



Technical Memorandum

To: Mike Giampa, P.Eng. Date: 2025-03-10

Cc: Connor Gallagher, P.Eng.- Concorde Properties

From: Reihaneh Azhdar, Andrew Harte, P.Eng. Project Number: 2025-215

Re: 114 Richmond Road Traffic Review Memo

Introduction

The proposed development is located at 114 Richmond Road and encompasses the Phase 2 development area on the parcel. The proposed site includes a residential building, including 126 stacked townhome units and 47 apartment units. The site is proposed to use the existing access onto Leighton Terrace as per Phase 1 development. The site is located within the Richmond Road/Westboro Community Design Plan area. The anticipated build-out is 2030. The proposed site plan is provided in Attachment 1.

A TIA was previously approved in 2020 to support Phase 2 of the Q West development including a new nine-storey residential building with 161 dwelling units and reprogramming of the Convert building to include 1,700 sq. m of commercial space (two restaurants), five residential units, and amenity space. The TIA was prepared and submitted by Parsons in January 2020. Overall, the new site proposes seven additional dwelling units while removing the previously proposed commercial space.

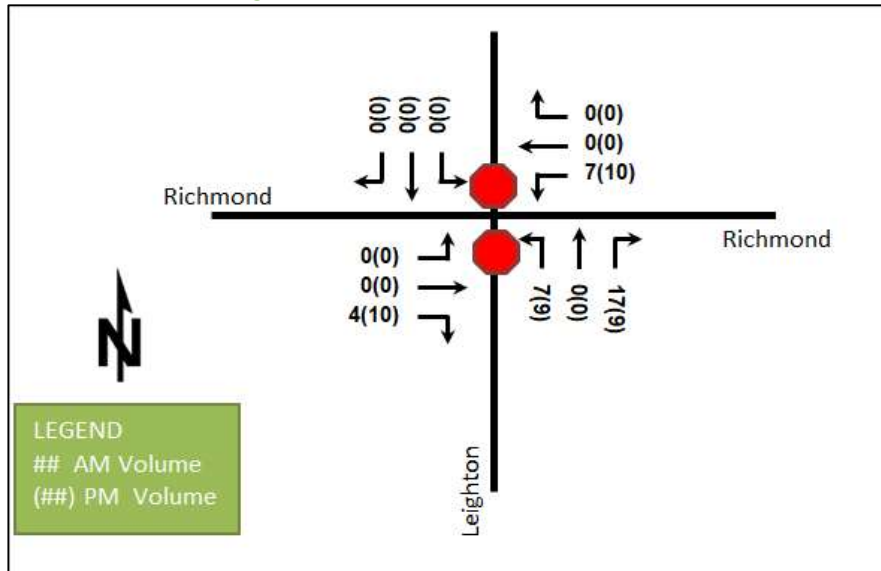
To support the site, the TIA screening form was prepared, including a comparison between the site trips generated by the proposed site plan and in the previously approved TIA. The recommendation was that no TIA was required for the site, and this was confirmed with the City during a scoping call on January 29, 2025. A memo was requested to review the operations of the Richmond Road at Leighton Terrace intersection and provide a review of the site plan. It should be noted that the screening form has been updated to reflect minor changes in the proposed site plan. This memo has been prepared to meet these requirements, and the screening form is provided in Attachment 2.

Trip Generation

As summarized in the TIA Screening Form, the proposed development is forecast to generate 34 AM and 37 PM new peak hour two-way vehicle trips. Compared to the previous approvals for the site, the proposed site plan will result in reductions of one vehicle trips during the AM peak hour and 72 vehicle trips during the PM peak hour.

Assuming the distribution outlined in the previously approved TIA (Parsons, 2020), the trips generated by the proposed site have been assigned to the study area road network. Figure 1 illustrates the new site generated volumes.

Figure 1: New Site Generation Auto Volumes



Existing Conditions

The adjacent roadways to the site include Richmond Road and Leighton Terrace. Richmond Road is the City of Ottawa arterial road with a four-lane urban cross-section including sidewalks on both sides of the road. The posted speed limit is 50 km/h, and the existing right of way is 20.0 metres. Richmond Road is designated as a truck route. Leighton Terrace is the City of Ottawa local road with a two-lane urban cross-section including sidewalks on both sides of the road for approximately 43 metres south of Richmond Road. The unposted speed limit is assumed to be 40 km/h, and the existing right of way is 15.0 metres.

The intersection of Richmond Road at Leighton Terrace is a stop-control intersection with Richmond Road functioning as free-flow. A restaurant driveway is located on the north leg of the intersection.

Traffic Conditions

Existing turning movement counts were acquired from the J & S Traffic Services for the intersection of Richmond Road at Leighton Terrace. Table 1 summarizes the intersection count date and source.

Table 1: Intersection Count Date

Intersection	Count Date	Source
Richmond Road at Leighton Terrace	Thursday, February 05, 2026	J & S Traffic Services

It should be noted that construction activity was occurring along the south side of Richmond Road west of Island Park Drive during the data collection. Figure 2 illustrates the existing traffic counts and Table 2 summarizes the existing intersection operations. The level of service is based on average delay for unsignalized intersections. Detailed turning movement count data is included in Attachment 3, and the Synchro worksheets are provided in Attachment 4.

Figure 2: Existing Traffic Counts

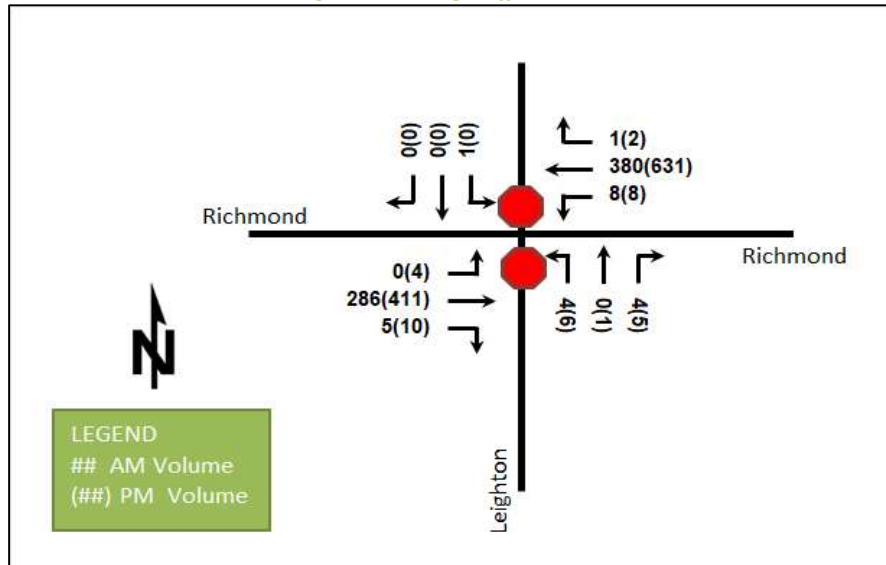


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Richmond Road at Leighton Terrace (Unsignalized)	EB	A	-	0.0	0.0	A	0.01	9.5	0.0
	WB	A	0.01	8.8	0.0	A	0.01	8.5	0.0
	NB	B	0.02	13.9	0.8	C	0.05	17.8	0.8
	SB	C	0.00	15.9	0.0	A	-	0.0	-
	Overall	A	-	0.4	-	A	-	0.4	-

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 0.90

Delay = average vehicle delay in seconds
m = metered queue
= volume for the 95th %ile cycle exceeds capacity

During both the AM and PM peak hours, the study area intersection operates well. No capacity issues are noted.

Signal warrant analysis of Justifications 1 to 4 was performed for the study area intersection, and the warrants were not met. Signal warrant calculation sheets are provided in Attachment 5.

Left-turn lane warrant analysis was performed for the study area intersection, with both the eastbound and westbound left-turn lanes meeting the warrants for consideration during the existing PM peak hour. Although the warrants were met, the operations are acceptable without the turn lanes. In addition, on-street parking is restricted from Island Park Drive to Leighton Terrace, allowing the through vehicle to bypass westbound left-turning vehicles. Therefore, the provision of dedicated left-turn lanes is not required. The left-turn warrant calculation sheets are provided in Attachment 6.

Future Traffic Volumes

Background Growth and Other Developments

A review of the background projections from the City’s TRANS Regional Model for the 2011 and 2031 horizons was completed to determine the background growth for the study area roadway. Growth rates derived from the TRANS model horizons will be applied to the mainline for the appropriate roads during the AM peak hour, rounded to the nearest 0.25%, and reversed for the PM peak hour. The background TRANS model growth rates are summarized in the Table 3 and the TRANS model plots are provided in Attachment 7.

Table 3: TRANS Regional Model Projections – Study Area Growth Rates

Street	Direction Growth % from 2022 to 2046		Recommended Area Growth Rates	
	Eastbound	Westbound	Eastbound	Westbound
Richmond Road	0.31%	1.27%	0.25%	1.25%

The background developments explicitly considered in the background conditions include:

- 1451-1445 Wellington Street (Delcan, 2013)
- 70 Richmond Road (CGH Transportation, 2023)
- 175 Richmond Road (Novatech, 2011)
- 236 Richmond Road (No TIA is available)
- 370 Athlone Avenue (No TIA is available)
- 249-255 Richmond Road & 372 Tweedsmuir Avenue (Novatech, 2025)
- 319-327 Richmond Road, 380 Winona Avenue, & 381 Churchill Avenue (CGH Transportation, 2021)

All the background developments either generate negligible traffic or result in lower volumes compared to their existing land uses. Any changes in traffic from these developments are accounted for by applying the background growth rates.

2030 Future Background/Total Conditions

Figure 3 illustrates the 2030 future background volumes and Figure 4 illustrates the 2030 future total volumes.

Figure 3: 2030 Future Background Volumes

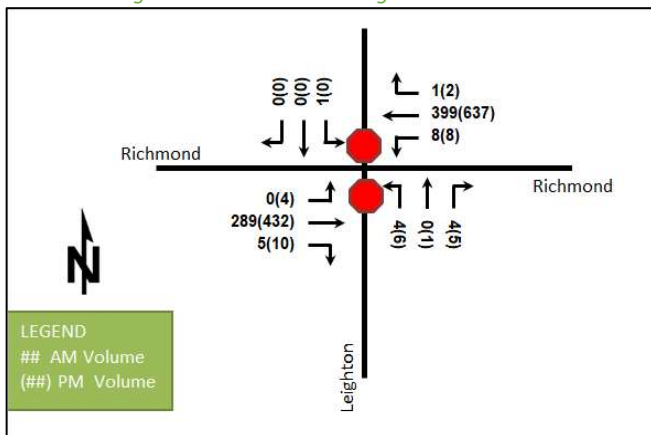
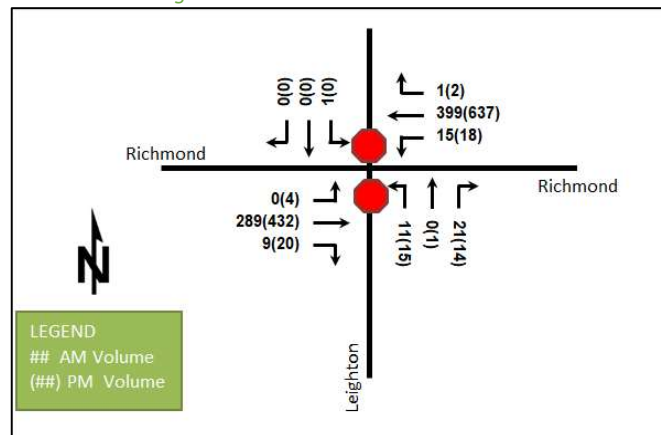


Figure 4: 2030 Future Total Volumes



Signal warrant analysis of Justification 7 was performed for the study area intersection for the 2030 future background and future total conditions, and the warrants were not met. Signal warrant calculation sheets are provided in Attachment 5.

Left-turn lane warrant analysis was performed for the study area intersection for the 2030 future background and future total conditions and the eastbound and westbound left turn lanes remain warranted. The left-turn warrant calculation sheets are provided in Attachment 6.

Site Review

Design for Sustainable Modes

A 2.0-metre-wide sidewalk is located along Leighton Terrace between the site access and Richmond Road, providing connection to the sidewalks on Richmond Road. Additionally, a pathway extends through the site east of the easternmost residential buildings and connects to the multi-use pathway located north of Byron Avenue. Existing hard surface connections link the existing residential buildings, fronting to Richmond Road, to the existing pathway and the proposed residential buildings.

Internal hard surface connections are proposed to provide access between the residential building entrances and the internal drive aisles. These connections also provide continuous pedestrian access across the site and connect to the existing pathway located east of the easternmost residential buildings and north of Byron Avenue. Each building includes multiple entrances oriented toward the internal drive aisles and internal walkways. Bicycle parking is located on the underground parking levels, accessed via a ramp. Elevators are additionally provided from the parking levels for cyclists' ease of use.

The infrastructure TDM checklist is provided in Attachment 8.

Circulation and Design of Access

Vehicle access to the residential buildings is proposed via the existing 6.1-metre-wide right-in/right-out access on Leighton Terrace. The access connects to the underground parking ramp and three surface parking spaces. In terms of the access width, the site meets the maximum width permitted for a two-way access from the Private Approach By-Law. The access is located approximately 40.0 metres south of Richmond Road. The Geometric Design Guide for Canadian Roads (TAC, 2017) suggests minimum corner clearance value for driveways of 15.0 metres along local road and thus the site access meets this guideline. The access meets the 30-metre offset requirement from the adjacent road right-of-way from the Private Approach By-Law. The Private Approach By-Law also requires a 3.0-metre from the adjacent property line; however, the existing site access is located less than 3.0 metres from an adjoining property. No changes are proposed for the existing access.

The throat length to the first on-site conflict is approximately 34.0 metres. No minimum clear throat length is provided in the TAC Geometric Design Guidelines for accesses onto local roads. However, the provision of 8.0 metres to allow a car to queue on the private approach is recommended and the existing throat length satisfies that recommendation. Therefore, the existing throat length is considered sufficient.

Garbage collection will occur on the west of the site, between the apartment building parking ramp and the stacked townhomes parking entrance. The vehicle will turn around using the hammerhead turning area before existing the site. Fire service trucks can access the site drive aisle and travel along the internal fire route, which provides a width of approximately 4.5 metres, between the stacked townhome buildings. A hammerhead turning area is provided to accommodate fire truck manoeuvring, with internal curb radii of approximately 9.0 metres. Turning templates are provided in Attachment 9.

Conclusion

The following summarizes the analysis and results presented in this report:

- The proposed site includes a residential building, including 126 stacked townhome units and 47 apartment units
- A TIA was previously approved in 2020 to support Phase 2 of the Q West development, including 161 dwelling units, 1,700 sq. m of commercial space (two restaurants), five residential units, and amenity spaces
- Overall, the new site proposes seven additional dwelling units while removing the previously proposed commercial space
- Compared to the previous TIA, the new site will result in reductions of one vehicle trips during the AM peak hour and 72 vehicle trips during the PM peak hour and therefore, no TIA is required for this development
- During both the AM and PM peak hours, the intersection of Richmond Road at Leighton Terrace operates well

- Signal warrants were not met in the existing and future conditions
- No dedicated left-turn lanes are required
- An existing sidewalk is located along Leighton Terrace, connecting to Richmond Road, and a pathway extends through the site and connects to the multi-use pathway located north of Byron Avenue
- Internal hard surface connections are proposed to provide access between the building entrances and the internal drive aisles and to connect to the existing pathway
- The access meets the offset requirements from the adjacent road right-of-way from the Private Approach By-Law
- Throat length is considered adequate, and corner clearance meets the TAC suggested minimum values
- Garbage collection will occur on the west of the site, and fire trucks can access the site drive aisles

Overall, the site plan revision is anticipated to result in a reduction in the previously approved site-generated trips, and no further analysis is required to support this application. It is recommended, from a transportation perspective, the proposed changes to the site plan application proceed.

Prepared By:

Reihaneh Azhdar

Reihaneh Azhdar
Transportation Engineering, Intern

Reviewed By:



Andrew Harte, P.Eng.
Senior Transportation Engineer

Attachment 1

Site Plan

INDICATE PLANS OF SURVEY OF
 PART OF PUBLIC
 REGISTERED PLANNING
 VIEW OF CITY MAP
 FROM: COLUMBIAN UNIVERSITY

SURVEY INFO
 SCALE: NTS

SITE PLAN SYMBOLS LEGEND

- IN-BUILDING ENTRANCE
- INTERLOCKING STONE PAVES
- PROPERTY LINE
- SETBACK LINE

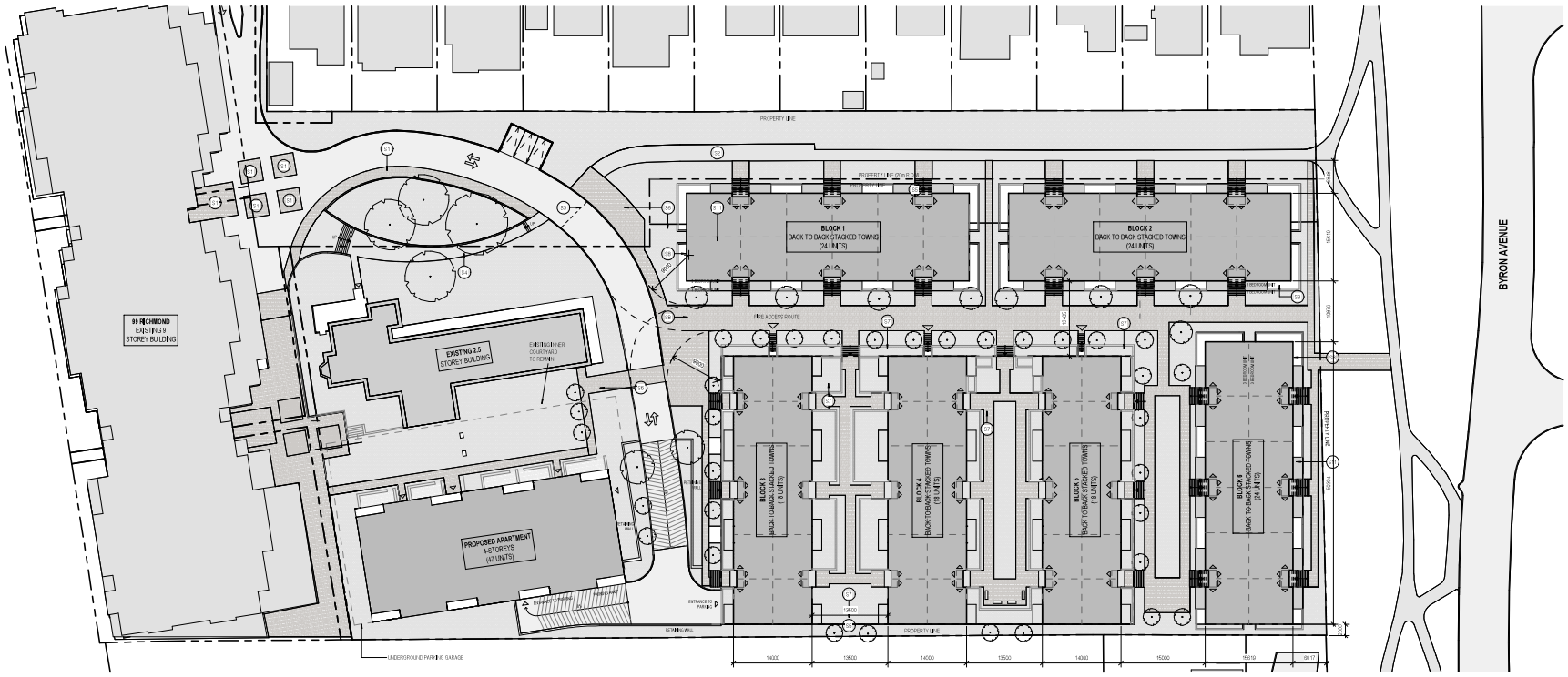
SITE PLAN NOTES

- 01 EXISTING PAVERS
- 02 EXISTING RIBBED CONCRETE PAVEMENT (PAVEMENT)
- 03 EXISTING CURB OF EXISTING PAVED DRIVEWAY
- 04 EXISTING BUILT-UP DRIVEWAY
- 05 EXISTING BUILT-UP DRIVEWAY TO BE RETAINED
- 06 PROPOSED REFINISHED DRIVEWAY
- 07 PROPOSED RIBBED CONCRETE DRIVEWAY
- 08 EXISTING DRIVEWAY
- 09 EXISTING DRIVEWAY TO BE DEMOLISHED
- 10 EXISTING DRIVEWAY TO BE DEMOLISHED
- 11 DRIVEWAY AND ENTRANCE
- 12 WATCHDOG ISLANDS PROPOSED ENTRANCE CORNERING



