May 22, 2025

Castleglenn Consultants
Engineers, Project Managers & Planners

Ms. May Pham
Senior Manager: Land Development
Richcraft Homes
2280 St. Laurent Boulevard
Ottawa, Ontario
K1G 4K1

Re: Trailsedge Phase 5 - Updated Traffic Analysis and Design – Revision No. 1
Review of Requirements for Fern Casey Street/Frank Bender Street Intersection

Richcraft Homes is preparing for the northerly expansion of the Trailsedge development. The subdivision (Trailsedge Phase 5) is located south of Innes Road, north of Brian Coburn Boulevard and west of Mer-Bleue Road in the Orleans community.

This sub-division was addressed within the approved "*East Urban Community (EUC), Phase 3 Area Community Design Plan (CDP) Master Transportation Study* (MTS)" (Dec 9th, 2020). This 5-year old initiative was based on traffic volume information that was collected in 2016-2017 and had recommended that the future Fern Casey Street / Frank Bender Street intersection located 320m north of the Brian Coburn Blvd./Fern Casey Street roundabout be configured as a roundabout.

Richcraft retained Castleglenn to consider the viability and undertake an assessment of the Fern Casey Street / Frank Bender Street intersection using current information as being configured either as a STOP-controlled intersection or a roundabout.

On January 3rd, 2025, the City of Ottawa requested Castleglenn to proceed with the re-evaluation of the Frank Bender Street / Fern Casey Street intersection and committed to soliciting internal feedback once submitted. A report, dated March 19th 2025, was submitted and reviewed by City of Ottawa staff. Comment and concerns related to issues such as accommodation of articulated and conventional buses for specific turning movements, the desire to have a raised centre median rather than a depressed centre island associated with a mini-roundabout and confirmation of adherence to City policy and guidelines regarding pathways and sidewalks. This revision document is intended to fully address these additional requests and concerns.

1. Scope of Technical Memorandum

The scope of work for this revised technical memorandum… :

- referenced the most up-to-date Trailsedge Phase 5 subdivision plan (and Trailsedge Phase 4 plans), updated traffic generation rates and a Vistro™ model from the 2020 MTS to forecast the future traffic volumes,
- undertook traffic analyses based on the new updated forecast ultimate traffic volumes – assuming both an at-grade intersection and a roundabout configuration,
- developed conceptual designs of both an at-grade intersection and a roundabout that considered forecast traffic analyses results that complied with City roadway intersection and roundabout design guidelines as regards transit circulation, and
- includes a final meeting with City of Ottawa Staff to discuss the results of this revision document intended to finalize the design approach to be adopted.

2. *Analyses*

For ease of reference, each of the above elements are addressed under the following headings within this technical memorandum along with the relevant attachments.

A. Study Area

Figure A-1 illustrates the location of the Fern Casey Street / Frank Bender Street intersection within the TrailsEdge Phase 5 development. The intersection would be connected to the existing road network by an extension of Fern Casey Street, north of the Brian Coburn Boulevard / Fern Casey Street roundabout.

The TrailsEdge Phase 4 development along Brian Coburn Boulevard is also illustrated below.

