MEMO

Date: December 8, 2023

To: Raad Akrawi, 12714001 Canada Inc.

From: Bomo Dambo, EIT, JLR
Rani Nahas, P.Eng., JLR

CC: Carmine Zayoun, 12714001 Canada Inc.
Karla Ferrey, P.Eng., JLR

Subject: 3070 Navan Development Blocks 14, 15, 16, and 17 – Trip Generation Technical Memorandum

JLR No.: 29899-005

Introduction

From the information provided, it is our understanding that the proponent is moving forward with the site plan applications for Blocks 14, 15, 16, and 17 of the 3079 Navan development. Blocks 14, 15, and 17 are each comprised of two 4-storey condo buildings with approximately 83 to 96 total units per block. Access to the main apartment building and its underground parking will be provided via the internal subdivision. Block 16 is a commercial block consisting of a gas station and drive-through restaurant. The proposed Site Plan is provided in **Attachment A**. The Transportation Impact Assessment (TIA) for the entirety of the 3079 Navan development (i.e., the condo buildings, gas station, and subdivision) was previously submitted in September 2022.

As part of the Site Plan Phase 1 comments, City staff indicated that a technical memorandum outlining the projected site trip generation for each Block will be required to satisfy the transportation analysis component of this application.

As such, the following technical memorandum has been prepared to determine the projected site-generated traffic from Blocks 14, 15, 16 and 17, and provide recommendations, as required.

Trip Generation Analysis

The latest Site Plan indicates the following for each block:

- Block 14 will consist of two 4-storey condominium buildings (Building A and Building B)
  - Building A – 48 units
  - Building B – 36 units with a 10,000 square feet commercial and office space
- Block 15 will consist of two 4-storey condominium building (Building C and Building D)
  - Building C – 36 units with a10,000 square feet commercial and office space
  - Building D – 47 units
- Block 16 is a commercial block and will consist of:
  - A gasoline service station
  - A fast-food restaurant with drive-through
- Block 17 will consist of two 4-storey condominium buildings (Building E and Building F)
  - Building E – 48 units
  - Building F – 48 units

Consistent with the City's Transportation Impact Assessment (TIA) Guidelines, projected site-generated traffic was estimated using appropriate trip generation rates from the 11th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual for commercial trips and the latest TRANS Trip Generation Manual Summary Report, dated October

21, 2020 for residential trips. Based on the location and type of development envisioned, the following **Table 1** summarizes the appropriate trip generation rates for estimating projected site-generated traffic.

Note that in the initial TIA, the trip generation rates used were from the 10th Edition of the ITE Trip Generation Manual. Since then, the 11th Edition has been released and was used for this exercise. As such, there are slight discrepancies between the trip generation rates between the TIA submitted in September 2022 and the following memo.

Table 1: ITE and TRANS Peak Hour Trip Generation Rates

Land Use	ITE Land Use Code	AM Peak Hour	PM Peak Hour
Multifamily Housing (Mid-Rise)	ITE 221 TRANS Study Table 3 & 4 Person Trips	$T_P = 0.80(U) \times 0.50$	$T_P = 0.90(U) \times 0.44$
Gasoline/Service Station with Convenience Market	ITE 945 General Urban/Suburban Vehicle Trips	$T_A = 91.35(X)$; T_F = n/a	$T_A = 78.95(X)$; T_F = n/a
Fast Food Restaurant with Drive-Through Window	ITE 934 General Urban/Suburban Vehicle Trips	$T_A = 44.61(X)$; T_F = n/a	$T_A = 33.03(X)$; T_F = n/a
Notes:	T_A = *Average Vehicle Trips* T_F = *Vehicle Trips by Fitted Curve* *X = 1,000* ft^2 *of Gross Floor Area (GFA)* T_P = *Average Person Trips* *U = Per Unit*		

Based on the foregoing, the projected weekday morning and afternoon peak hour person trip generation for the proposed development is summarized in **Table 2**.