GENERAL ARCHITECTURAL NOTES

1. This drawing is the property of the Architect and may not be reproduced or used without the expressed consent of the Architect.
2. Drawings are not to be scaled. The Contractor is responsible for checking and verifying all dimensions and conditions and for any discrepancies in the field or on-site.
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3 SITE PLAN_UPDATED_06
 SCALE: 1:375

1 ISSUED FOR COORDINATION 2025-12-15
 ISSUE RECORD



project1 studio
 Project1 Studio Incorporated
 [1124] [2025] [1124] [2025]

114 RICHMOND ROAD

PROJ: 2511 SCALE: NOTED DRAWN: SDL REVIEWED: RMK

SITE PLAN

SP-01

Attachment 2

Screening Form

City of Ottawa 2023 Revisions to 2017 TIA Guidelines
Step 1 - Screening Form

Date: 2026-03-09
Project Number: 2025-215
Project Reference: Concorde 114 Richmond

1.1 Description of Proposed Development	
Municipal Address	114 Richmond Road
Description of Location	South of Richmond Road, west of Leighton Terrace, and north of Byron Avenue
Land Use Classification	Traditional Mainstreet Zone (TM[2570] S397, S428, TM[1763] S256), Residential Fifth Density Zone (R5B[1763] S256), Parks and Open Space Zone (O1[1763] S256, S428, O1[1763] S256)
Development Size	126 stacked townhomes and 47 apartment units
Accesses	Existing access onto Leighton Terrace, as per Phase 1
Phase of Development	Single
Buildout Year	2028
TIA Requirement	Design Review Component

1.2 Trip Generation Trigger	
Land Use Type	Multi-Family (Low-Rise)
Development Size	173 Units
Trip Generation Trigger	No See Attached Trip Gen

1.3 Location Triggers	
Does the development propose a new driveway to a boundary street that is designated as part of the Transit Priority Network, Rapid Transit network or Cross-Town Bikeways?	No
Is the development in a Hub, a Protected Major Transit Station Area (PMTSA), or a Design Priority Area (DPA)?	Yes Richmond Road/Westboro Community Design Plan
Location Trigger	Yes

1.4. Safety Triggers	
Are posted speed limits on a boundary street 80 km/hr or greater?	No
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?	No
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?	No Existing driveway
Is the proposed driveway within auxiliary lanes of an intersection?	No
Does the proposed driveway make use of an existing median break that serves an existing site?	No
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	Yes Four cyclist collisions at Byron Avenue at Kirkwood Avenue
Does the development include a drive-thru facility?	No
Safety Trigger	Yes

Table 1: Trip Generation Person Trip Rates by Peak Period-Proposed

Land Use	Land Use Code	Peak Period	Vehicle Trip Rate	Person Trip Rates
Multi-Unit Low-Rise	220 (TRANS)	AM	-	1.35
		PM	-	1.58
Multi-Unit High-Rise	221 & 222 (TRANS)	AM	-	0.80
		PM	-	0.90

Table 2: Person Trip Generation by Peak Period-Proposed

Land Use	Units	AM Peak Period			PM Peak Period		
		In	Out	Total	In	Out	Total
Multi-Unit (Low-Rise)	126	51	119	170	111	88	199
Multi-Unit (High-Rise)	47	12	26	38	24	18	42

Table 3: Trip Generation by Mode-Proposed

Travel Mode		AM Peak Hour				PM Peak Hour			
		Mode Share	In	Out	Total	Mode Share	In	Out	Total
Multi-Unit (Low-Rise)	Auto Driver	36%	9	20	29	35%	17	14	31
	Auto Passenger	12%	3	7	10	12%	6	5	11
	Transit	24%	7	16	23	16%	8	7	15
	Cycling	10%	3	7	10	10%	6	4	10
	Walking	19%	6	13	19	27%	16	12	28
	Total	100%	28	63	91	100%	53	42	95
Multi-Unit (High-Rise)	Auto Driver	28%	2	4	5	33%	3	3	6
	Auto Passenger	11%	1	1	2	11%	1	1	2
	Transit	41%	3	6	9	26%	3	2	5
	Cycling	3%	0	1	1	7%	1	0	1
	Walking	16%	1	2	3	23%	3	2	5
	Total	100%	7	14	20	100%	11	8	19
Total	Auto Driver	-	11	24	34	-	20	17	37
	Auto Passenger	-	4	8	12	-	7	6	13
	Transit	-	10	22	32	-	11	9	20
	Cycling	-	3	8	11	-	7	4	11
	Walking	-	7	15	22	-	19	14	33
	Total	-	35	77	111	-	64	50	114

Table 4: Vehicle Trip Generation Comparison

Land Use	Land Use	Units/ GFA	AM Peak Period			PM Peak Period		
			In	Out	Total	In	Out	Total
Approved TIA-2020 (Phase 2A)	Multi-Unit (High-Rise)	166	4	31	35	30	5	35
	Quality Restaurant	18,303 sq. ft	-	-	-	49	25	74
Proposed Site Plan	Multi-Unit (Low-Rise)	126	9	20	29	17	14	31
	Multi-Unit (High-Rise)	47	2	4	5	3	3	6
Net Difference	-	-	+7	-7	-1	-59	-13	-72

As shown above, the proposed site plan will result in a reduction of one vehicle trips during the AM peak hour and 72 vehicle trips during the PM peak hour when compared to the previous approvals for the site.

Considering the proposed units in isolation, these volumes do not meet the auto/transit analysis/review warrants within the TIA guidelines' exemption review; the site proposes no new access as it was studied and approved through the previous Phase. The extent of the TIA analysis would therefore be within the Phase 2 boundary for internal design (turning templates, parking provisions, etc.) which can be administered through the typical site plan review process.

Therefore, it is recommended that no TIA is required for the subject site.



Certification Form for TIA Study PM

TIA Plan Reports

On April 14, 2022, the Province’s Bill 109 received Royal Assent providing legislative direction to implement the More Homes for Everyone Act, 2022 aiming to increase the supply of a range of housing options to make housing more affordable. Revisions have been made to the TIA guidelines to comply with Bill 109 and streamline the process for applicants and staff.

Individuals submitting TIA reports will be responsible for all aspects of development-related transportation assessment and reporting, and undertaking such work, in accordance and compliance with the City of Ottawa’s Official Plan, the Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines.

By submitting the attached TIA report (and any associated documents) and signing this document, the individual acknowledges that they meet the four criteria listed below.

CERTIFICATION

- I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa’s Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines; (Update effective July 2023)
- I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
- I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
- I am either a licensed or registered¹ professional in good standing, whose field of expertise
 - is either transportation engineering
 - or transportation planning.

¹ License of registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works.

Dated at Ottawa this 17 day of August, 20 23.
(City)

Name : Andrew Harte

Professional title: Senior Transportation Engineer / Vice-President Ottawa



Signature of individual certifier that s/he/they meet the above criteria

Office Contact Information (Please Print)

Address: 6 Plaza Court

City / Postal Code: Ottawa, K2H 7W1

Telephone / Extension: 613-697-3797

Email Address: andrew.harte@cghtransportation.com

Stamp



Revision Date: June 2023

Attachment 3

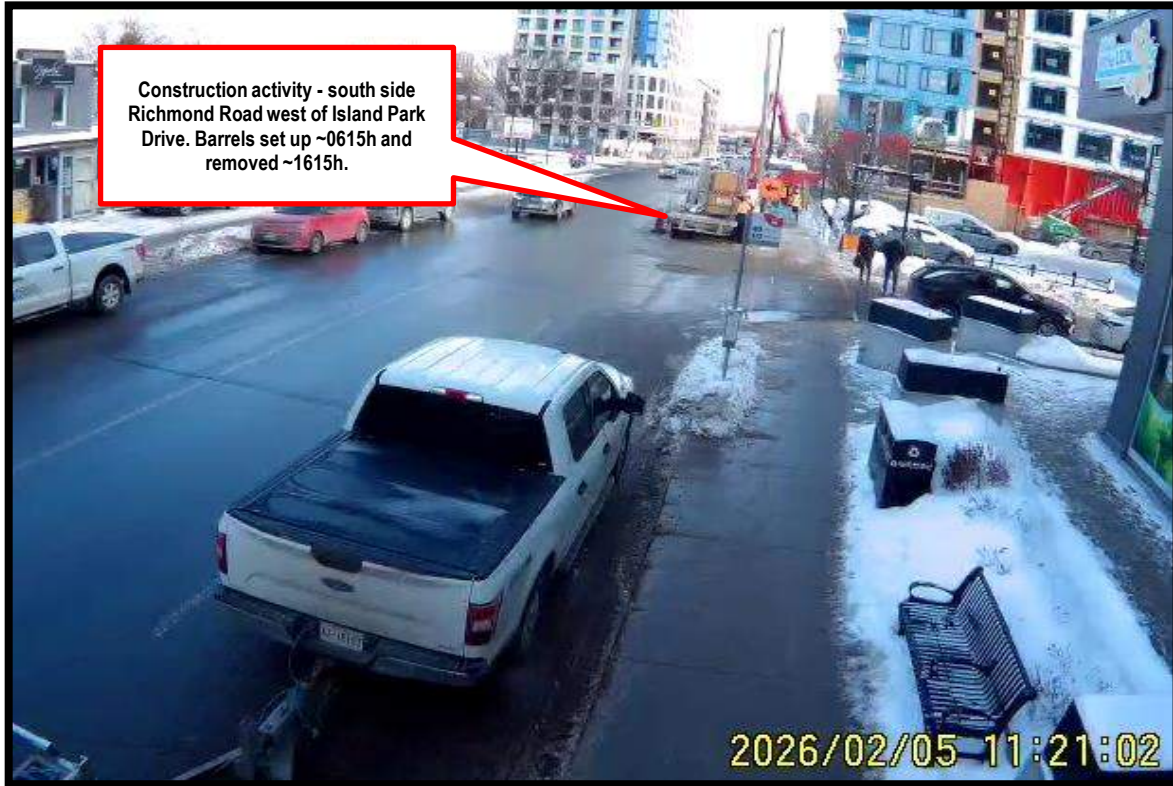
Turning Movement Count Data



Diagrams, Maps and Photographs

Leighton Terrace & Richmond Road

Thursday, February 05, 2026





Turning Movement Count

Summary Report Including Peak Hours, AADT and Expansion Factors

All Vehicles Except Bicycles and Personal E-Transportation



Leighton Terrace & Richmond Road Ottawa, ON

Survey Date: Thursday, February 05, 2026 **Start Time:** 0700 **AADT Factor:** 0.9
Weather AM: Mostly Clear -16° C **Survey Duration:** 8 Hrs. **Survey Hours:** 0700-1000, 1130-1330 & 1500-1800
Weather PM: Mostly Sunny -9° C **Surveyor(s):** J. Mousseau

Richmond Rd.

Richmond Rd.

Leighton Terr.

#81 Richmond Rd.

Eastbound

Westbound

Northbound

Southbound

Time Period	Richmond Rd. Eastbound					Richmond Rd. Westbound					Street Total	Leighton Terr. Northbound					Street Total	#81 Richmond Rd. Southbound					Street Total	Grand Total
	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot		LT	ST	RT	UT	N/B Tot		LT	ST	RT	UT	S/B Tot		
0700-0800	0	210	8	1	219	8	291	1	1	301	520	6	0	8	0	14	0	0	0	0	0	14	534	
0800-0900	0	292	7	0	299	10	334	1	0	345	644	6	0	10	1	17	1	0	0	0	1	18	662	
0900-1000	0	267	6	0	273	7	363	1	0	371	644	5	0	1	0	6	1	0	0	0	1	7	651	
1130-1230	2	306	10	1	319	7	369	3	0	379	698	6	0	15	0	21	0	1	2	0	3	24	722	
1230-1330	3	321	11	0	335	7	410	1	0	418	753	8	0	6	0	14	0	0	3	0	3	17	770	
1500-1600	0	334	7	0	341	6	501	4	0	511	852	7	0	4	0	11	0	0	1	0	1	12	864	
1600-1700	1	390	6	0	397	7	594	2	0	603	1000	6	1	7	0	14	1	0	0	0	1	15	1015	
1700-1800	3	393	12	3	411	5	587	2	0	594	1005	6	0	5	0	11	1	0	0	0	1	12	1017	
Totals	9	2513	67	5	2594	57	3449	15	1	3522	6116	50	1	56	1	108	4	1	6	0	11	119	6235	

Equivalent 12 & 24-hour Vehicle Volumes Including the Annual Average Daily Traffic (AADT) Factor Applicable to the Day and Month of the Turning Movement Count

Expansion factors are applied exclusively to standard weekday 8-hour turning movement counts conducted during the hours of 0700h - 1000h, 1130h - 1330h and 1500h - 1800h

Equivalent 12-hour vehicle volumes. These volumes are calculated by multiplying the 8-hour totals by the 8 → 12 expansion factor of 1.39

Equ. 12 Hr	13	3493	93	7	3606	79	4794	21	1	4896	8501	70	1	78	1	150	6	1	8	0	15	165	8667
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Average daily 12-hour vehicle volumes. These volumes are calculated by multiplying the equivalent 12-hour totals by the AADT factor of: 0.9

AADT 12-hr	11	3144	84	6	3245	71	4315	19	1	4406	7651	63	1	70	1	135	5	1	8	0	14	149	7800
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24-Hour AADT. These volumes are calculated by multiplying the average daily 12-hour vehicle volumes by the 12 → 24 expansion factor of 1.31

AADT 24 Hr	15	4118	110	8	4251	93	5652	25	2	5772	10023	82	2	92	2	177	7	2	10	0	18	195	10218
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AADT and expansion factors provided by the City of Ottawa

AM Peak Hour Factor → 0.88											Highest Hourly Vehicle Volume Between 0700h & 1000h												
AM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
0845-0945	0	286	5	0	291	8	380	1	0	389	680	4	0	4	0	8	1	0	0	0	1	9	689
OFF Peak Hour Factor → 0.95											Highest Hourly Vehicle Volume Between 1130h & 1330h												
OFF Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1230-1330	3	321	11	0	335	7	410	1	0	418	753	8	0	6	0	14	0	0	3	0	3	17	770
PM Peak Hour Factor → 0.95											Highest Hourly Vehicle Volume Between 1500h & 1800h												
PM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1630-1730	2	411	10	2	425	8	631	2	0	641	1066	6	1	5	0	12	0	0	0	0	0	12	1078

Comments:

OC Transpo & school buses comprise 42.60% of the heavy vehicle traffic. This location was counted as an offset 4-way together with the access to Napoli's Restaurant (#81). The E/B curb lane & sidewalk between Island Park Drive & Leighton Terrace were closed for construction between 0615 H & 1615 H. The pedestrian crossing totals include 263 crossings made by construction workers working on the tower on the S/W corner of Island Park Drive & Richmond Road.

Notes:

1. Includes all vehicle types except bicycles, electric bicycles, and electric scooters.
2. When expansion and AADT factors are applied, the results will differ slightly due to rounding.

