE 3: NET CHANGE IN TRIP GENERATION

Land Uses	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Existing Land Uses (115,170 sq. ft. General Office)	166	23	189	32	155	187
Proposed Land Uses (129 residential units and 16,820 sq. ft. Ground Floor Commercial/Retail)	35	51	86	88	76	164
Net Change	-131	+28	-103	+56	-79	-23

The trip generation estimates do not consider trip reductions for mode share beyond those which are included in the ITE data which can be considered conservative. The site is in Waterloo's Urban Growth Centre and is a one-minute walk from the Allen ION rapid transit station. Internal capture reductions were not calculated for the redevelopment for those trips



that occur between the residential units and the ground floor commercial space. This further emphasizes the conservative nature of the trip generation estimate.

The net change in trip generation represents fewer vehicle trips in either peak hour. Therefore, the adaptive re-use of the site is forecast to have a negligible impact on traffic operations near the site.

Findings, Conclusions and Recommendations

The findings of the Trip Generation Letter are as follows:

- ▶ It is estimated that the existing land uses generate 189 trips in the weekday AM peak hour and 187 trips in the weekday PM peak hour;
- ▶ The proposed development is estimated to generate 86 trips in the weekday AM peak hour and 164 trips in the weekday PM peak hour; and
- ▶ Compared to the existing land uses, it is estimated that the proposed development will generate 103 fewer trips in the weekday AM peak hour and 23 fewer trips in the weekday PM peak hour, with some change in the distribution of inbound versus outbound trips.

Based on these findings it is concluded that the site is forecast to have a negligible impact on traffic operations near the site.

Yours very truly,

PARADIGM TRANSPORTATION SOLUTIONS LIMITED



Andrew Steinsky
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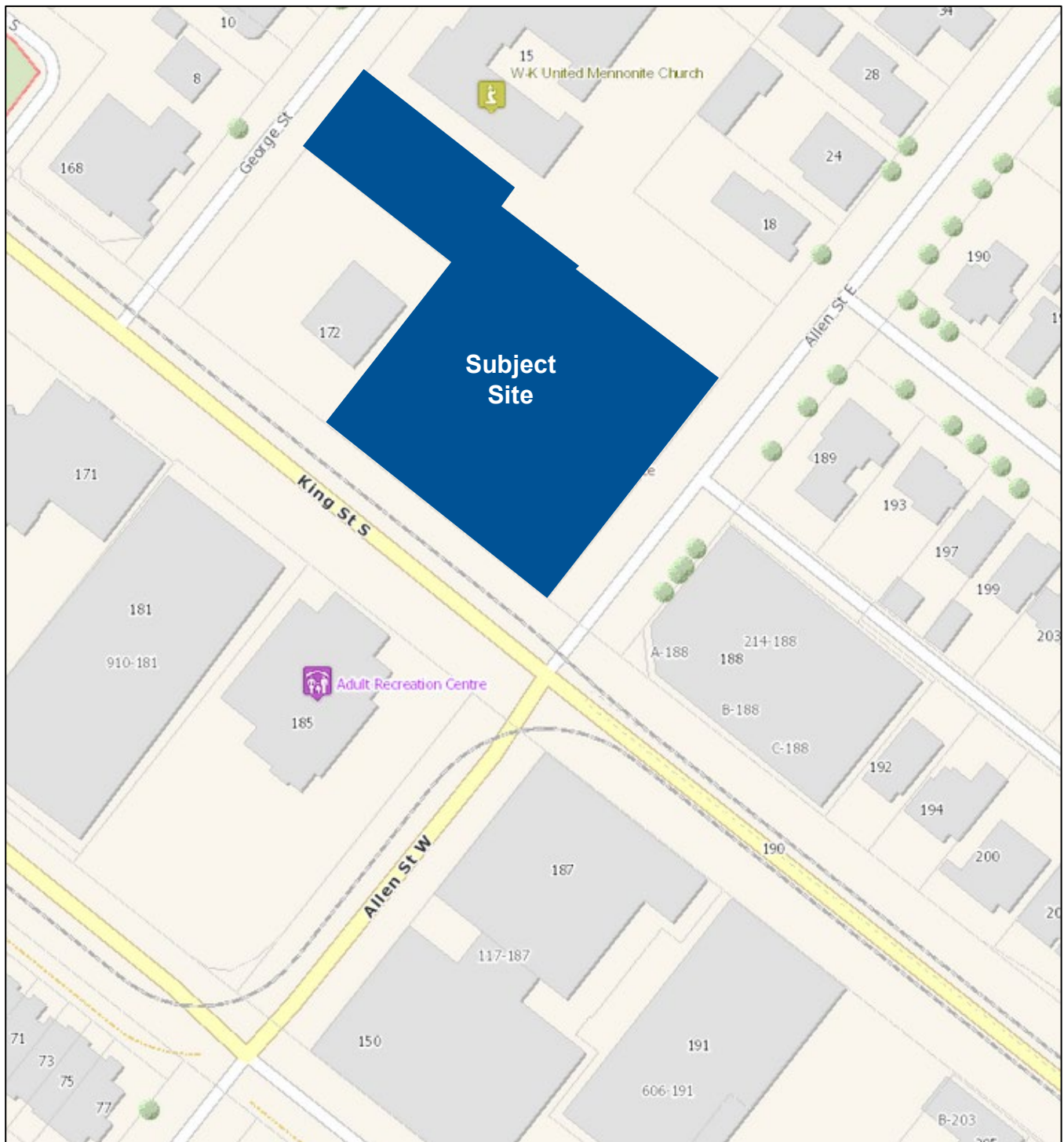
Appendix A

ITE Trip Generation Manual Excerpts



Attachments





Not to Scale

Image Source: City of Waterloo Interactive Map

(<https://www.waterloo.ca/en/government/maps-and-open-data.aspx>)



Location of Subject Site