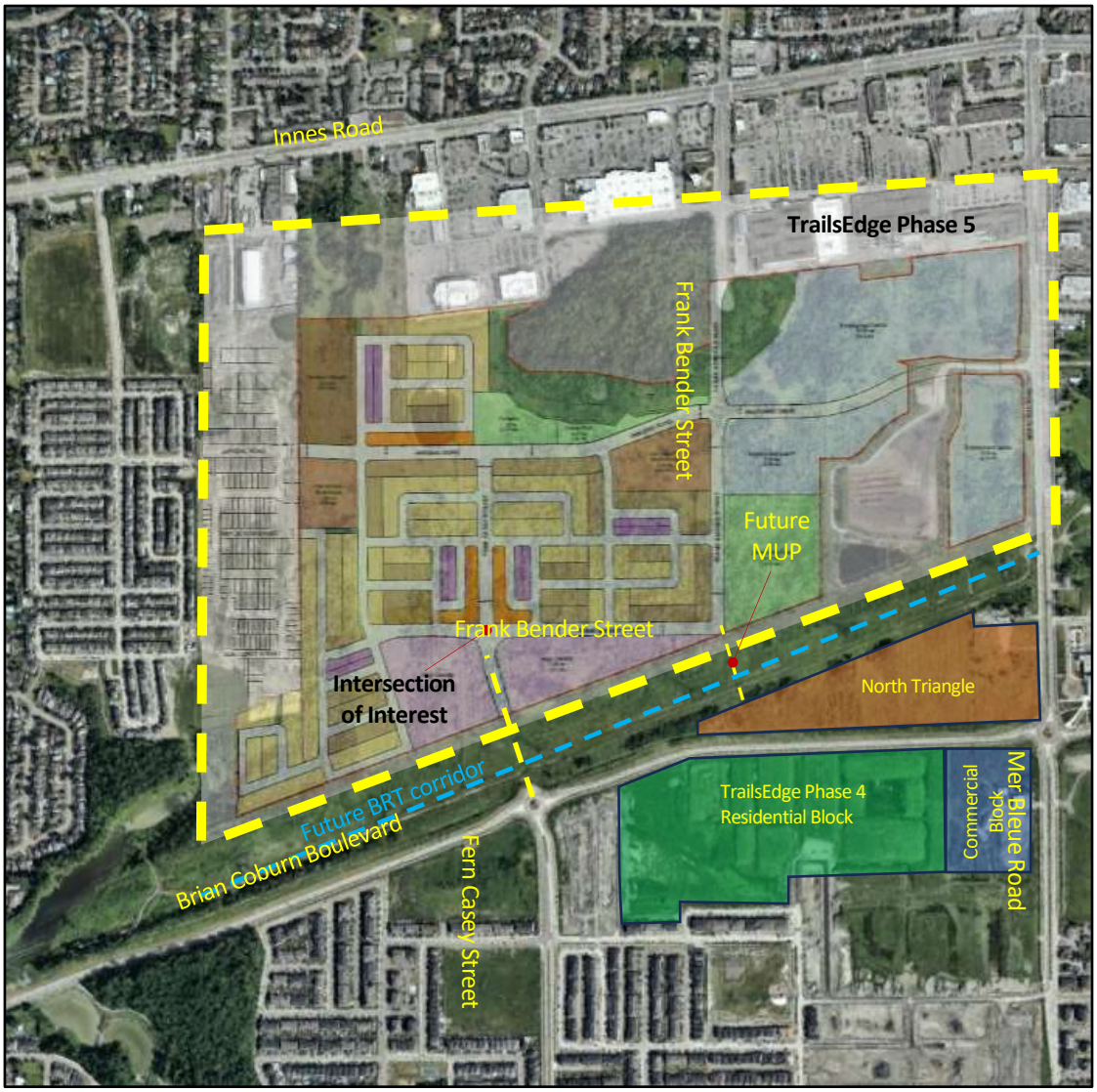

Figure A-1: Study Area

B. Traffic Generation

Several changes have been made to the Trailsedge Phase 4 and Phase 5 plans over the last five-years. These changes included changes to the original 2020 MTS Phase 5 concept plan, which led to a reduction in residential units.

B1. Trailsedge Phase 5 Updated Generation Rates

Table B-1illustrates the updated residential unit count that was recently provided by Richcraft.

Table B-1: Trailsedge Phase 5: 2020 vs. 2024 Residential Unit Breakdown

Land Use	***2020 MTS Study***	***Nov. 2024 Richcraft Update[1]***	***Difference***
	Forecast Year: 2031	***Forecast Year: 2046***	
Low Density Residential	450	1,140	+690
Medium Density Residential	1,081	156	-925
High Density Residential	928	503	-425
Total	**2,459**	**1,799**	**-660 (- 27%)**

1. An updated unit count projection based on the latest Trailsedge Phase 5 concept plan was provided by Richcraft November, 2024

This new (Nov. 2024) residential unit count is 27% lower than that assumed within the 2020 Trailsedge Phase 5 development MTS study.

B2. Trailsedge Phase 4 Updated Traffic Generation Estimates

Castleglenn recently re-evaluated the land uses associated with Trailsedge Phase 4 community which represents the residential, commercial and mixed-use development to the south of the Brian Coburn Boulevard corridor as illustrated in Figure A-1. This community includes:

- *The Trailsedge Phase 4 Residential Block:* The Phase 4 land uses have been confirmed as providing 456 dwellings at the time of build-out.
- *The Proposed Commercial Retail block* on the corner of Brian Coburn/Mer Bleue (which was previously excluded from the 2020 study) has now been included within these analyses. It was estimated that roughly 15% of the commercial-retail area's traffic would originate from, and be destined to, the Phase 5 lands and make use of the Fern Casey north corridor.
- *The North Triangle Mixed-Use Lands* are located south of the future transit corridor, west of Mer Bleue and north of Brian Coburn Boulevard. For the purposes of this study this triangular parcel was assumed to accommodate 352 mid-rise (4-to-10 floors) residential units, 89 retail employees and 207 general office employees. A moderate motor-vehicle interaction between the Phase 5 lands and this triangular parcel was thought to be applicable given the planned pedestrian pathway linkage linking Phase 5 directly to the triangular parcel. The retail portion of the triangular parcel was anticipated to generate 80-to-90 vehicle trips in total; assuming 15% of the total traffic is attributed the Phase 5 lands resulted in 12-to-14 vehicle trips.

Table B-2 indicates the above updated land uses and corresponding traffic generation of the Phase 4 Community to the south. For comparison, purposes, its noted that the Phase 4 traffic volumes were estimated to be almost 5 times that which was assumed in the earlier 2020 MTS study.