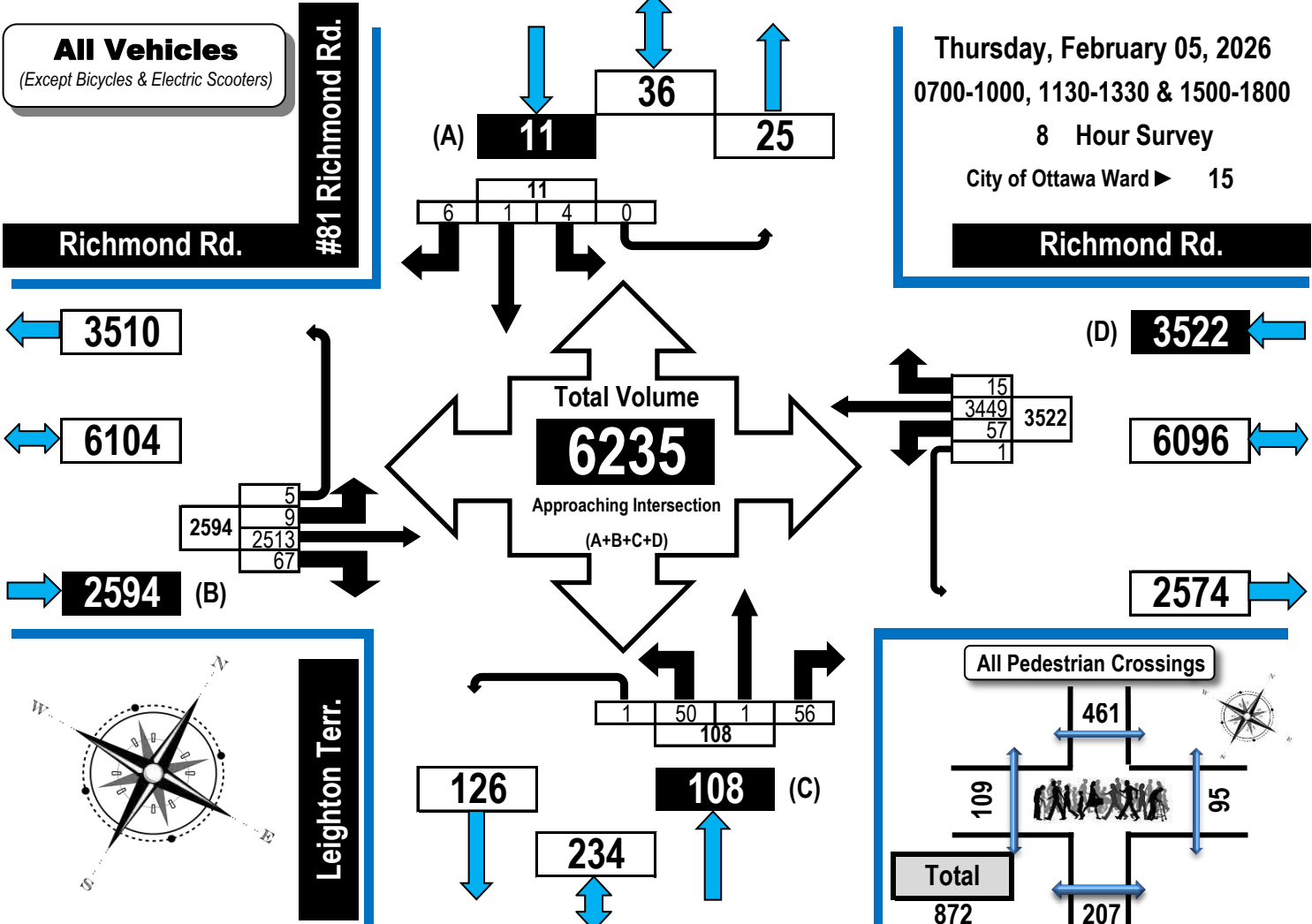


Turning Movement Count Summary, AM and PM Peak Hour Flow Diagrams

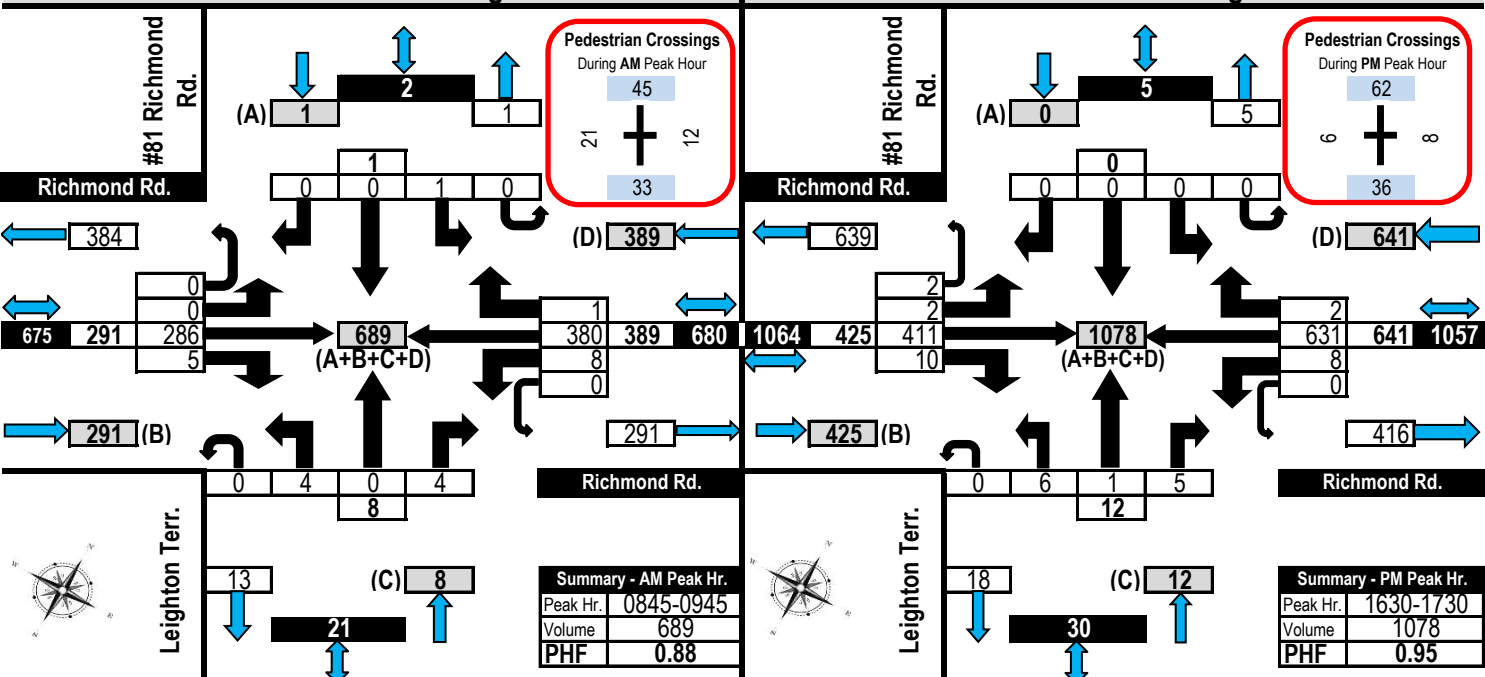


All Vehicles Except Bicycles and Personal E-Transportation

Leighton Terrace & Richmond Road Ottawa, ON



AM Peak Hour Flow Diagram PM Peak Hour Flow Diagram





Turning Movement Count

Summary, OFF and EVENING Peak Hour

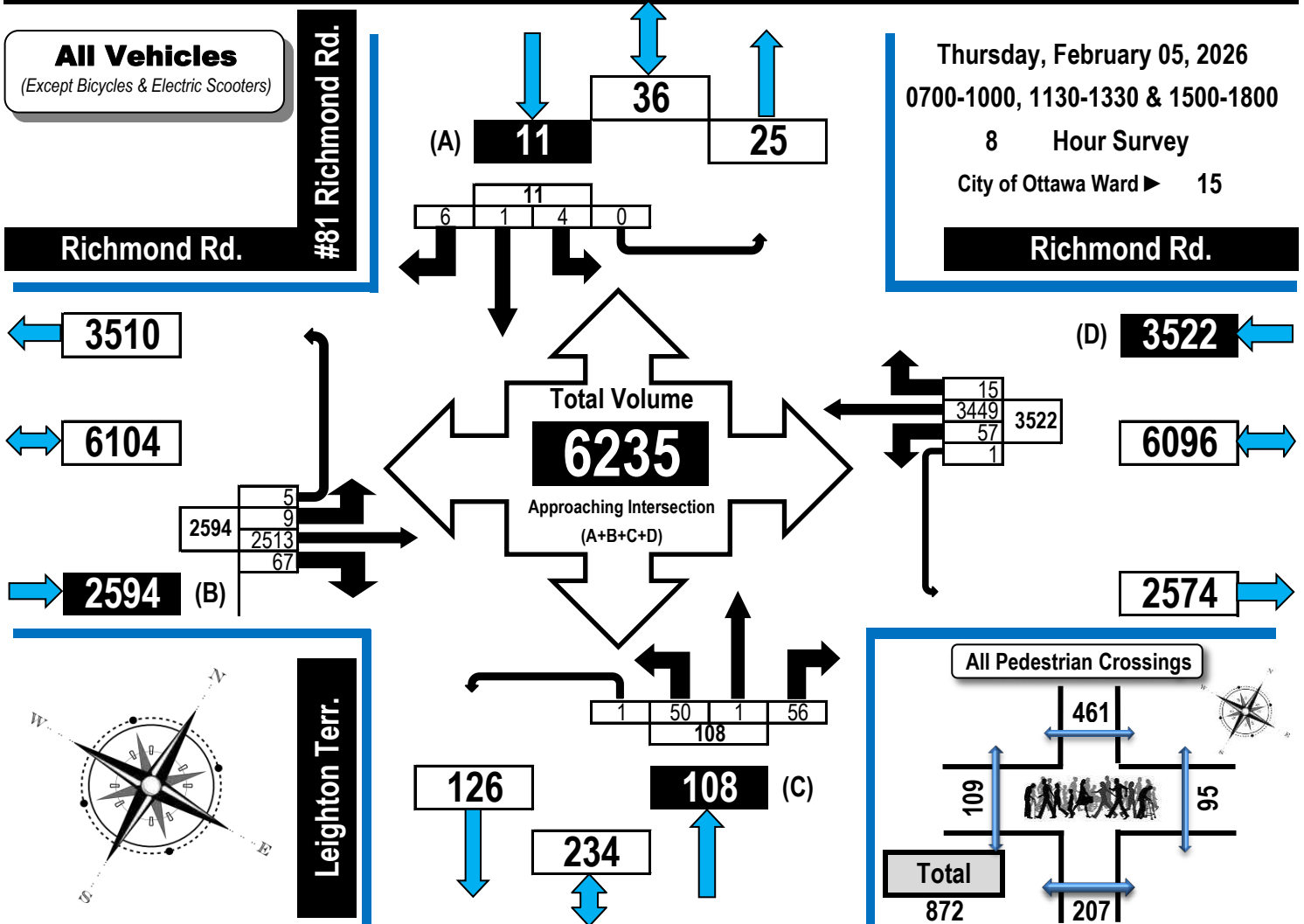
Flow Diagrams



All Vehicles Except Bicycles and Personal E-Transportation

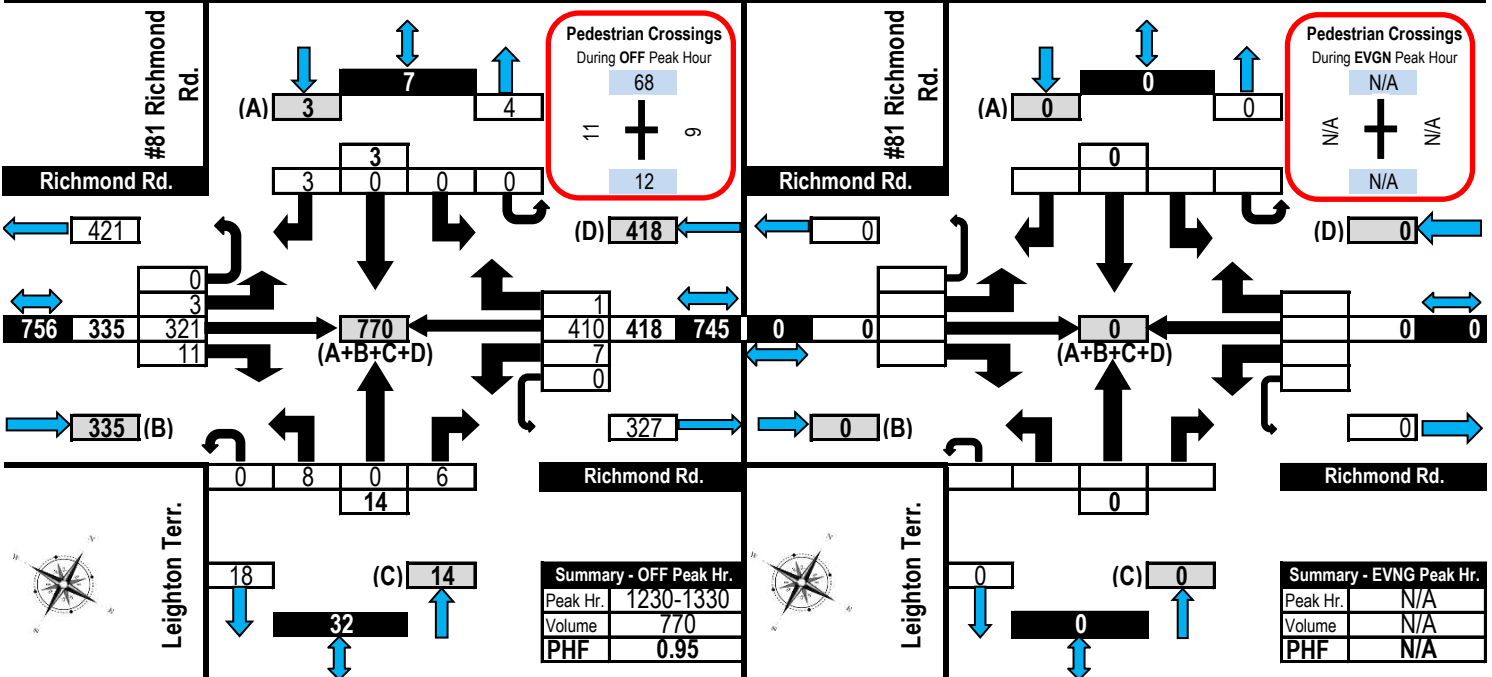
Leighton Terrace & Richmond Road

Ottawa, ON



Off Peak Hour Flow Diagram

Evening Peak Hour Flow Diagram

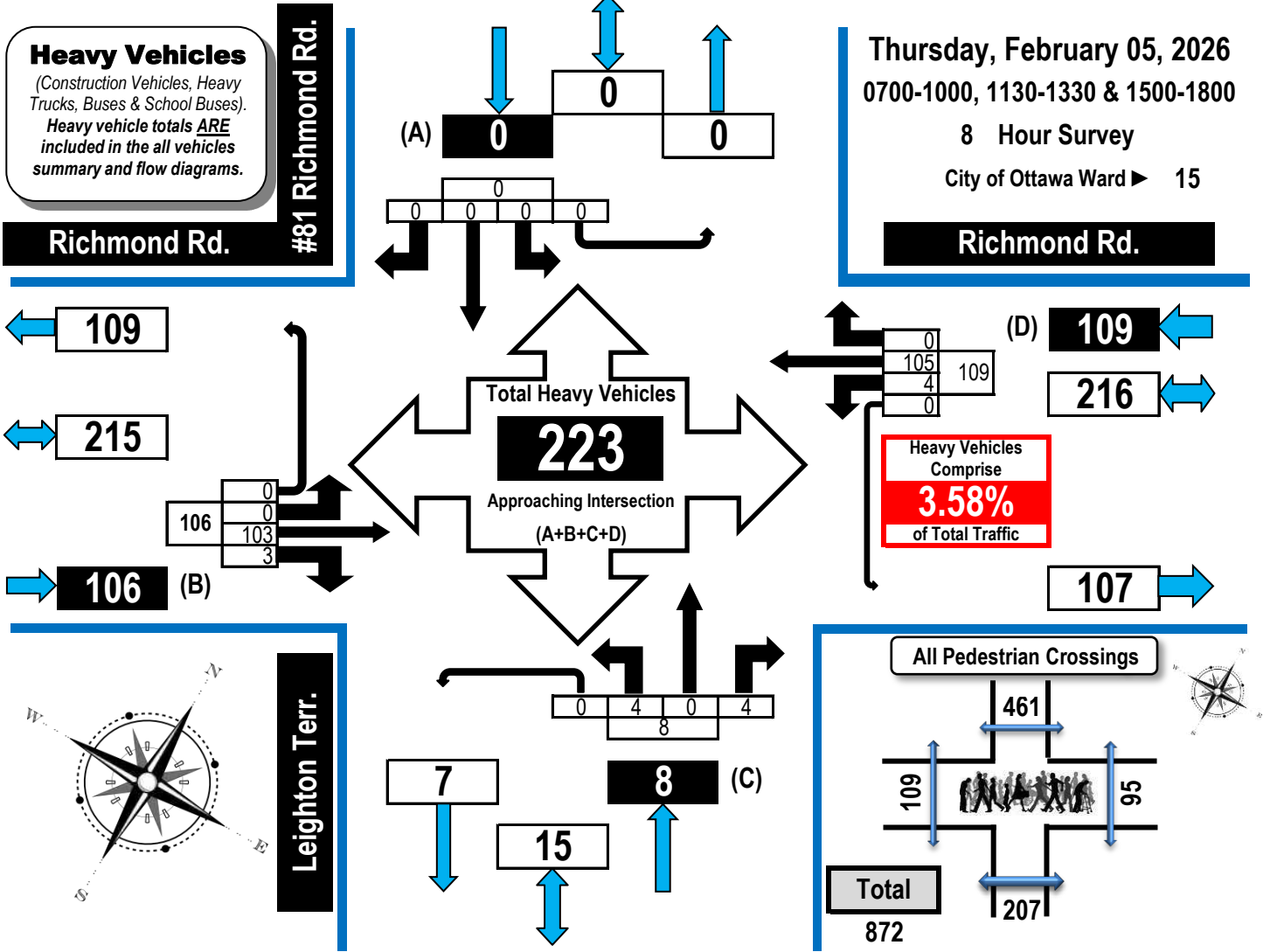




Turning Movement Count Heavy Vehicle Summary (FHWA Class 4-13) Flow Diagram



Leighton Terrace & Richmond Road Ottawa, ON



Richmond Rd. Eastbound	Richmond Rd. Westbound	Leighton Terr. Northbound	#81 Richmond Rd. Southbound
------------------------	------------------------	---------------------------	-----------------------------

Time Period	Richmond Rd. Eastbound					Richmond Rd. Westbound					Leighton Terr. Northbound					#81 Richmond Rd. Southbound					GR Tot
	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	
0700-0800	0	11	0	0	11	0	9	0	0	9	1	0	0	0	1	0	0	0	0	0	21
0800-0900	0	17	1	0	18	0	15	0	0	15	0	0	1	0	1	0	0	0	0	0	34
0900-1000	0	16	0	0	16	3	20	0	0	23	2	0	0	0	2	0	0	0	0	0	41
1130-1230	0	14	1	0	15	0	21	0	0	21	0	0	2	0	2	0	0	0	0	0	38
1230-1330	0	12	0	0	12	1	10	0	0	11	1	0	0	0	1	0	0	0	0	0	24
1500-1600	0	17	0	0	17	0	11	0	0	11	0	0	0	0	0	0	0	0	0	0	28
1600-1700	0	7	1	0	8	0	12	0	0	12	0	0	1	0	1	0	0	0	0	0	21
1700-1800	0	9	0	0	9	0	7	0	0	7	0	0	0	0	0	0	0	0	0	0	16
Totals	0	103	3	0	106	4	105	0	0	109	4	0	4	0	8	0	0	0	0	0	223

Comments:

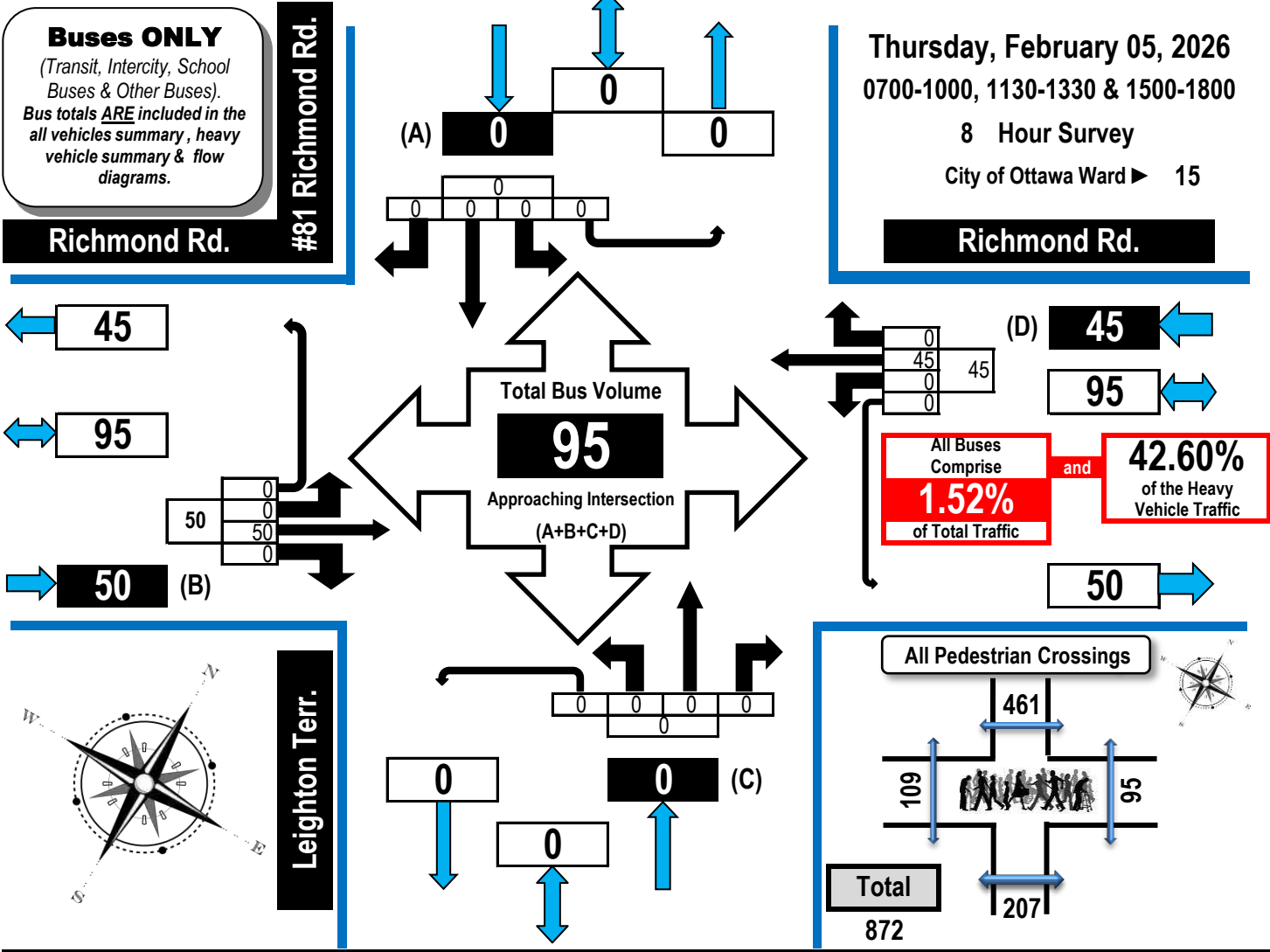
OC Transpo & school buses comprise 42.60% of the heavy vehicle traffic. This location was counted as an offset 4-way together with the access to Napoli's Restaurant (#81). The E/B curb lane & sidewalk between Island Park Drive & Leighton Terrace were closed for construction between 0615 H & 1615 H. The pedestrian crossing totals include 263 crossings made by construction workers working on the tower on the S/W corner of Island Park Drive & Richmond Road.