Table 2: Modified Peak Hour Person Trips

Block	Land Use	Supply	AM Peak Hour (Person Trips/h)			PM Peak Hour (Person Trips/h)		
			In	Out	Total	In	Out	Total
14	Multifamily Housing (Mid-Rise)	84 units	10	24	34	19	14	33
15	Multifamily Housing (Mid-Rise)	83 units	10	23	33	19	14	33
17	Multifamily Housing (Mid-Rise)	96 units	11	27	38	22	16	38
16	Gasoline/Service Station with Convenience Market	2,982 ft^2	174	175	349	150	151	301
	Fast Food Restaurant with Drive-Through Window	3,897 ft^2	113	110	223	85	80	165
		Total Person Trips	318	359	677	295	275	570
		10% Multi-Purpose Trip Reduction	-32	-36	-68	-29	-27	-56
		Total 'New' Person Trips	**286**	**323**	**609**	**266**	**248**	**514**

As summarized in **Table 2**, Block 14 is projected to generate an approximate two-way total of 34 and 33 person trips/h during the weekday morning and afternoon peak hours, respectively. Block 15 is projected to generate an approximate two-way total of 33 person trips/h during both weekday peak hours. Block 17 is projected to generate an approximate two-way total of 38 person trips/h during both weekday peak hours. Block 16 is projected to generate an approximate two-way total of 572 and 466 person trips/h during the weekday morning and afternoon peak hours, respectively.

In total, Blocks 14 to 17 are projected to generate an approximate two-way total of 609 and 514 person trips/h during the weekday morning and afternoon peak hours, respectively including a 10% multi-purpose trip reduction.

Directional splits (i.e., inbound vs. outbound trips) were obtained from the TRANS Trip Generation Manual Summary Report. Additionally, given the proposed development is considered mixed-use, a 'multi-purpose' trip reduction of 10% was assumed to account for the internal trips between residential and commercial land uses.

Travel Mode Shares

To determine the number of person trips arriving/departing by travel mode, total projected person trips were subdivided by percent mode shares. To remain consistent with previously completed and approved work, the mode shares for each land use identified in the TIA has been carried forward within this memo. The following **Table 3**, **Table 4**, **Table 5**, **Table 6**, **Table 7**, and **Table 8** summarize the appropriate mode share values that were used for analysis purposes, based on the proposed land uses.

Given the nature of the proposed land uses, it should be noted that a percentage of the projected site-generated trips can be attributed to 'pass-by' traffic (i.e., a quick diversion to/from the subject development on someone's otherwise, normal daily commute). This additional 'pass-by' traffic does not impact overall network capacity, as this traffic already exists and is using the adjacent transportation network; however, 'pass-by' trips do impact the performance of turning movements at intersections within close proximity to the proposed development, typically where development site access/egress is provided. As such, and for analysis purposes, it was assumed approximately 80% and 50% of projected site-generated traffic will be comprised of 'pass-by' trips for the proposed gas station/convenience store and the fast-food restaurant land uses, respectively.

Table 3: Projected Modal Site Generated Trips – Multifamily Housing (Mid-Rise) – Block 14

Travel Mode	Mode Share	AM Peak Hour (Person Trips/h)			PM Peak Hour (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	50%	5	11	16	9	7	16
Auto Passenger	10%	1	3	4	2	2	4
Transit	30%	3	6	9	5	3	8
Non-motorized	10%	0	2	2	1	1	2
Total Person Trips	100%	9	22	31	17	13	30
Total 'New' Vehicle Trips		**5**	**11**	**16**	**9**	**7**	**16**

As shown in **Table 3**, Block 14 is projected to generate approximately two-way vehicle volumes of 16 veh/h during both weekday morning and afternoon peak hours. With regard to active modes, Block 14 is projected to generate approximately two-way person trips of 2 persons/h, during both weekday morning and afternoon peak hours. With regard to transit trips during weekday morning and afternoon peak hour, Block 14 is projected to generate approximately two-way person trips of 9 persons/h and 8 persons/h, respectively.