Turning Movement Count All Buses Summary (FHWA Class 4 ONLY) Flow Diagram



Leighton Terrace & Richmond Road Ottawa, ON



Time Period	Richmond Rd. Eastbound				EB Tot	Richmond Rd. Westbound				WB Tot	Leighton Terr. Northbound				NB Tot	#81 Richmond Rd. Southbound				SB Tot	GR Tot	
	LT	ST	RT	UT		LT	ST	RT	UT		LT	ST	RT	UT		LT	ST	RT	UT			
0700-0800	0	4	0	0	4	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	9
0800-0900	0	6	0	0	6	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	12
0900-1000	0	6	0	0	6	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	12
1130-1230	0	6	0	0	6	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	12
1230-1330	0	6	0	0	6	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	12
1500-1600	0	10	0	0	10	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	14
1600-1700	0	5	0	0	5	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	11
1700-1800	0	7	0	0	7	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	13
Totals	0	50	0	0	50	0	45	0	0	45	0	0	0	0	0	0	0	0	0	0	0	95

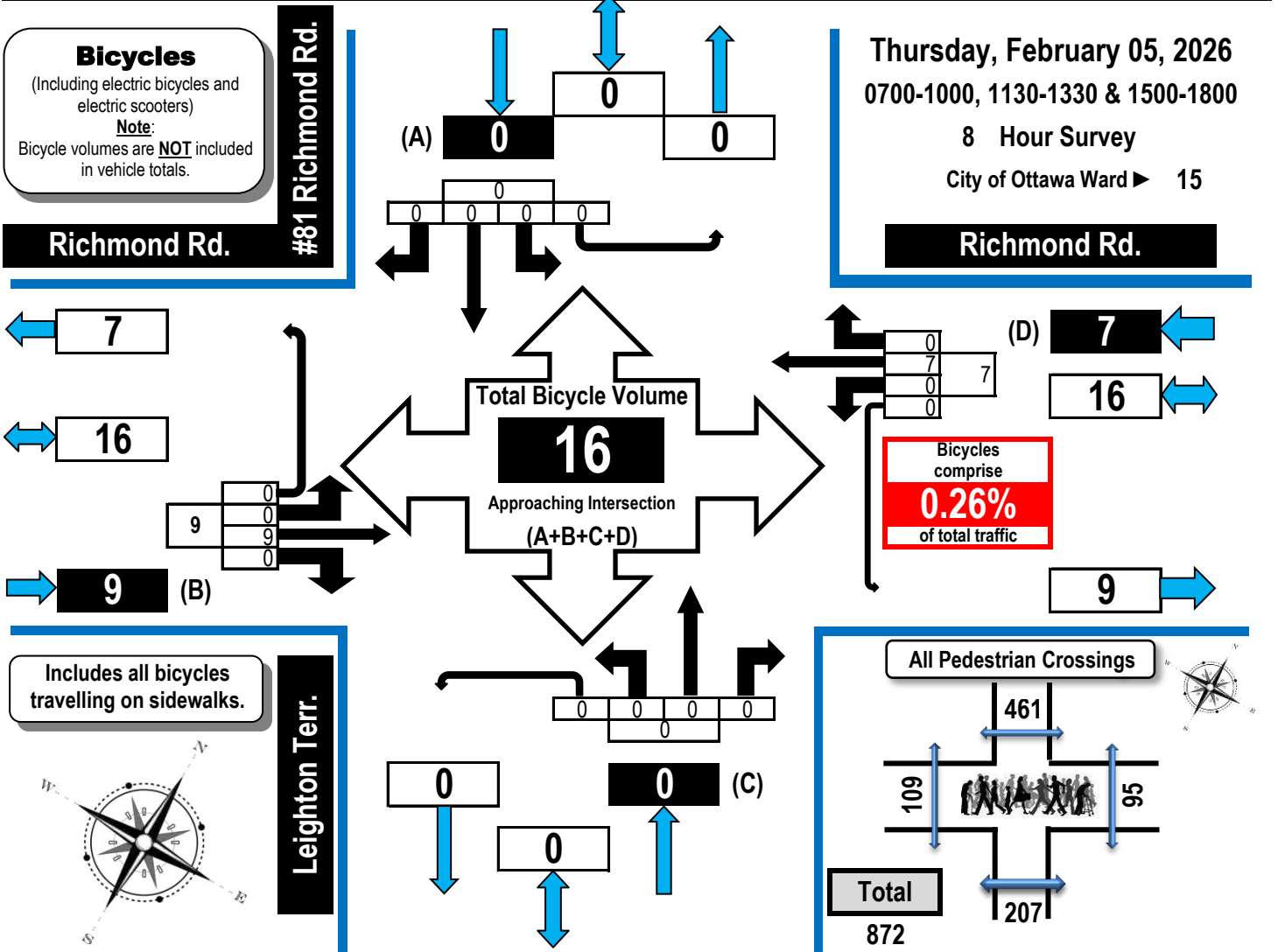
Comments:
 OC Transpo & school buses comprise 42.60% of the heavy vehicle traffic. This location was counted as an offset 4-way together with the access to Napoli's Restaurant (#81). The E/B curb lane & sidewalk between Island Park Drive & Leighton Terrace were closed for construction between 0615 H & 1615 H. The pedestrian crossing totals include 263 crossings made by construction workers working on the tower on the S/W corner of Island Park Drive & Richmond Road.



Turning Movement Count Bicycles and Personal E-Transportation Summary Flow Diagram



Leighton Terrace & Richmond Road Ottawa, ON



Time Period	Richmond Rd. Eastbound					Richmond Rd. Westbound					Leighton Terr. Northbound					#81 Richmond Rd. Southbound					GR Tot
	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	
0700-0800	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
0800-0900	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
0900-1000	0	1	0	0	1	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	3
1130-1230	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1230-1330	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500-1600	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1600-1700	0	2	0	0	2	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	5
1700-1800	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Totals	0	9	0	0	9	0	7	0	0	7	0	0	0	0	0	0	0	0	0	0	16

Comments:

OC Transpo & school buses comprise 42.60% of the heavy vehicle traffic. This location was counted as an offset 4-way together with the access to Napoli's Restaurant (#81). The E/B curb lane & sidewalk between Island Park Drive & Leighton Terrace were closed for construction between 0615 H & 1615 H. The pedestrian crossing totals include 263 crossings made by construction workers working on the tower on the S/W corner of Island Park Drive & Richmond Road.



Turning Movement Count Pedestrian Crossings Summary and Flow Diagram



Leighton Terrace & Richmond Road

Ottawa, ON

Pedestrian Crossings

Thursday, February 05, 2026

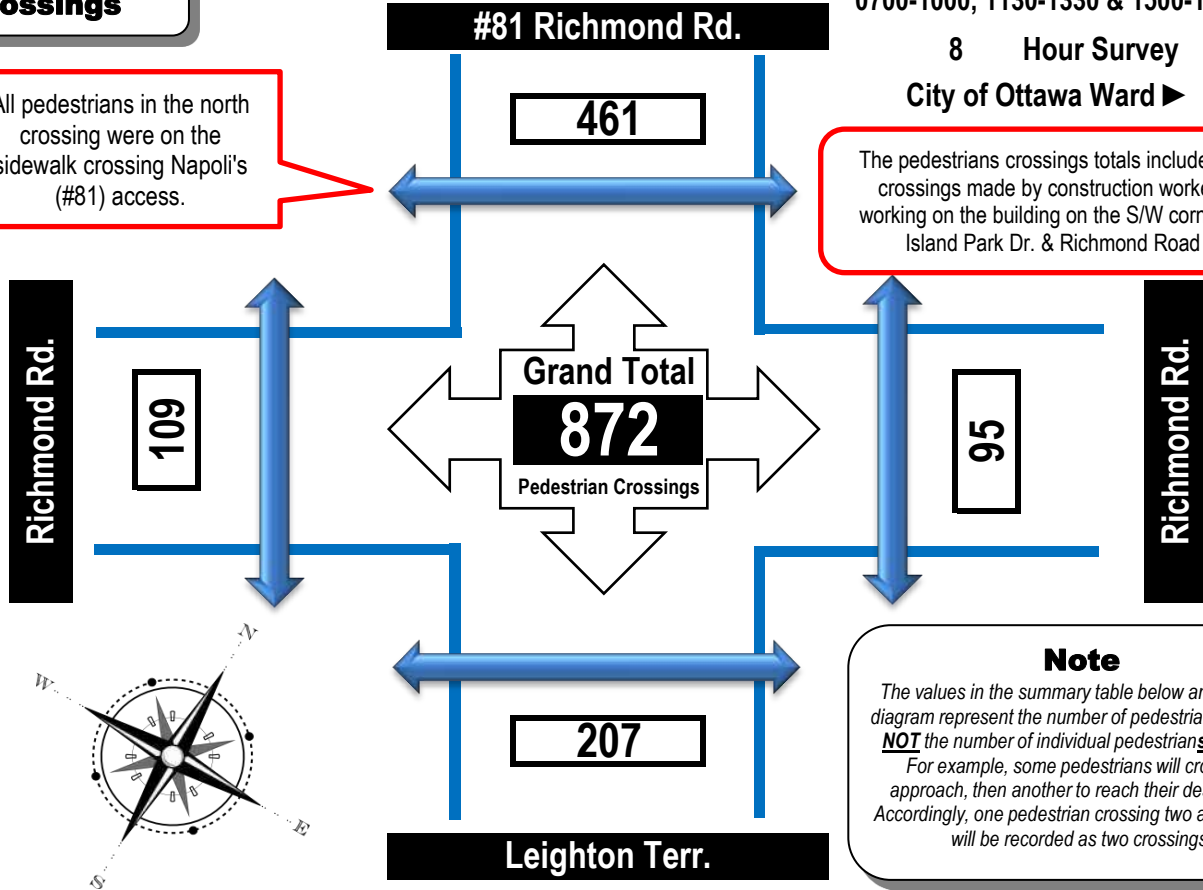
0700-1000, 1130-1330 & 1500-1800

8 Hour Survey

City of Ottawa Ward 15

All pedestrians in the north crossing were on the sidewalk crossing Napoli's (#81) access.

The pedestrians crossings totals include 263 crossings made by construction workers working on the building on the S/W corner of Island Park Dr. & Richmond Road



Note
The values in the summary table below and the flow diagram represent the number of pedestrian crossings **NOT** the number of individual pedestrians crossing. For example, some pedestrians will cross one approach, then another to reach their destination. Accordingly, one pedestrian crossing two approaches will be recorded as two crossings.

Time Period	West Side Crossing Richmond Rd.	East Side Crossing Richmond Rd.	Street Total	South Side Crossing Leighton Terr.	North Side Crossing #81 Richmond Rd.	Street Total	Grand Total
0700-0800	24	12	36	24	36	60	96
0800-0900	14	6	20	18	47	65	85
0900-1000	23	12	35	33	52	85	120
1130-1230	12	26	38	16	66	82	120
1230-1330	11	9	20	12	68	80	100
1500-1600	14	14	28	31	65	96	124
1600-1700	9	16	25	32	68	100	125
1700-1800	2	0	2	41	59	100	102
Totals	109	95	204	207	461	668	872

Comments:

OC Transpo & school buses comprise 42.60% of the heavy vehicle traffic. This location was counted as an offset 4-way together with the access to Napoli's Restaurant (#81). The E/B curb lane & sidewalk between Island Park Drive & Leighton Terrace were closed for construction between 0615 H & 1615 H. The pedestrian crossing totals include 263 crossings made by construction workers working on the tower on the S/W corner of Island Park Drive & Richmond Road.

Attachment 4

Synchro Intersection Worksheets – Existing Conditions

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	286	5	8	380	1	4	0	4	1	0	0
Future Vol, veh/h	0	286	5	8	380	1	4	0	4	1	0	0
Conflicting Peds, #/hr	45	0	33	33	0	45	21	0	12	12	0	21
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	6	2	38	5	2	50	2	2	2	2	2
Mvmt Flow	0	318	6	9	422	1	4	0	4	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	468	0	0	357	0	0	604	840	207	657	843	278
Stage 1	-	-	-	-	-	-	354	354	-	486	486	-
Stage 2	-	-	-	-	-	-	250	486	-	171	357	-
Critical Hdwy	4.14	-	-	4.86	-	-	8.5	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	7.5	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.5	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.58	-	-	4	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1090	-	-	977	-	-	297	300	799	350	299	719
Stage 1	-	-	-	-	-	-	521	629	-	531	549	-
Stage 2	-	-	-	-	-	-	612	549	-	814	627	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1052	-	-	952	-	-	282	279	771	330	278	683
Mov Cap-2 Maneuver	-	-	-	-	-	-	282	279	-	330	278	-
Stage 1	-	-	-	-	-	-	507	613	-	512	523	-
Stage 2	-	-	-	-	-	-	595	523	-	802	611	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.3			13.9			15.9		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	413	1052	-	-	952	-	-	330
HCM Lane V/C Ratio	0.022	-	-	-	0.009	-	-	0.003
HCM Control Delay (s)	13.9	0	-	-	8.8	0.1	-	15.9
HCM Lane LOS	B	A	-	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	4	411	10	8	631	2	6	1	5	0	0	0
Future Vol, veh/h	4	411	10	8	631	2	6	1	5	0	0	0
Conflicting Peds, #/hr	62	0	36	36	0	62	6	0	8	8	0	6
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	10	2	2	2	2	2	20	2	2	2
Mvmt Flow	4	457	11	9	701	2	7	1	6	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	765	0	0	504	0	0	882	1290	278	1027	1294	420
Stage 1	-	-	-	-	-	-	507	507	-	782	782	-
Stage 2	-	-	-	-	-	-	375	783	-	245	512	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	7.3	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.5	3.52	4.02	3.32
Pot Cap-1 Maneuver	844	-	-	1057	-	-	241	162	668	189	161	582
Stage 1	-	-	-	-	-	-	516	538	-	353	403	-
Stage 2	-	-	-	-	-	-	618	403	-	737	535	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	803	-	-	1027	-	-	229	147	645	174	146	551
Mov Cap-2 Maneuver	-	-	-	-	-	-	229	147	-	174	146	-
Stage 1	-	-	-	-	-	-	498	519	-	334	378	-
Stage 2	-	-	-	-	-	-	607	378	-	719	516	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.2			17.8			0		
HCM LOS							C			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	294	803	-	-	1027	-	-	-
HCM Lane V/C Ratio	0.045	0.006	-	-	0.009	-	-	-
HCM Control Delay (s)	17.8	9.5	0	-	8.5	0.1	-	0
HCM Lane LOS	C	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	-

Attachment 5

Signal Warrant Calculation Sheets

Input Data Sheet

[Analysis Sheet](#)

[Results Sheet](#)

[Proposed Collision](#)

GO TO Justification:

What are the intersecting roadways?

Richmond Street / Leighton Terrace

What is the direction of the Main Road street?

East-West

When was the data collected?

2026-02-05

Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road?

2 or more

b.- Number of lanes on the Minor Road?

1

c.- How many approaches?

4

d.- What is the operating environment?

Urban

Population >= 10,000

AND

Speed < 70 km/hr

e.- What is the eight hour vehicle volume at the intersection? (Please fill in table below)

Hour Ending	Main Eastbound Approach			Minor Northbound Approach			Main Westbound Approach			Minor Southbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:00	0	210	8	6	0	8	8	291	1	0	0	0	
8:00	0	292	7	6	0	10	10	334	1	1	0	0	
9:00	0	267	6	5	0	1	7	363	1	1	0	0	
11:30	2	306	10	6	0	15	7	369	3	0	1	2	
12:30	3	321	11	8	0	6	7	410	1	0	0	3	
15:00	0	334	7	7	0	4	6	501	4	0	0	1	
16:00	1	390	6	6	1	7	7	594	2	1	0	0	
17:00	3	393	12	6	0	5	5	587	2	1	0	0	
Total	9	2,513	67	50	1	56	57	3,449	15	4	1	6	0

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent				
	1 Lanes		2 or More Lanes		Hour Ending													
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW	7:00	8:00	9:00	11:30	12:30	15:00	16:00	17:00						
1A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	480	720	600	900	532	661	651	721	770	864	1,015	1,014	667	83
	COMPLIANCE %				59	73	72	80	86	96	100	100						
1B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	120	170	120	170	14	17	7	24	17	12	15	12	69	9
	COMPLIANCE %				8	10	4	14	10	7	9	7						
Restricted Flow Signal Justification 1:					Both 1A and 1B 100% Fulfilled each of 8 hours Lesser of 1A or 1B at least 80% fulfilled each of 8 hours								Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent				
	1 lanes		2 or More lanes		Hour Ending													
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW	7:00	8:00	9:00	11:30	12:30	15:00	16:00	17:00						
2A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	480	720	600	900	518	644	644	697	753	852	1,000	1,002	656	82
	COMPLIANCE %				58	72	72	77	84	95	100	100						
2B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	50	75	50	75	6	7	6	7	8	7	8	7	75	9
	COMPLIANCE %				8	9	8	9	11	9	11	9						
Restricted Flow Signal Justification 2:					Both 2A and 2B 100% fulfilled each of 8 hours Lesser of 2A or 2B at least 80% fulfilled each of 8 hours								Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		

Justification 3: Combination

Combination Justification 1 and 2

Justification	Justification Satisfied 80% or More	Two Justifications Satisfied 80% or More	
		YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
Justification 1	Minimum Vehicle Volume	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
Justification 2	Delay Cross Traffic	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
		NOT JUSTIFIED	

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	12:30	753	14	300	5 %	5 %
	15:00	852	11	253	4 %	
	16:00	1,000	14	194	7 %	
	17:00	1,002	11	194	6 %	

Results Sheet

[Input Sheet](#)[Analysis Sheet](#)[Proposed Collision](#)[GO TO Justification:](#)

Intersection: Richmond Street / Leighton Terrace

Count Date: 2026-02-05

Summary Results

	Justification	Compliance	Signal Justified?	
			YES	NO
1. Minimum Vehicular Volume	A Total Volume	83 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Crossing Volume	9 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Delay to Cross Traffic	A Main Road	82 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Crossing Road	9 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Combination	A Justificaton 1	9 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Justification 2	9 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. 4-Hr Volume		5 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Richmond Road @ Leighton Terrace
2030 Future Background

Justification #7

Justification	Description	Minimum Requirement		Minimum Requirement		Compliance		Entire %	Signal
		1 Lane Highway		2 or More Lanes		Sectional			
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	454	50%	3%	No
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	5	3%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	449	50%	4%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	3	4%		

Notes

1. Refer to OTM Book 12, pg 92, Mar 2012
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, $AHV = PM/2$ or $(AM + PM) / 4$, including amplification factors
4. T-intersection factor corrected, applies only to 1B
5. Correction to 2B, as per MTO and City of Ottawa, for '2 or More Lanes' has been applied

Richmond Road @ Leighton Terrace
2030 Future Total

Justification #7

Justification	Description	Minimum Requirement		Minimum Requirement		Compliance		Entire %	Signal
		1 Lane Highway		2 or More Lanes		Sectional			
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	472	52%	9%	No
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	16	9%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	457	51%	9%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	7	9%		

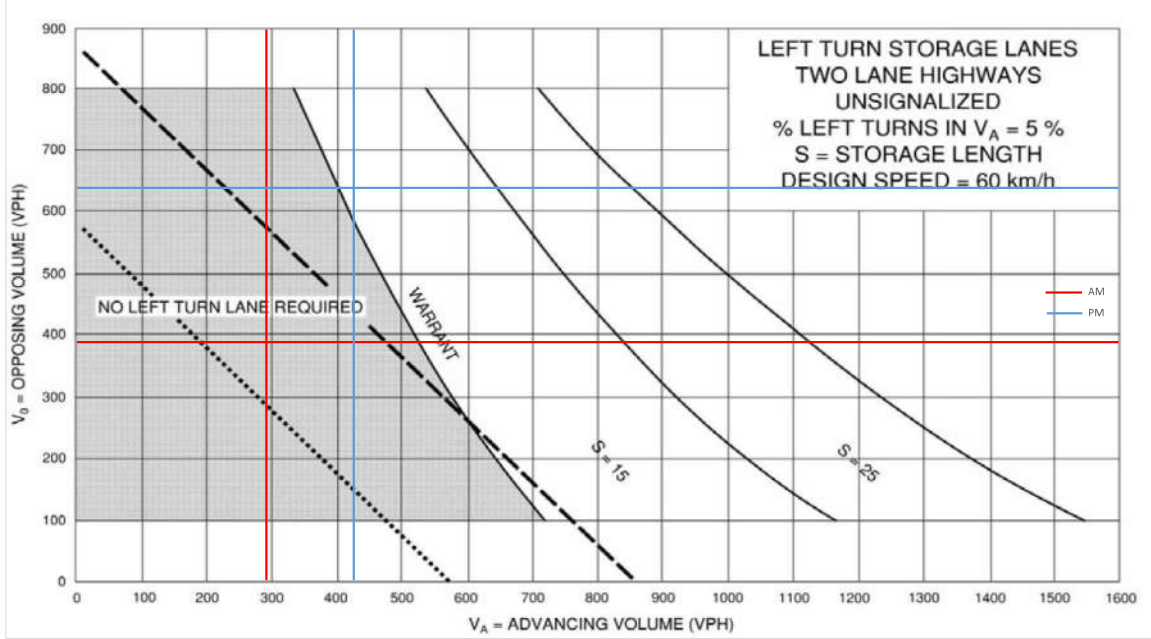
Notes

1. Refer to OTM Book 12, pg 92, Mar 2012
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, $AHV = PM/2$ or $(AM + PM) / 4$, including amplification factors
4. T-intersection factor corrected, applies only to 1B
5. Correction to 2B, as per MTO and City of Ottawa, for '2 or More Lanes' has been applied

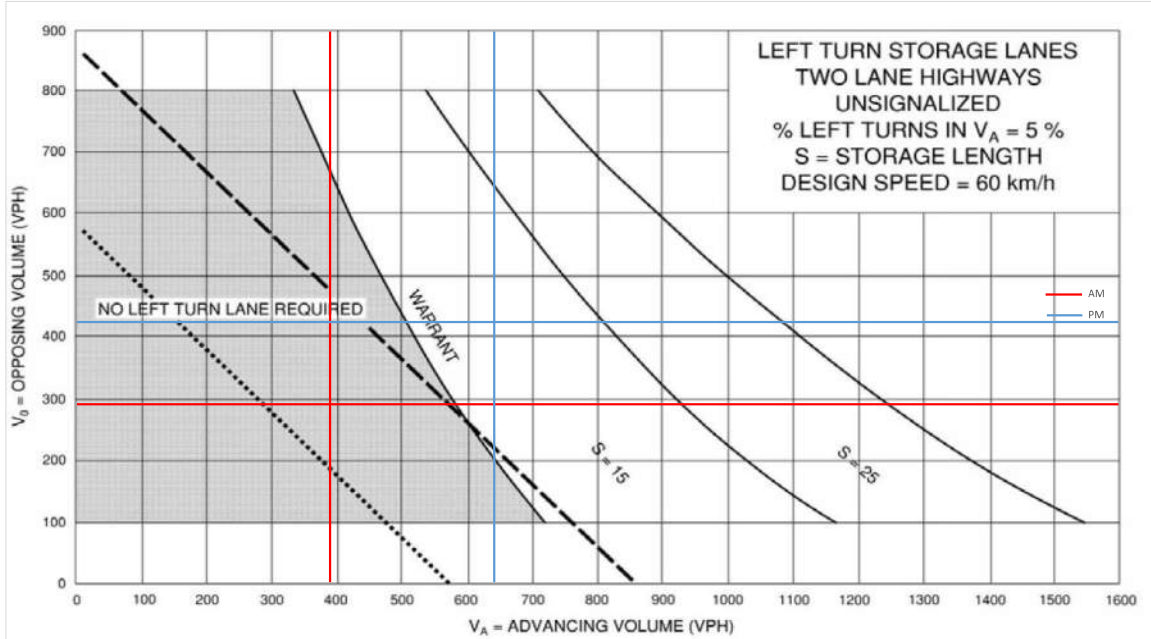
Attachment 6

Left-Turn Lane Warrant Calculation Sheets

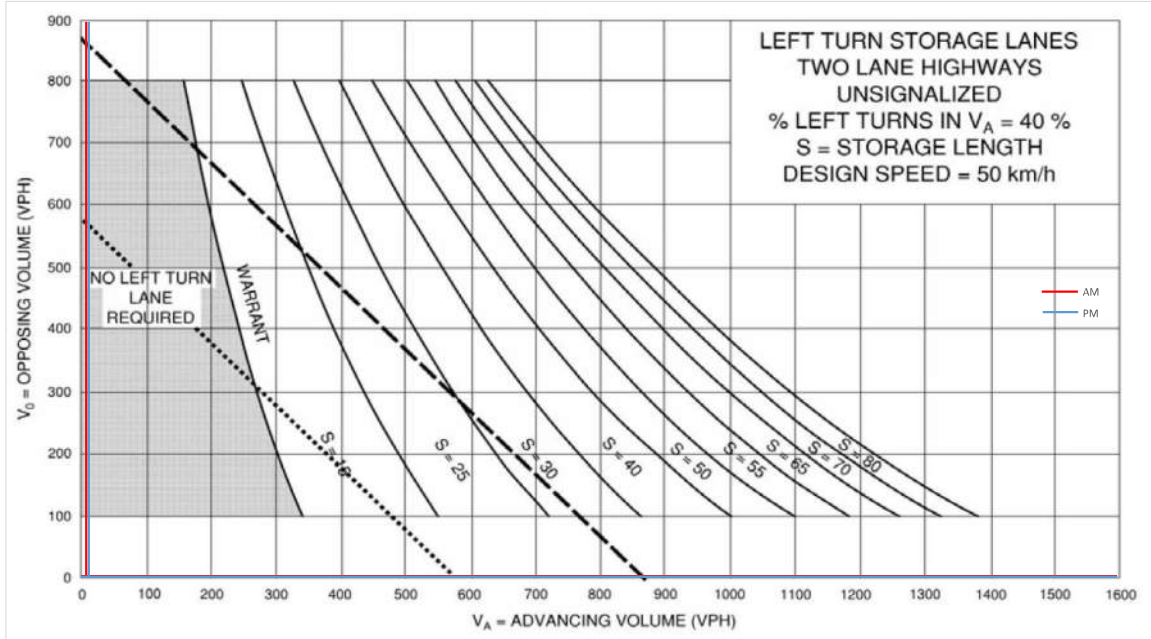
Existing - Eastbound Left



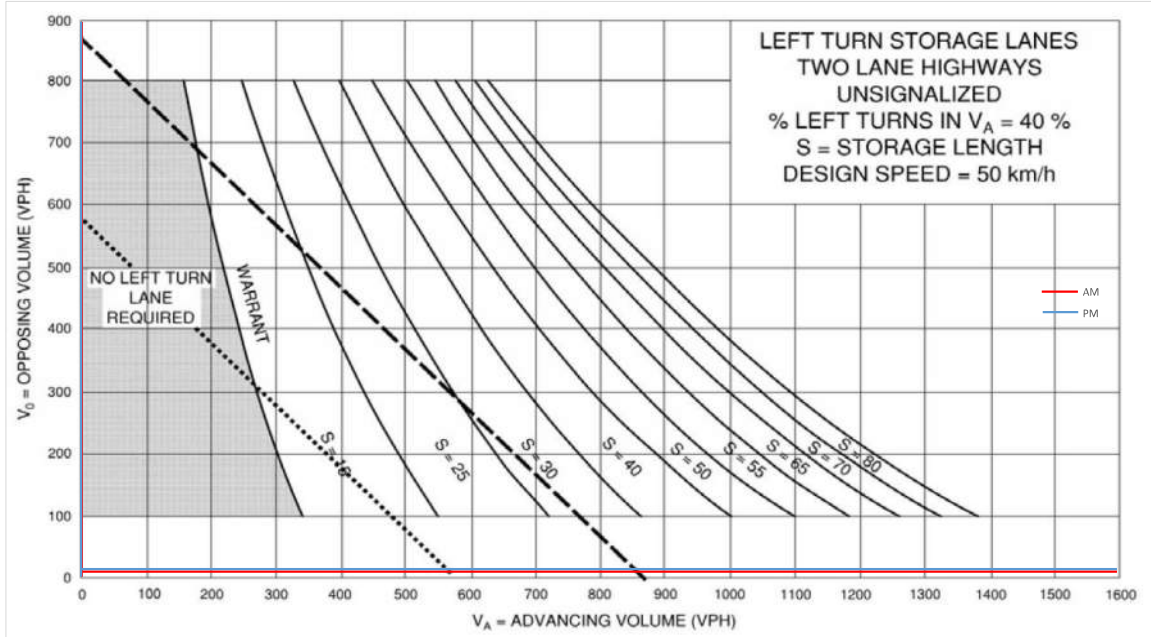
Existing - Westbound Left

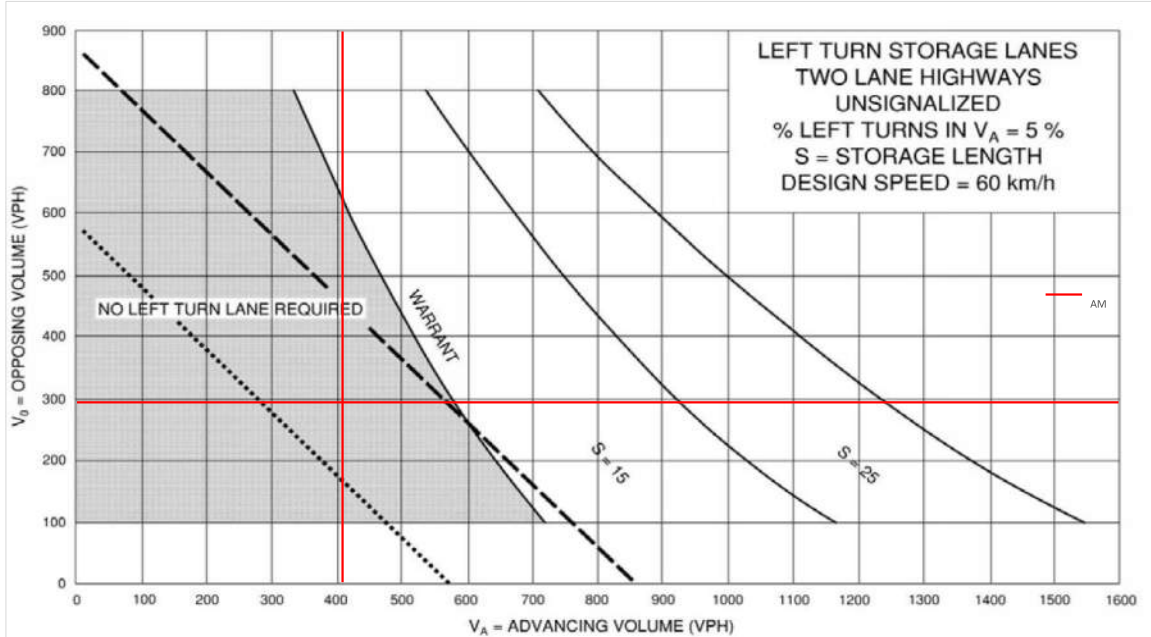
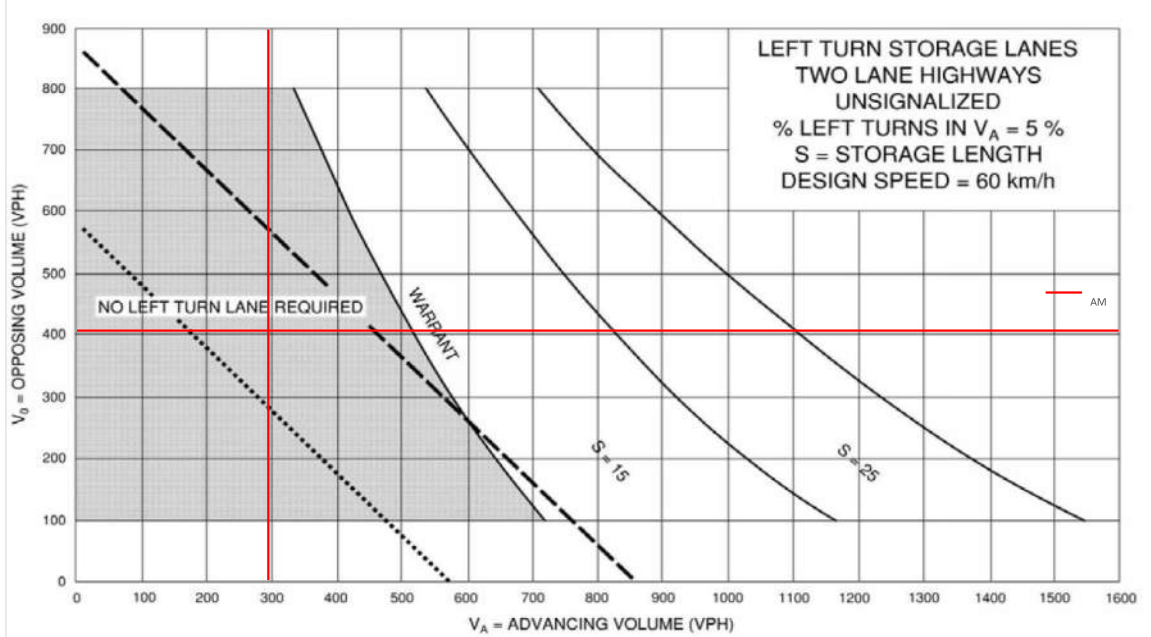


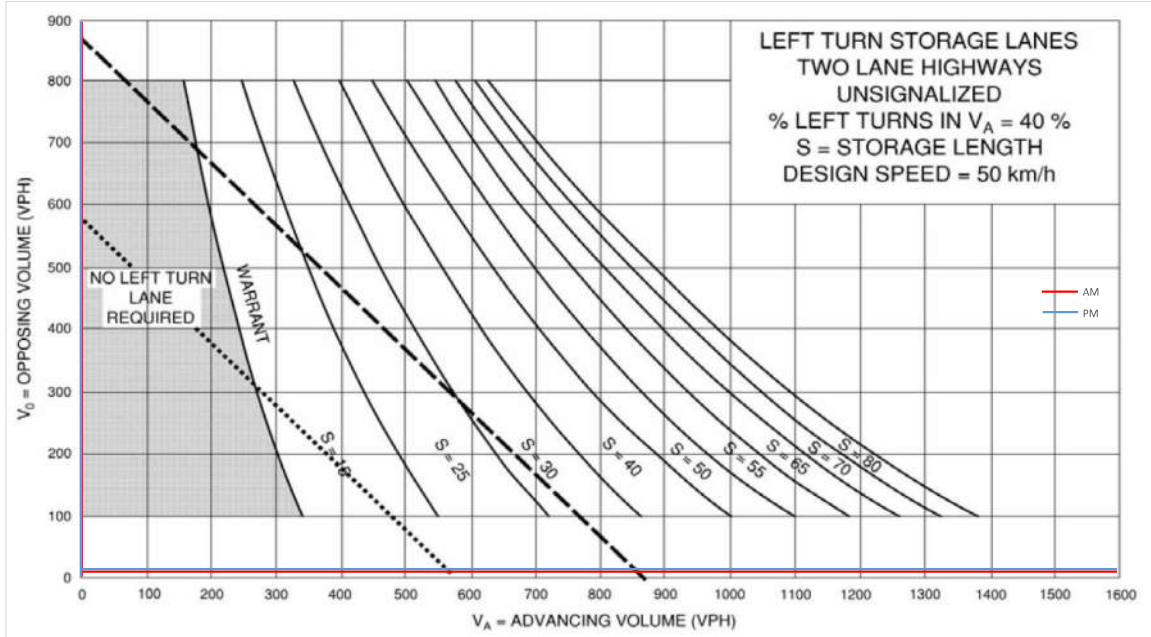
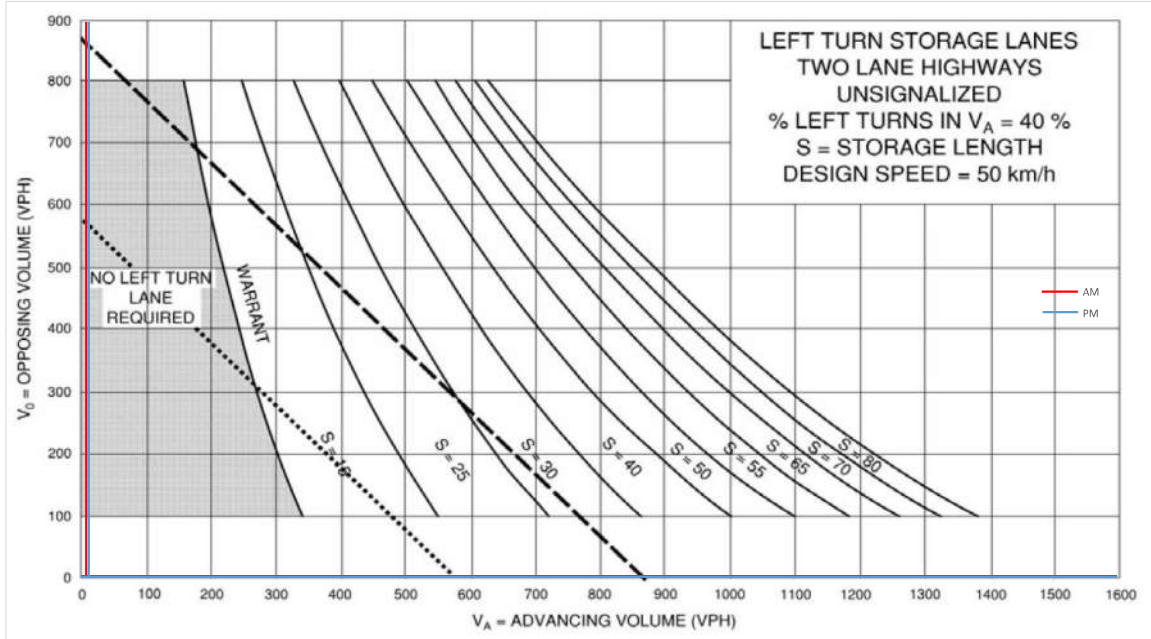
Existing - Northbound Left