Table 4: Projected Modal Site Generated Trips – Multifamily Housing (Mid-Rise) – Block 15

Travel Mode	Mode Share	AM Peak Hour (Person Trips/h)			PM Peak Hour (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	50%	5	11	16	9	7	16
Auto Passenger	10%	1	2	3	2	2	4
Transit	30%	3	6	9	5	3	8
Non-motorized	10%	0	2	2	1	1	2
Total Person Trips	100%	9	21	30	17	13	30
Total ‘New’ Vehicle Trips		**5**	**11**	**16**	**9**	**7**	**16**

As shown in **Table 4**, Block 15 is projected to generate approximately two-way vehicle volumes of 16 veh/h during both weekday morning and afternoon peak hours. With regard to active modes, Block 15 is projected to generate approximately two-way person trips of 2 persons/h, during both weekday morning and afternoon peak hours. With regard to transit trips during weekday morning and afternoon peak hours, Block 15 is projected to generate approximately two-way person trips of 9 persons/h and 8 persons/h, respectively.

Table 5: Projected Modal Site Generated Trips – Multifamily Housing (Mid-Rise) – Block 17

Travel Mode	Mode Share	AM Peak Hour (Person Trips/h)			PM Peak Hour (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	50%	5	12	17	10	7	17
Auto Passenger	10%	1	3	4	2	2	4
Transit	30%	3	7	10	6	4	10
Non-motorized	10%	1	2	3	2	1	3
Total Person Trips	100%	10	24	34	20	14	34
Total ‘New’ Vehicle Trips		**5**	**12**	**17**	**10**	**7**	**17**

As shown in **Table 5**, Block 17 is projected to generate approximately two-way vehicle volumes of 17 veh/h during both weekday morning and afternoon peak hours. With regard to active modes, Block 17 is projected to generate approximately two-way person trips of 3 persons/h, during both weekday morning and afternoon peak hours. With regard to transit trips during both weekday morning and afternoon peak hours, Block 17 is projected to generate approximately two-way person trips of 10 persons/h.

Table 6: Projected Modal Site Generated Trips – Gasoline Service Station – Block 16

Travel Mode	Mode Share	AM Peak Hour (Person Trips/h)			PM Peak Hour (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	70%	110	111	221	95	96	191

Auto Passenger	15%	24	24	48	21	21	42
Transit	5%	8	8	16	6	6	12
Non-motorized	10%	15	15	30	13	13	26
Total Person Trips	100%	157	158	315	135	136	271
	Less Pass-by 80%	-88	-88	-176	-76	-76	-152
	Total 'New' Vehicle Trips	**22**	**23**	**45**	**19**	**20**	**39**

As shown in **Table 6**, the gasoline service station in Block 16 is projected to generate approximately two-way vehicle volumes of 45 veh/h during the weekday morning peak hour and 39 veh/h during the afternoon peak hour. With regard to active modes, the gas station is projected to generate approximately two-way person trips of 30 persons/h and 26 persons/h during the weekday morning and afternoon peak hours, respectively. With regard to transit trips during both weekday morning and afternoon peak hours, the gasoline service station in Block 16 is projected to generate approximately two-way transit trips of 16 and 12 person trips/h, respectively.

Table 7: Projected Modal Site Generated Trips – Fast Food Restaurant – Block 16

Travel Mode	Mode Share	AM Peak Hour (Person Trips/h)			PM Peak Hour (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	60%	62	60	122	47	44	91
Auto Passenger	10%	10	10	20	8	7	15
Transit	20%	20	20	40	15	14	29
Non-motorized	10%	10	9	19	7	7	14
Total Person Trips	100%	102	99	201	77	72	149
	Less Pass-by 50%	-31	-31	-62	-23	-23	-46
	Total 'New' Vehicle Trips	**31**	**29**	**60**	**24**	**21**	**45**

As shown in **Table 7**, the fast-food restaurant in Block 16 is projected to generate approximately two-way vehicle volumes of 60 veh/h during the weekday morning peak hour and 45 veh/h during the afternoon peak hour. With regard to active modes, the restaurant is projected to generate approximately two-way person trips of 19 persons/h and 14 persons/h during the weekday morning and afternoon peak hours, respectively. With regard to transit trips, the restaurant is projected to generate approximately two-way person trips of 40 persons/h and 29 persons/h during the weekday morning and afternoon peak hours, respectively.