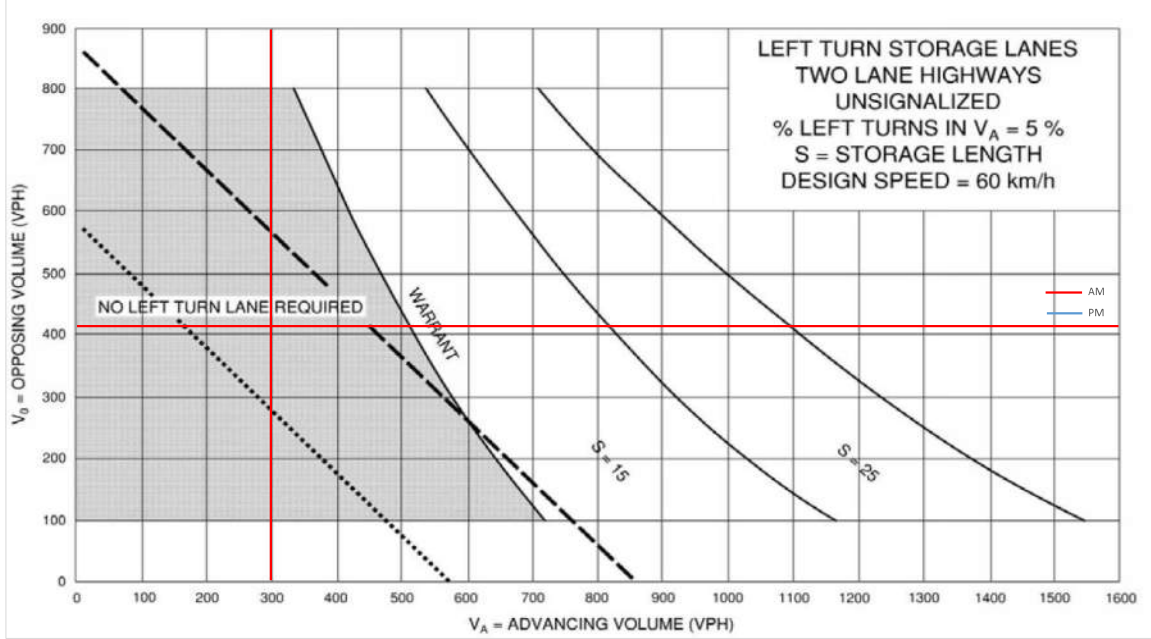
Existing - Southbound Left



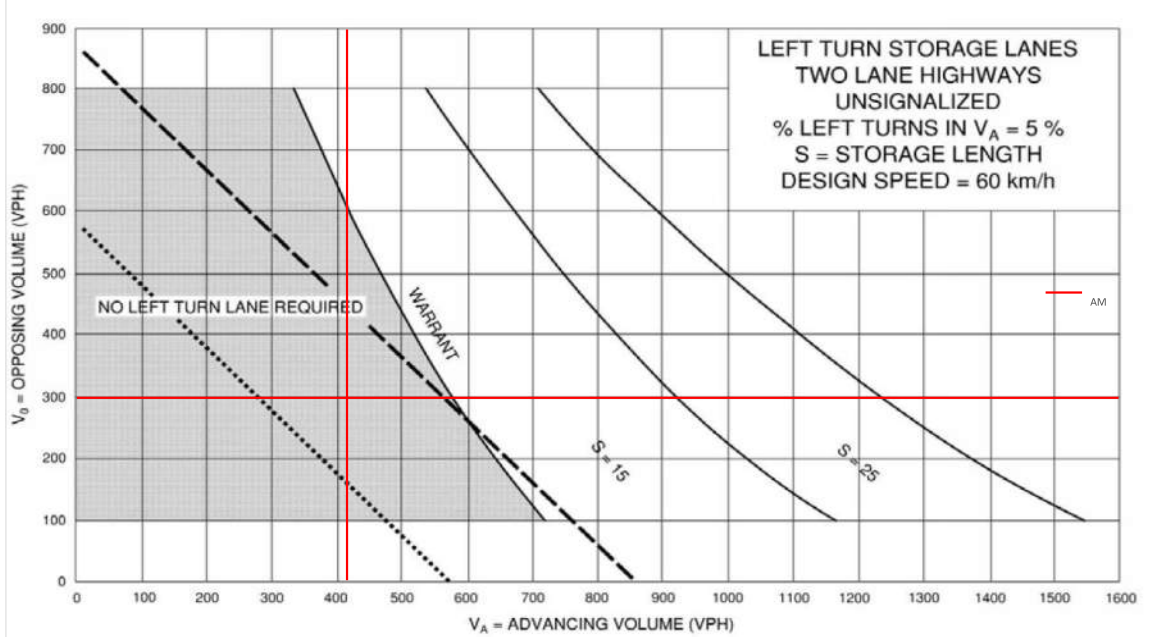




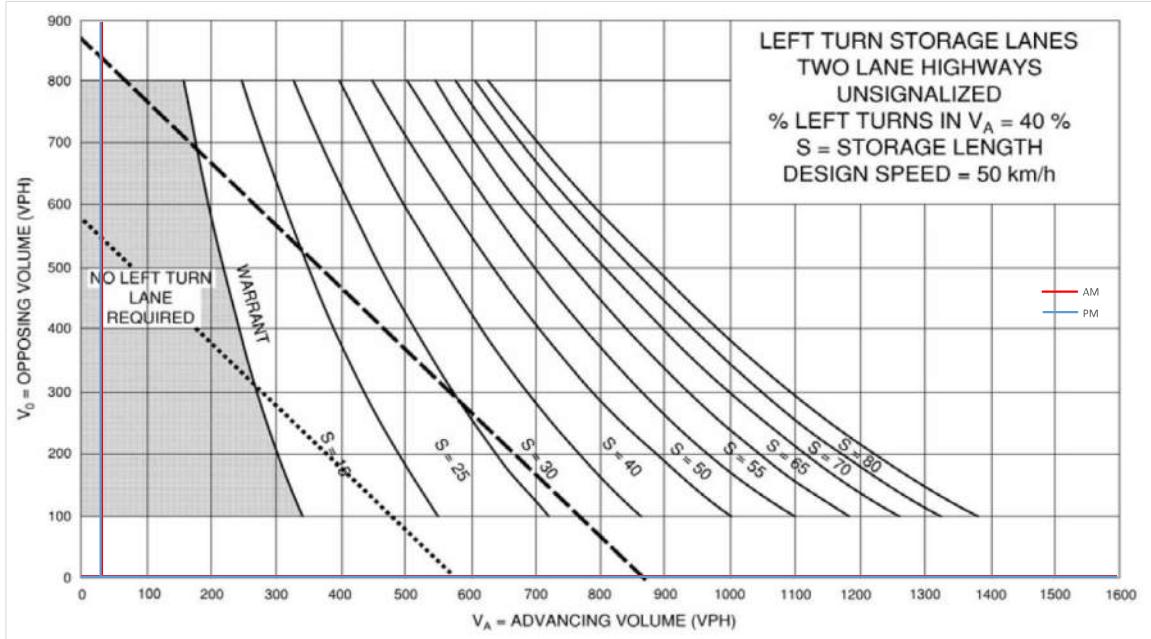
Future Total 2030 - Eastbound Left



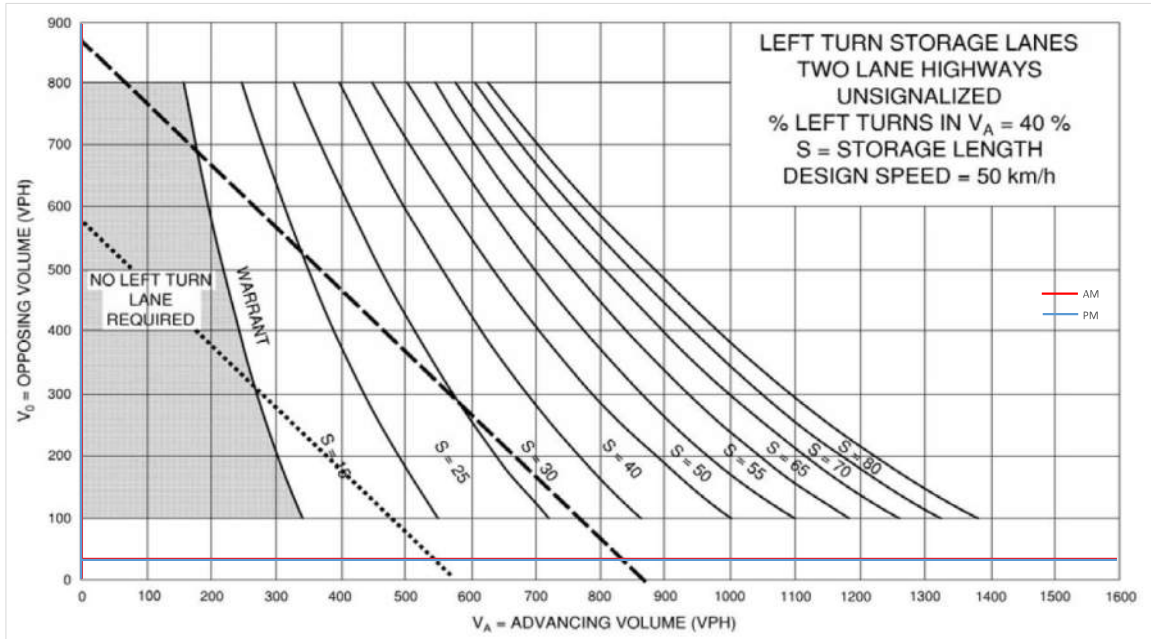
Future Total 2030 - Westbound Left



Future Total 2030 - Northbound Left



Future Total 2030 - Southbound Left



Attachment 7

TRANS Model Plots

TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

Richmond Road Area Growth

2011 Model - Basecase

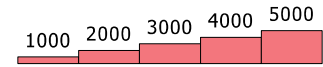
N/A

User Initials: TIMW
Plot Prepared: August 10, 2020
EMME Scenario: 21711

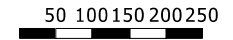


Legend

AM Peak Hour Total Traffic Volume



Distance (m)



The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.

Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena and has been calibrated at a regional level.

As a general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.

TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume Richmond Road Area Growth

2031 Model - Basecase

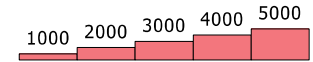
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User Initials: TIMW
Plot Prepared: August 10, 2020
EMME Scenario: 21711

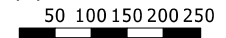


Legend

AM Peak Hour Total Traffic Volume



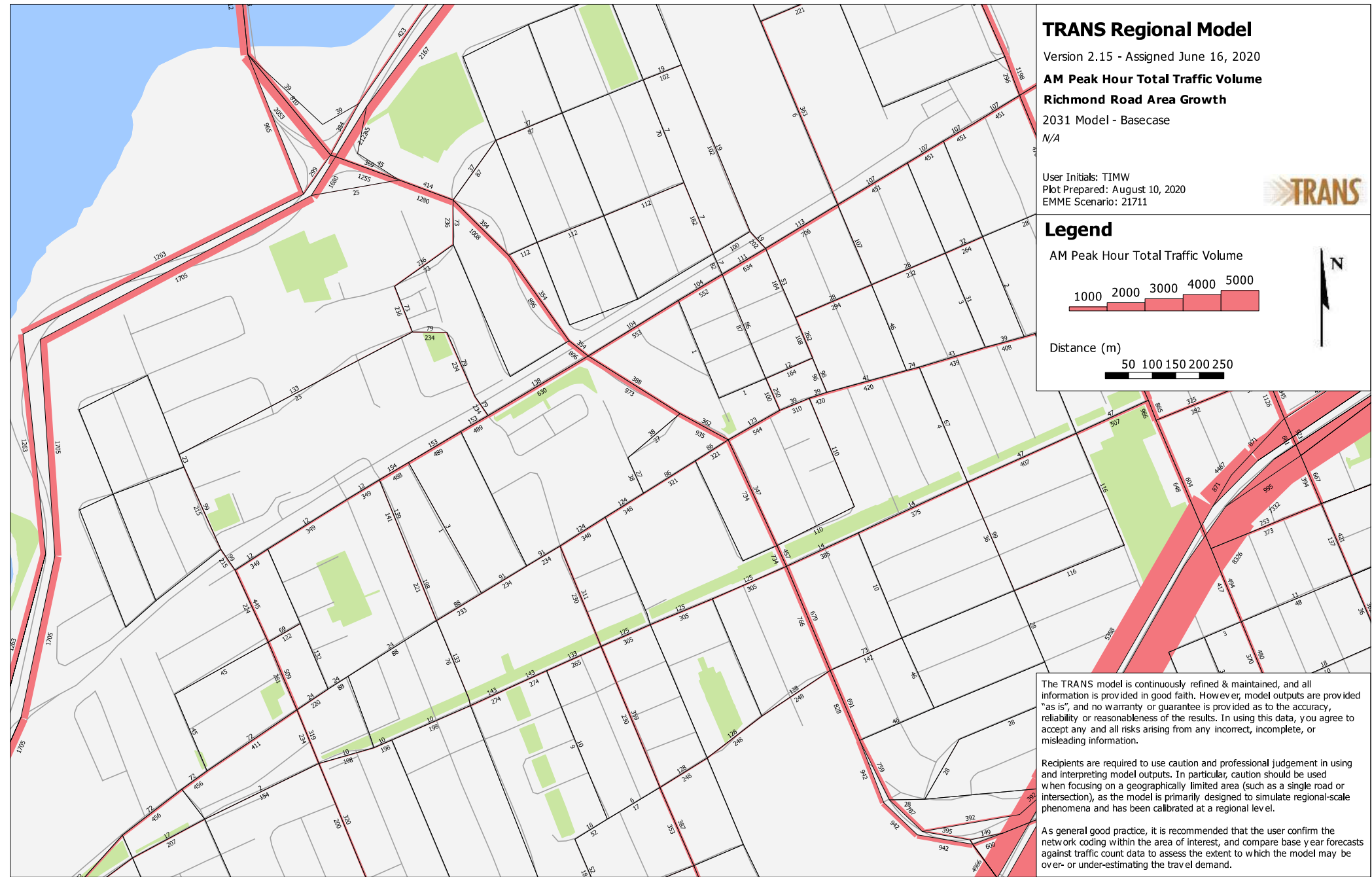
Distance (m)



The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.

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As general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.



Attachment 8

TDM Checklist

TDM-Supportive Development Design and Infrastructure Checklist:
Residential Developments (multi-family or condominium)

Legend	
REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
1. WALKING & CYCLING: ROUTES		
1.1 Building location & access points		
BASIC	1.1.1 Locate building close to the street, and do not locate parking areas between the street and building entrances	<input checked="" type="checkbox"/>
BASIC	1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	<input checked="" type="checkbox"/>
BASIC	1.1.3 Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	<input checked="" type="checkbox"/>
1.2 Facilities for walking & cycling		
REQUIRED	1.2.1 Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations (see <i>Official Plan policy 4.3.3</i>)	<input checked="" type="checkbox"/>
REQUIRED	1.2.2 Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible (see <i>Official Plan policy 4.3.12</i>)	<input checked="" type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3 Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks (see <i>Official Plan policy 4.3.10</i>)	<input checked="" type="checkbox"/>
REQUIRED	1.2.4 Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps (see <i>Official Plan policy 4.3.10</i>)	<input checked="" type="checkbox"/>
REQUIRED	1.2.5 Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians (see <i>Official Plan policy 4.3.11</i>)	<input checked="" type="checkbox"/>
BASIC	1.2.6 Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	<input type="checkbox"/>
BASIC	1.2.7 Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	<input type="checkbox"/>
BASIC	1.2.8 Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	<input checked="" type="checkbox"/>
1.3 Amenities for walking & cycling		
BASIC	1.3.1 Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	<input type="checkbox"/>
BASIC	1.3.2 Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	<input type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
2. WALKING & CYCLING: END-OF-TRIP FACILITIES		
2.1 Bicycle parking		
REQUIRED	2.1.1 Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible (see <i>Official Plan policy 4.3.6</i>)	<input checked="" type="checkbox"/>
REQUIRED	2.1.2 Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas (see <i>Zoning By-law Section 111</i>)	<input checked="" type="checkbox"/>
REQUIRED	2.1.3 Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored (see <i>Zoning By-law Section 111</i>)	<input checked="" type="checkbox"/>
BASIC	2.1.4 Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	<input type="checkbox"/>
2.2 Secure bicycle parking		
REQUIRED	2.2.1 Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers (see <i>Zoning By-law Section 111</i>)	<input type="checkbox"/>
BETTER	2.2.2 Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	<input type="checkbox"/>
2.3 Bicycle repair station		
BETTER	2.3.1 Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	<input type="checkbox"/>
3. TRANSIT		
3.1 Customer amenities		
BASIC	3.1.1 Provide shelters, lighting and benches at any on-site transit stops	<input type="checkbox"/>
BASIC	3.1.2 Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	<input type="checkbox"/>
BETTER	3.1.3 Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	<input type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
4. RIDESHARING		
4.1 Pick-up & drop-off facilities		
BASIC	4.1.1 Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	<input type="checkbox"/>
5. CARSHARING & BIKESHARING		
5.1 Carshare parking spaces		
BETTER	5.1.1 Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses (see <i>Zoning By-law Section 94</i>)	<input type="checkbox"/>
5.2 Bikeshare station location		
BETTER	5.2.1 Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	<input type="checkbox"/>
6. PARKING		
6.1 Number of parking spaces		
REQUIRED	6.1.1 Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	<input type="checkbox"/>
BASIC	6.1.2 Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	<input type="checkbox"/>
BASIC	6.1.3 Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly (see <i>Zoning By-law Section 104</i>)	<input type="checkbox"/>
BETTER	6.1.4 Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking (see <i>Zoning By-law Section 111</i>)	<input type="checkbox"/>
6.2 Separate long-term & short-term parking areas		
BETTER	6.2.1 Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	<input type="checkbox"/>

TDM Measures Checklist:
Residential Developments (multi-family, condominium or subdivision)

Legend	
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance
★	The measure is one of the most dependably effective tools to encourage the use of sustainable modes

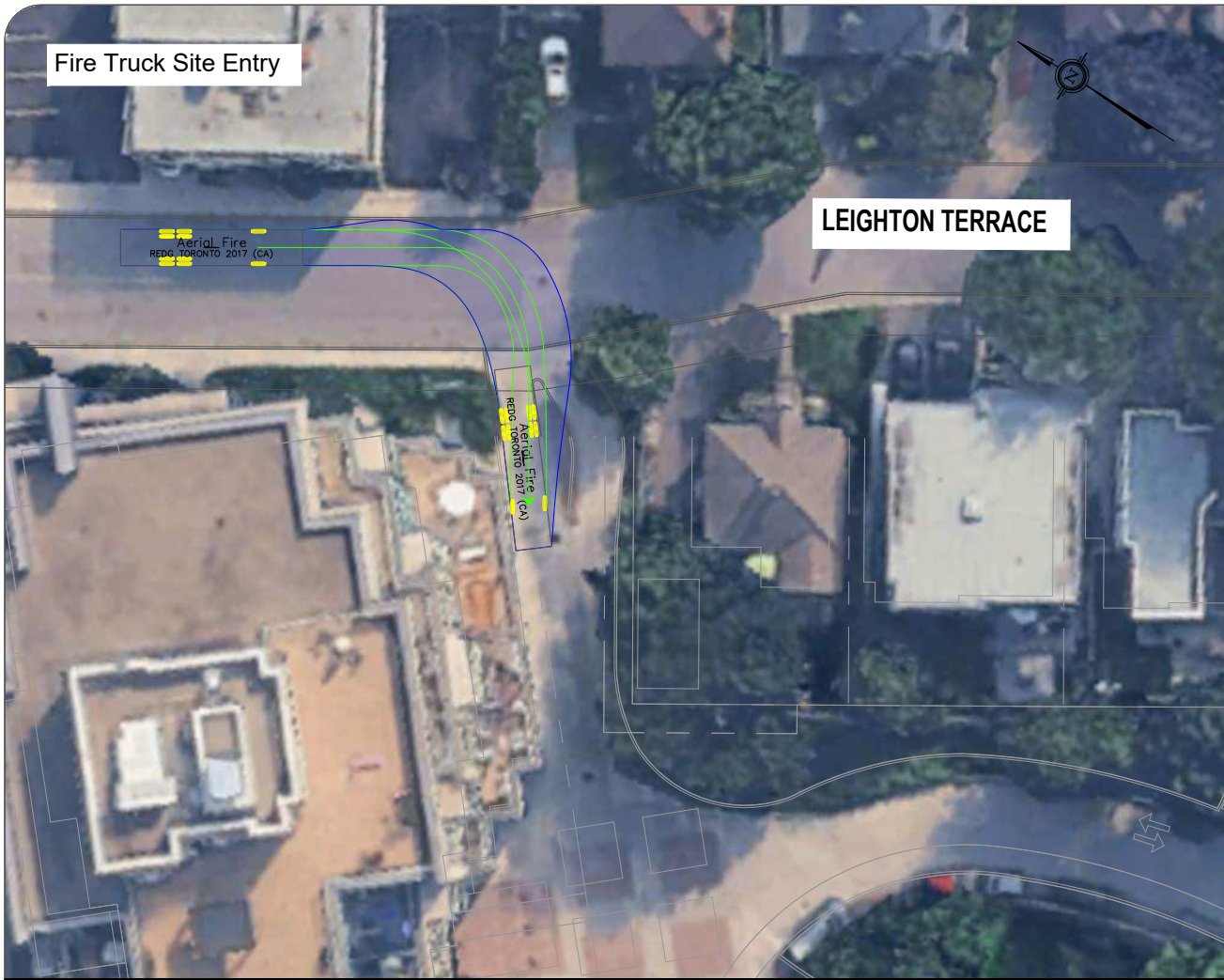
TDM measures: Residential developments		Check if proposed & add descriptions
1. TDM PROGRAM MANAGEMENT		
1.1 Program coordinator		
BASIC ★	1.1.1 Designate an internal coordinator, or contract with an external coordinator	<input type="checkbox"/>
1.2 Travel surveys		
BETTER	1.2.1 Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	<input type="checkbox"/>
2. WALKING AND CYCLING		
2.1 Information on walking/cycling routes & destinations		
BASIC	2.1.1 Display local area maps with walking/cycling access routes and key destinations at major entrances (<i>multi-family, condominium</i>)	<input checked="" type="checkbox"/>
2.2 Bicycle skills training		
BETTER	2.2.1 Offer on-site cycling courses for residents, or subsidize off-site courses	<input type="checkbox"/>

TDM measures: Residential developments		Check if proposed & add descriptions
3. TRANSIT		
3.1 Transit information		
BASIC	3.1.1 Display relevant transit schedules and route maps at entrances (<i>multi-family, condominium</i>)	<input checked="" type="checkbox"/>
BETTER	3.1.2 Provide real-time arrival information display at entrances (<i>multi-family, condominium</i>)	<input type="checkbox"/>
3.2 Transit fare incentives		
BASIC ★	3.2.1 Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in, to encourage residents to use transit	<input checked="" type="checkbox"/>
BETTER	3.2.2 Offer at least one year of free monthly transit passes on residence purchase/move-in	<input type="checkbox"/>
3.3 Enhanced public transit service		
BETTER ★	3.3.1 Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels (<i>subdivision</i>)	<input type="checkbox"/>
3.4 Private transit service		
BETTER	3.4.1 Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs)	<input type="checkbox"/>
4. CARSHARING & BIKESHARING		
4.1 Bikeshare stations & memberships		
BETTER	4.1.1 Contract with provider to install on-site bikeshare station (<i>multi-family</i>)	<input type="checkbox"/>
BETTER	4.1.2 Provide residents with bikeshare memberships, either free or subsidized (<i>multi-family</i>)	<input type="checkbox"/>
4.2 Carshare vehicles & memberships		
BETTER	4.2.1 Contract with provider to install on-site carshare vehicles and promote their use by residents	<input type="checkbox"/>
BETTER	4.2.2 Provide residents with carshare memberships, either free or subsidized	<input type="checkbox"/>
5. PARKING		
5.1 Priced parking		
BASIC ★	5.1.1 Unbundle parking cost from purchase price (<i>condominium</i>)	<input checked="" type="checkbox"/>
BASIC ★	5.1.2 Unbundle parking cost from monthly rent (<i>multi-family</i>)	<input checked="" type="checkbox"/>

TDM measures: <i>Residential developments</i>		Check if proposed & add descriptions
6. TDM MARKETING & COMMUNICATIONS		
6.1 Multimodal travel information		
BASIC	★ 6.1.1 Provide a multimodal travel option information package to new residents	<input checked="" type="checkbox"/>
6.2 Personalized trip planning		
BETTER	★ 6.2.1 Offer personalized trip planning to new residents	<input type="checkbox"/>

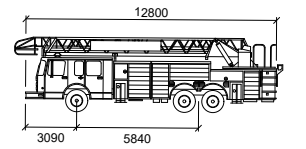
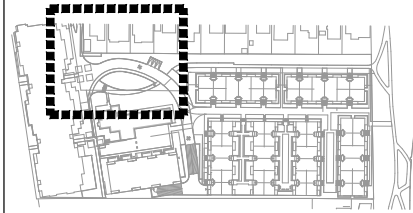
Attachment 9

Turning Templates



Notes:

Key Plan:



Aerial Fire

	mm
Width	: 2540
Track	: 2540
Lock to Lock Time	: 6.0
Steering Angle	: 37.0

FORWARD MOVEMENT

REVERSE MOVEMENT

01	Issued for Review:	CH	2026-02-20
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			

CGH Transportation
 6 Plaza Court
 Ottawa, ON
 K2H 7W1
 (343) 999-9117

CLIENT: Concorde Properties
 408 Tweedsmuir Ave.
 Ottawa, ON K1Z 5N5

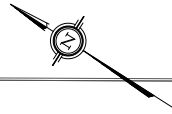
ARCHITECT:

SITE:
 114 Richmond Road

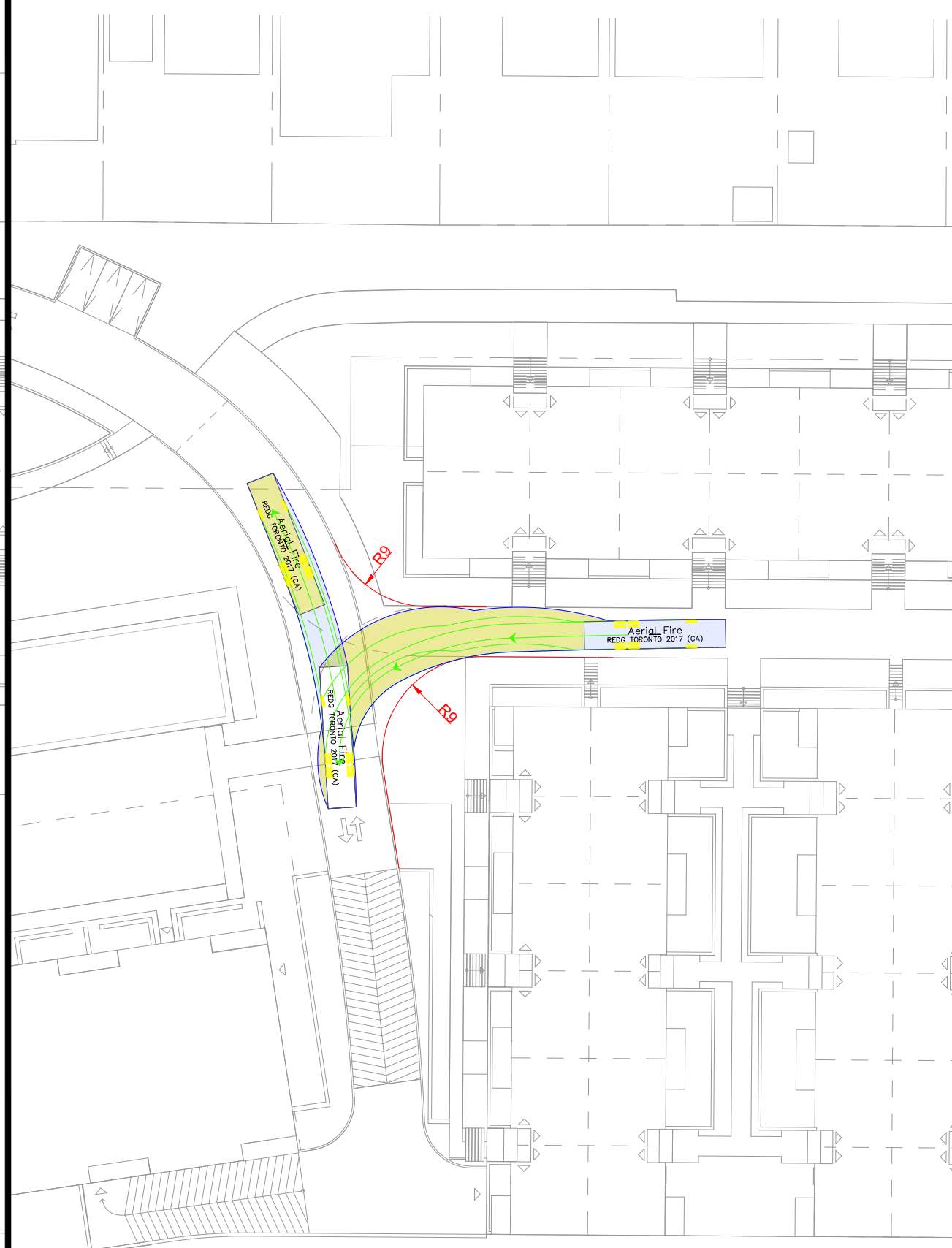
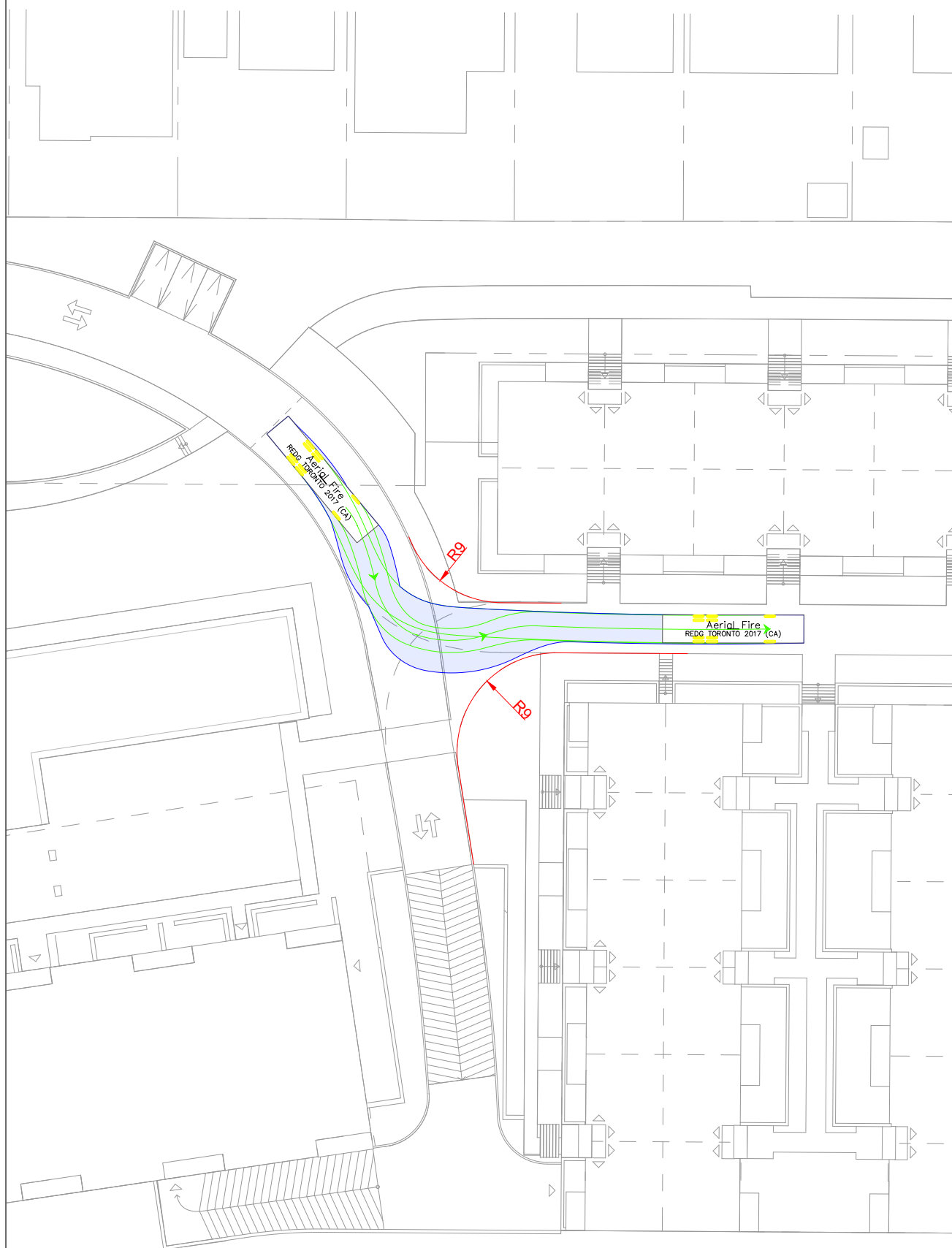
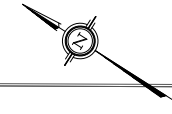
TITLE: Site Access
 Turn Templates

SCALE: AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2026-02-20	CH	AL
PROJECT NO:	DRAWING NO:	REVISION:	
2025-215	001	01	

Fire Truck Turn Around West Forward

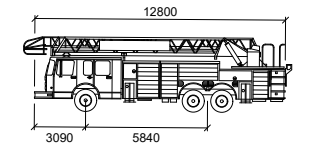
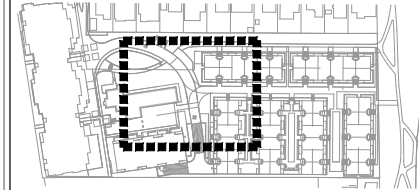


Fire Truck Turn Around West Reverse



Notes:

Key Plan:



Aerial Fire

	mm
Width	: 2540
Track	: 2540
Lock to Lock Time	: 6.0
Steering Angle	: 37.0

FORWARD MOVEMENT

REVERSE MOVEMENT

01	Issued for Review:	CH	2026-02-20
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			

CGH Transportation
 6 Plaza Court
 Ottawa, ON
 K2H 7W1
 (343) 999-9117

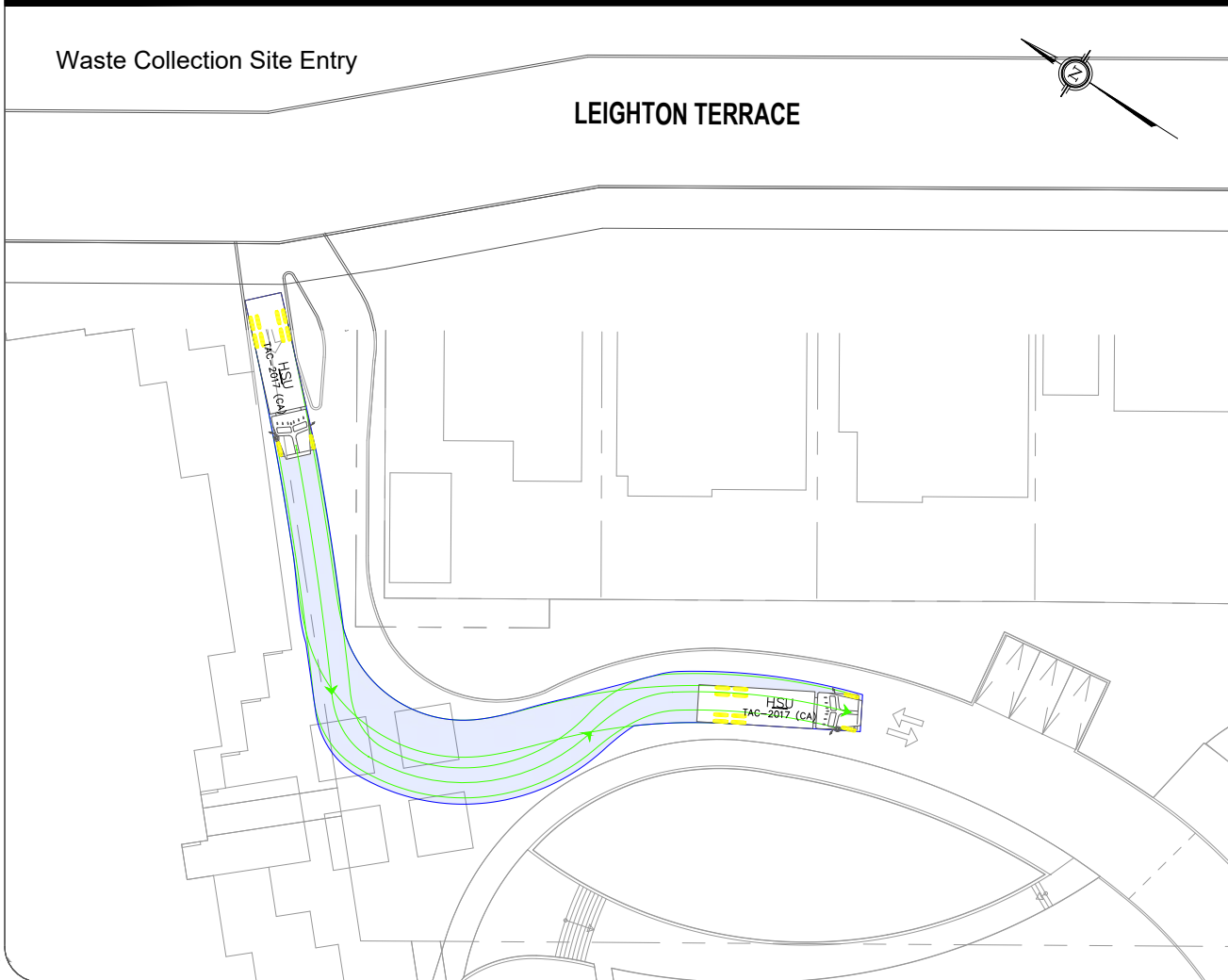
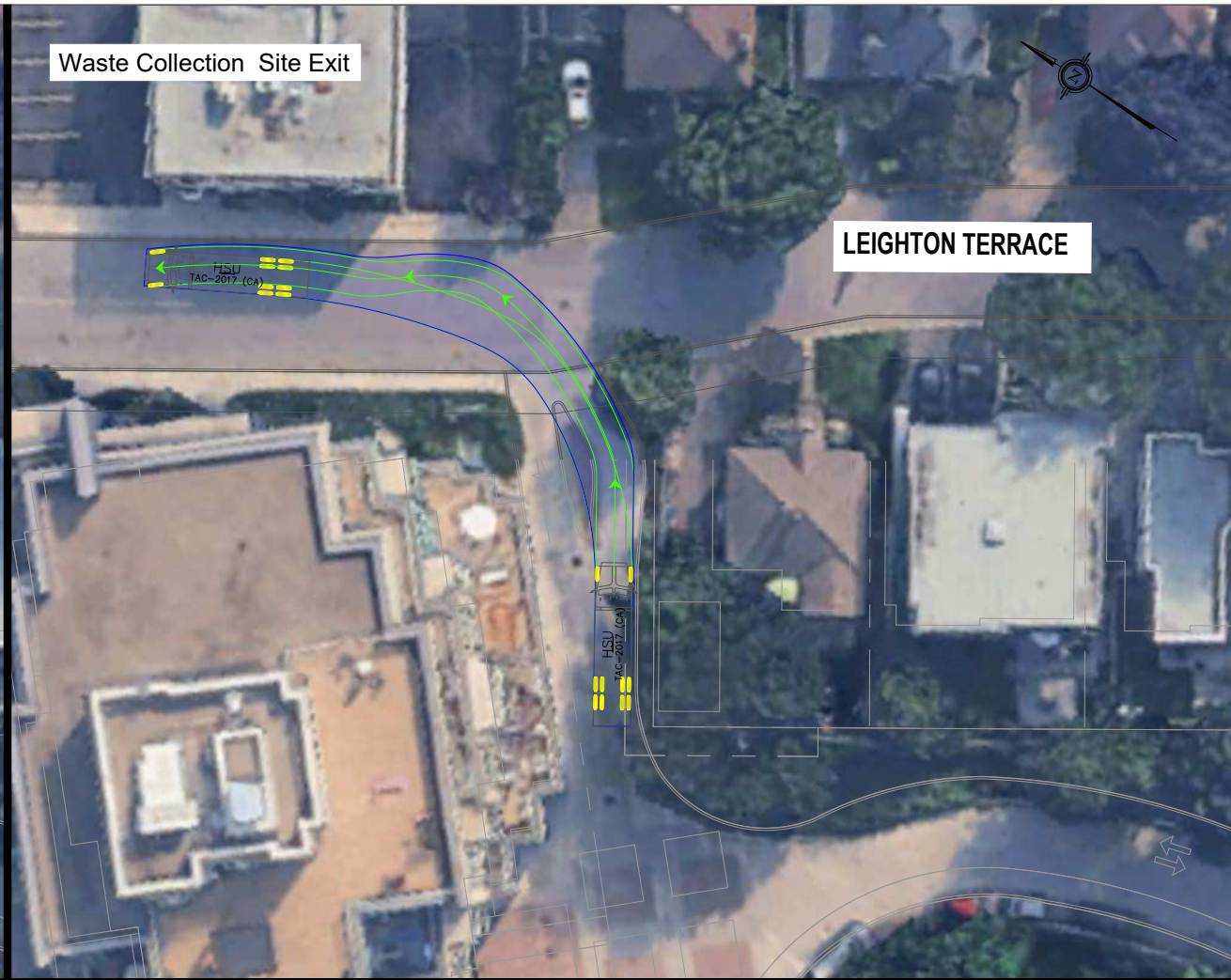
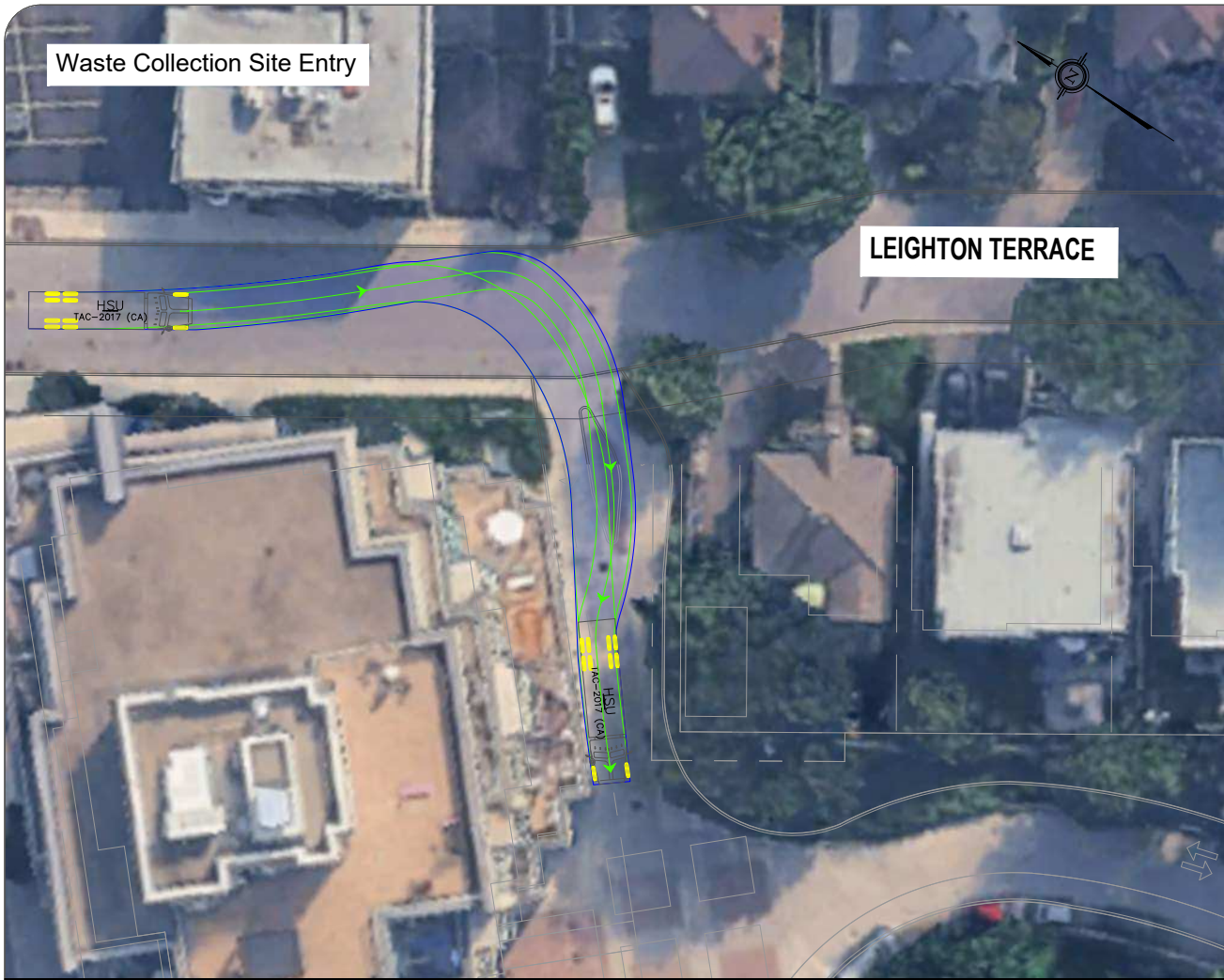
CLIENT: **Concorde Properties**
 408 Tweedsmuir Ave.
 Ottawa, ON K1Z 5N5

ARCHITECT:

SITE:
114 Richmond Road

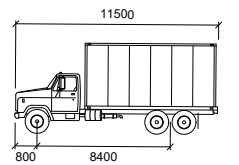
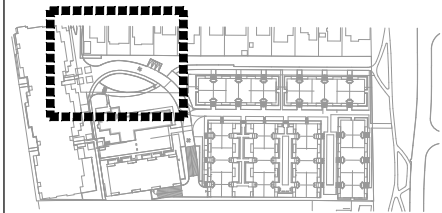
TITLE:
**Mid-Site Turn Around
 Turn Templates**

SCALE: AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2026-02-20	CH	AL
PROJECT NO:	DRAWING NO:	REVISION:	
2025-215	002	01	



Notes:

Key Plan:



HSLU
 Width : 2600 mm
 Track : 2600 mm
 Lock to Lock Time : 6.0
 Steering Angle : 40.0

FORWARD MOVEMENT
 REVERSE MOVEMENT

01	Issued for Review:	CH	2026-02-20
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			

CGH Transportation
 6 Plaza Court
 Ottawa, ON
 K2H 7W1
 (343) 999-9117

CLIENT: Concorde Properties
 408 Tweedsmuir Ave.
 Ottawa, ON K1Z 5N5

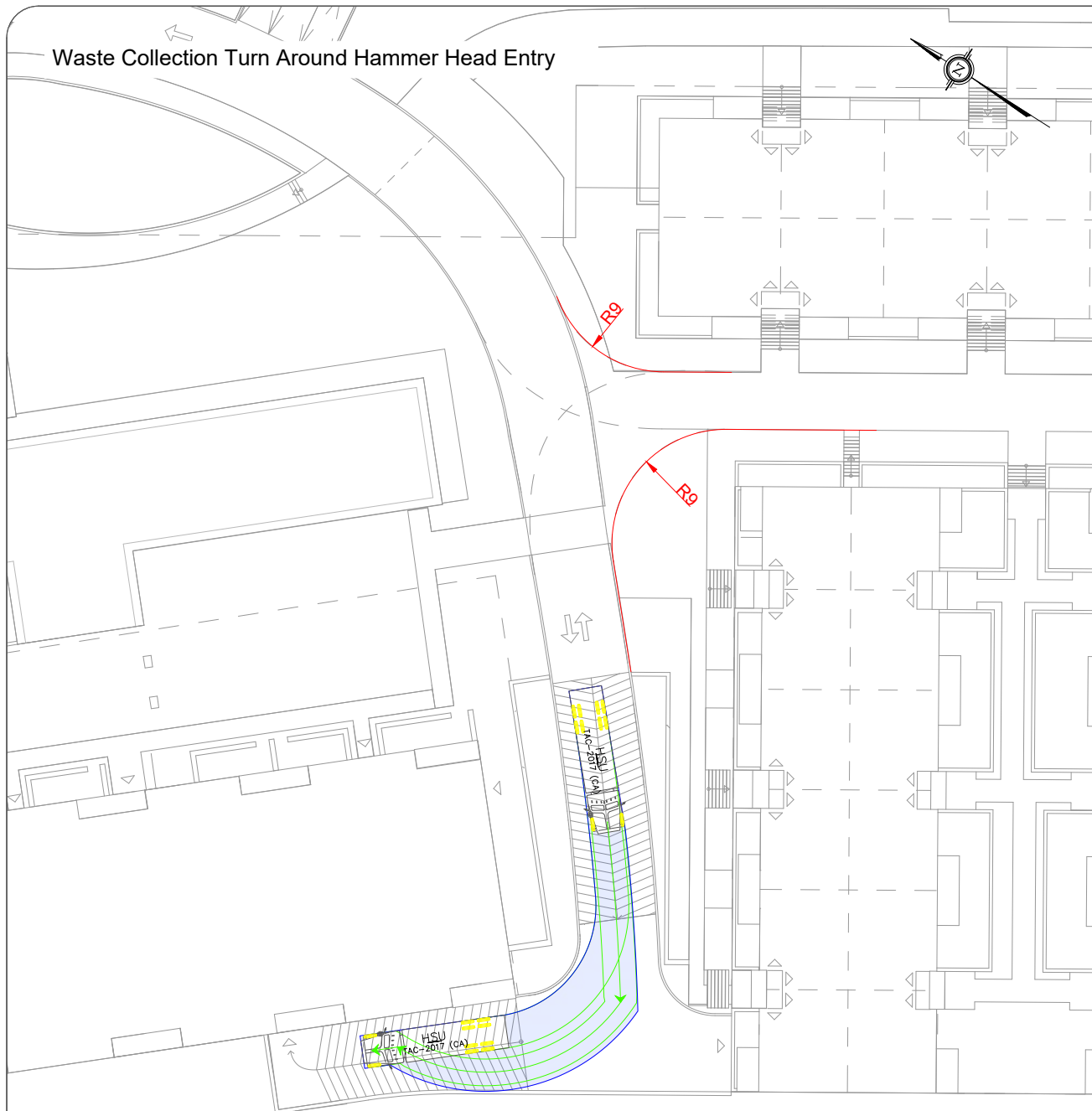
ARCHITECT:

SITE:
 114 Richmond Road

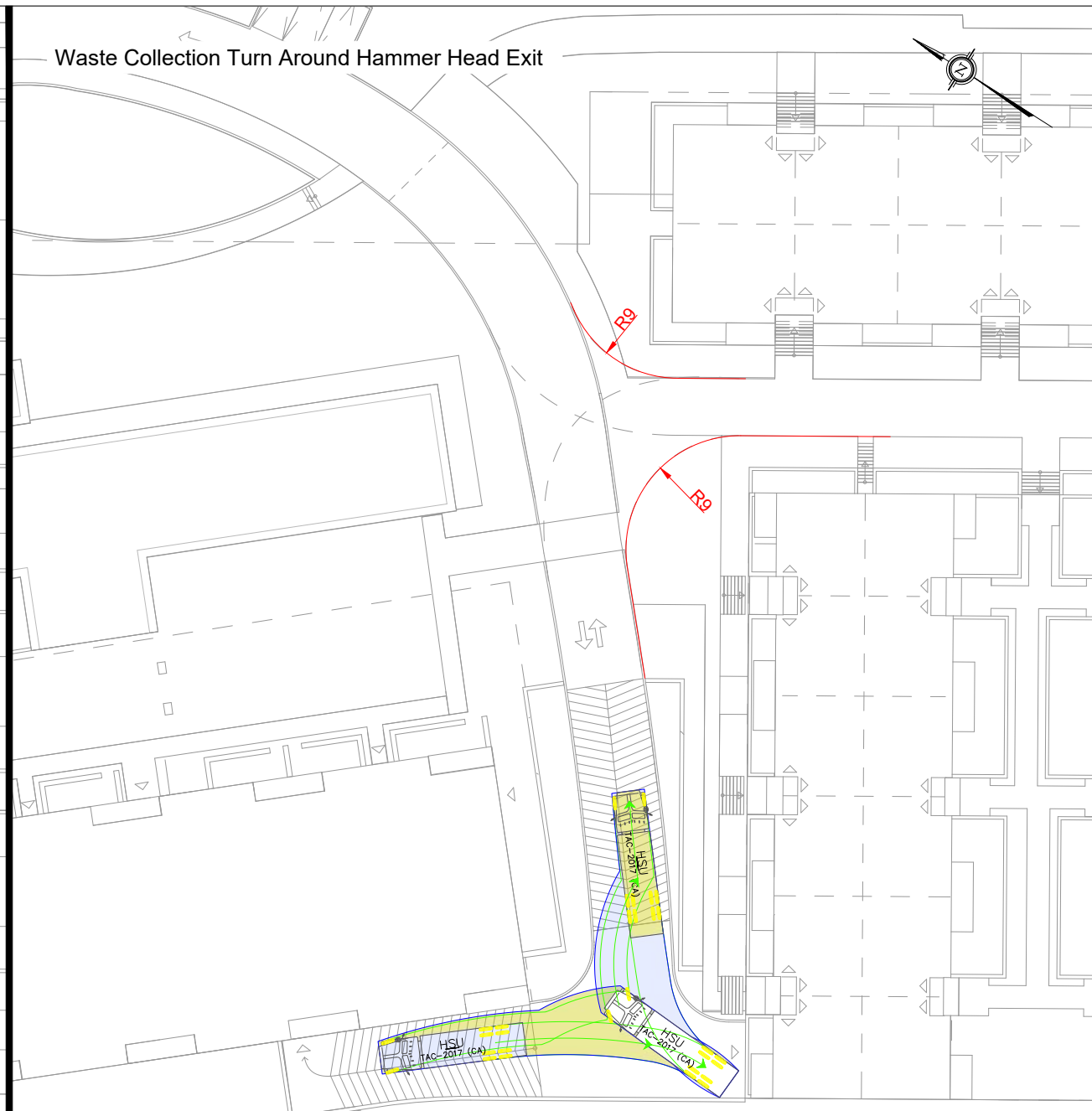
TITLE: Site Access
 Turn Templates

SCALE: AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2026-02-20	CH	AL
PROJECT NO:	DRAWING NO:	REVISION:	
2025-215	003	01	

Waste Collection Turn Around Hammer Head Entry

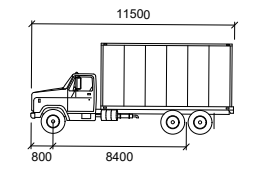
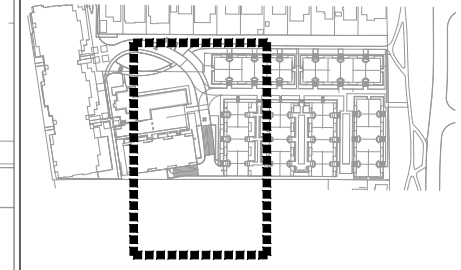


Waste Collection Turn Around Hammer Head Exit



Notes:

Key Plan:



HSU
 Width : 2600 mm
 Track : 2600
 Lock to Lock Time : 6.0
 Steering Angle : 40.0

FORWARD MOVEMENT

REVERSE MOVEMENT

01	Issued for Review:	CH	2026-02-20
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			

CGH Transportation
 6 Plaza Court
 Ottawa, ON
 K2H 7W1
 (343) 999-9117

CLIENT: **Concorde Properties**
 408 Tweedsmuir Ave.
 Ottawa, ON K1Z 5N5

ARCHITECT:

SITE:
 114 Richmond Road

TITLE: **Hammer Head Turn Around
 Turn Templates**

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2026-02-20	CH	AL
PROJECT NO:	DRAWING NO:	REVISION:	
2025-215	004	01	