Table 8: Projected Modal Site Generated Trips – Block 16 Total

Travel Mode	AM Peak Hour (Person Trips/h)			PM Peak Hour (Person Trips/h)		
	In	Out	Total	In	Out	Total
Auto Driver	172	171	343	142	140	282
Auto Passenger	34	34	68	29	28	57
Transit	28	28	56	21	20	41
Non-motorized	25	24	49	20	20	40

Total Person Trips	259	257	516	212	208	420
Less Pass-by 50%	-119	-119	-238	-99	-99	-198
Total 'New' Vehicle Trips	**53**	**52**	**105**	**43**	**41**	**84**

As shown in **Table 8*Table 7***, Block 16, in total, is projected to generate approximately two-way vehicle volumes of 105 veh/h during the weekday morning peak hour and 84 veh/h during the afternoon peak hour. With regard to active modes, Block 16 is projected to generate approximately two-way person trips of 49 persons/h and 40 persons/h during the weekday morning and afternoon peak hours, respectively. With regard to transit trips, Block 16 is projected to generate approximately two-way person trips of 56 persons/h and 41 persons/h during the weekday morning and afternoon peak hours, respectively.

Findings and Conclusions

Based on the foregoing, the following conclusions are made:

- Block 14 is projected to generate approximate two-way vehicle volumes of 16 veh/h during both weekday morning and afternoon peak hours.
- Block 15 is projected to generate approximate two-way vehicle volumes of 16 veh/h during both weekday morning and afternoon peak hours.
- Block 16 is projected to generate approximate two-way vehicle volumes of 105 veh/h during the weekday morning peak hour and 84 veh/h during the afternoon peak hour.
- Block 17 is projected to generate approximate two-way vehicle volumes of 17 veh/h during both weekday morning and afternoon peak hours.

Sincerely,

J.L. RICHARDS & ASSOCIATES LIMITED

Prepared by:

Dambo

Bomo Dambo, EIT
Transportation Engineer-In-Training

Reviewed by:

LICENSED PROFESSIONAL ENGINEER
Rani Nahas
R. R. NAHAS
100509225
2023-12-08
PROVINCE OF ONTARIO

Rani Nahas, P.Eng.
Transportation Engineer

Attachments

Attachment A

Site Plan

1 2983, NAVAN ROAD - SITE PLAN
1 : 550

Autodesk Docs://NAVAN ROAD/20054_DEV-NAVAN_SITE_PLAN_R24.rvt

LOTS AREAS

LOT NUMBER	AREAS (M2)	LOT NUMBER	AREAS (M2)
B01-1	394	B06-4	154
B01-2	184	B06-5	163
B01-3	184	B06-6	154
B01-4	189	B06-7	369
B01-5	189	B07	2,002
B01-6	184	B08-1	525
B01-7	184	B08-2	174
B01-8	299	B08-3	184
B02-1	281	B08-4	174
B02-2	176	B08-5	184
B02-3	184	B08-6	174
B02-4	184	B08-7	234
B02-5	174	B09-1	234
B02-6	233	B09-2	174
B03-1	250	B09-3	184
B03-2	182	B09-4	184
B03-3	182	B09-5	174
B03-4	182	B09-6	234
B03-5	182	B10-1	234
B03-6	182	B10-2	174
B03-7	250	B10-3	184
B04-1	233	B10-4	184
B04-2	174	B10-5	174
B04-3	184	B10-6	487
B04-4	174	B11-1	748
B04-5	184	B11-2	286
B04-6	174	B11-3	265
B04-7	278	B11-4	246
B05-1	368	B11-5	242
B05-2	154	B11-6	242
B05-3	163	B11-7	321
B05-4	163	B12	240
B05-5	154	B13	1,232
B05-6	206	B14	5,728
B06-1	206	B15	5,399
B06-2	154	B16	7,811
B06-3	163	B17	5,312

SITE PLAN LEGEND

☐	EXISTING BUILDING	‐·‐	LOT LINE
■	NEW BUILDING	‐ ‐ ‐	SETBACKS
▨	NEW BUILDING WITH COMMERCIAL SPACE AT-GRADE	✳	NEW TREE
🟩	GRASS	▬	FIREWALL
■	ASPHALT	■	SIDEWALK

SITE INFORMATION & DEVELOPMENT STATISTICS

	REQUIRED	PROVIDED
LOTS		PIN
		04756 - 0303
		04756 - 0315
		04756 - 0316
		04756 - 1337
ZONING		GM[2546] H(14.5)
SITE AREA		
TOTAL SITE AREA:		~53,441.14 m² (5.34ha)
TOTAL DEVELOPABLE AREA:		~45,956.28 m² (4.59ha)
NET SITE AREA:		~38,956.28 m² (3.89ha)
UNITS		
TOWNHOUSES:		67 UNITS
BLOCK 01:		
1 X RESIDENTIAL APARTMENT BUILDING		48 UNITS
1 X MIXED USE BUILDING		
RESIDENTIAL:		36 UNITS
COMMERCIAL SPACES:		~929 m²
BLOCK 02:		
1 X RESIDENTIAL APARTMENT BUILDING		47 UNITS
1 X MIXED USE BUILDING		
RESIDENTIAL:		36 UNITS
COMMERCIAL SPACES:		~929 m²
BLOCK 03:		
2 X RESIDENTIAL APARTMENT BUILDING		96 UNITS
TOTAL NUMBER OF UNITS:		330 UNITS
TOTAL COMMERCIAL SPACES:		~1,858 m²
MAXIMUM DENSITY	NO MAX.	84.8 units/net ha
MINIMUM LOT WIDTH	NO MIN.	5.8 m
MINIMUM LOT AREA	NO MIN.	174 m²
MAXIMUM BUILDING HEIGHT	14.5 m	14.5 m
SETBACKS		
MINIMUM FRONT YARD:	3 m	3 m
MINIMUM CORNER SIDE YARD:	3 m	3 m
MINIMUM INTERIOR SIDE YARD:		
NON-RESIDENTIAL OR MIXED-USE:	5 m	5 m
LOW-RISE RESIDENTIAL :	1.2 m	1.2 m
MID-RISE RESIDENTIAL :	3 m	3 m
MINIMIM REAR YARD:		
ABUTTING A STREET:	3 m	3 m
FROM A RESIDENTIAL ZONE:	7.5 m	7.5 m
FOR A RESIDENTIAL BUILDING:	7.5 m	7.5 m
PARKING RATES		
R9 - TOWNHOUSES:	1 p/unit = 67	67 (GARAGES)
VISITOR:	0	67 DRIVE AISLES
BLOCK 14:		
R12 - APARTEMENTS	1.2 p/unit = 101	101 (UNDERGROUND)
VISITOR:	0.2 p/unit = 17	17 (UNDERGROUND)
N79 - RETAIL STORE:	3.4 p/100 m² GFA = 32	32 (EXTERIOR)
		TOTAL: 150
BLOCK 15:		
R12 - APARTEMENTS	1.2 p/unit = 100	100 (UNDERGROUND)
VISITOR:	0.2 p/unit = 17	17 (UNDERGROUND)
N79 - RETAIL STORE:	3.4 p/100 m² GFA = 32	32 (EXTERIOR)
		TOTAL: 150
BLOCK 18:		
R12 - APARTEMENTS	1.2 p/unit = 116	145 (UNDERGROUND)
VISITOR:	0.2 p/unit = 17	17 (8 EXT. + 12 UND.)
		TOTAL: 162
GROSS FLOOR AREA		
TOWNHOUSE A:		267 m²
TOWNHOUSE B:		239 m²
TOWNHOUSE C:		232 m²
TOWNHOUSE C (CORNER UNIT):		236 m²
TOWNHOUSE D:		225 m²
TOTAL MODEL 01 (ABBBBBBA)		1,968 m²
TOTAL MODEL 02 (ABBBBBA)		1,729 m²
TOTAL MODEL 03 (ABBBBA)		1,490 m²
TOTAL MODEL 04 (CDCDCDC)		1,611 m²
TOTAL MODEL 05 (CDCCDC)		1,386 m²
MIXED USE BUILDING (TOTAL OF 2 BUILDINGS):		TOTAL: 4,130 m²
RESIDENTIAL:		3,201 m²
COMMERCIAL:		929 m²
RESIDENTIAL APARTMENT BUILDING (TOTAL OF 4 BUILDINGS) :		TOTAL: 4,130 m²
RESIDENTIAL:		4,130 m²

NOTE

1. ASSUMES TYPICAL RESIDENTIAL FLOOR HEIGHT OF 3m.
2. THE BASE PLAN (LOT LINES, EXISTING ROADS AND SURROUNDING AREAS) IS BASED ON THE TOPOGRAPHICAL PLAN OF SURVEY, SURVEYED STANTEC GEOMATICS LTD.
3. DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0,3048.

PROJECT

NAVAN ROAD
DEVELOPMENT

2983, Navan Road, Orleans,
ON K1C 7G4

OWNER

Groupe Heafey Group
768, BOUL. SAINT-JOSEPH, SUITE 100
GATINEAU, QC J8Y 4B8

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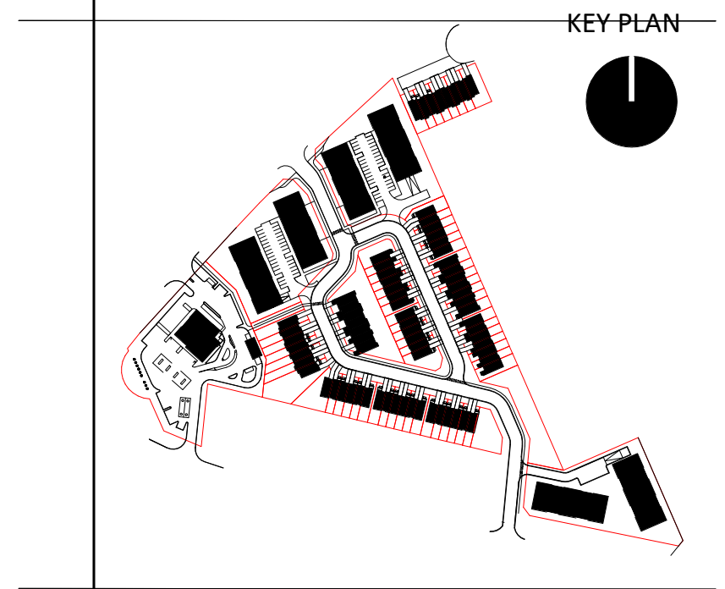
SURVEYOR

Stantec
1331 CLYDE AVENUE, SUITE 400,
OTTAWA, ON K2C 3G4

KEY PLAN



ARCHITECT SEAL

REVISIONS

NO	DESCRIPTION	DATE
8	FOR CITY REVIEW	2022-11-28
7	FOR COORDINATION	2022-11-08
6	FOR COORDINATION	2022-11-01
5	FOR COORDINATION	2022-04-14
4	FOR COORDINATION	2021-11-03
3	FOR COORDINATION	2021-08-30
2	FOR COORDINATION	2021-08-26
1	FOR COORDINATION	2021-08-18

NOTE

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON THE SITE AND TO REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT. ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS. DO NOT SCALE DRAWINGS.

DO NOT USE FOR
CONSTRUCTION

DATE
2023-11-29

DESIGNED
PP

DRAWN
PP

PROJECT No
20054

CHECKED
PM

SHEET TITLE

SITE PLAN

SHEET No

A100