Table B-2: Trailsedge Phase 4: Trip Generation Breakdown

Trailsedge Phase 4 Development	*2024 Land Uses*[3]	*AM Trips*			*PM Trips*		
		IN	*OUT*	*Total*	*IN*	*OUT*	*Total*
Residential Block	141 Single-detached and 315 Semi-detached, townhouses, rowhouses	70	209	**279**	208	124	**332**
Commercial Block	94,260 sqft of commercial space[4]	405	363	**768**	482	475	**957**
Mixed-Use North Triangle[1]	352 mid-rise, commercial space with 89 employees and office space with 207 employees	192	194	**386**	183	207	**390**
	Total	**664**	**756**	**1,420**	**864**	**800**	**1,664**
	2020 MTS Study Traffic Forecast[2]	93	201	294	201	143	344
	Difference	**571**	**555**	**1,126 (483%)**	**663**	**657**	**1,320 (484%)**

1. Referenced from "*Proposed Trailsedge Phase 4 Richcraft Homes Transportation Impact Assessment*" report, Castleglenn, 2021
2. Reference the title of the 2020 report – This study excluded the Commercial Block at the SW corner of Mer Bleue/Brian Coburn
3. ITE Land Use No. 210 for Single Detached, 215 for Semi-detached, townhouses, rowhouses, 221 for mid-rise, 821 for commercial space, 710 for general office building (ITE Trip Generation Manual, 11th edition)
4. Refenced from *"Proposed Trailsedge Phase Richcraft Homes Transportation Impact Assessment: Addendum No. 1"* report, Castleglenn, 2025

C. Traffic Forecasting

The Vistro™ traffic model used to produce the 2020 MTS Study was refined to include the latest land uses, traffic generation rates and traffic distribution trends. The proposed development, adjacent developments and existing traffic 2024 base year traffic information were used to update the traffic forecasts. The previous 2020 MTS study assumed a 2031 ultimate time horizon year (i.e. for full buildout), which has since been pushed back to 2046.

Figure C-1 indicates the forecast 2046 volumes anticipated to occur at the Fern Casey Street / Frank Bender Street intersection.

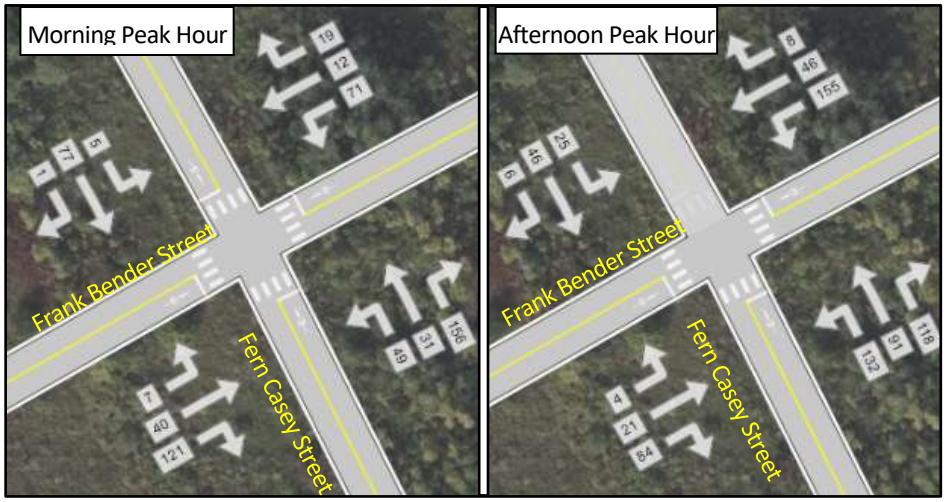

Figure C-1: 2046 Forecast Traffic Volumes

D. Traffic Analysis

The 2046 traffic forecasts illustrated in Figure C-1 represent build-out conditions of the entire Phase 5 development.

For comparative evaluation purposes, the Fern Casey Street / Frank Bender Street intersection was examined both as a STOP-controlled intersection and as a roundabout configuration in terms of traffic operations. The results of the traffic analysis are presented in following sections.

D1. Synchro STOP Controlled Intersection Capacity Analysis

Intersection Capacity Analysis was conducted for the 2046 horizon year using Synchro™ 10 software, which incorporates Highway Capacity Manual (HCM) 6th edition methodologies to determine the average delay, level-of-service (LOS) (based upon delay), volume-to-capacity (v/c) and performance metrics. The analyses assumed a peak hour factor of 1.0 which simulates the busiest 15-minute-period of the overall peak hour. [See Attachment "A-1" for the intersection capacity analysis report.]

Figure E-1 illustrates the geometric layout of the All-Way Stop Controlled Intersection.

Table D-1 provides a summary of the resulting intersection capacity analyses and indicates that the Fern Casey Street / Frank Bender Street intersection is anticipated to provide satisfactory operations when Phase 5 is completed by 2046. The intersection was forecast to provide an acceptable LOS "B" for the critical approaches, a maximum delay-per-vehicle of 11.5 seconds, result in a 95th percentile queue length of 17.3 meters, and a v/c ratio of 0.45.

Table D-1: Forecast 2046 Intersection Capacity Analysis (AWSC)

Intersection of		**Control Type**	**Critical Approach/ Movement**	**Volumes (vph)**	**Weekday Morning Peak Hour (Afternoon Peak Hour)**			
					Average Delay per Vehicle (seconds)	**Level of Service**	**95th Percentile Queue (m)**	**Volume-to-Capacity Ratio (v/c)**
1.	Fern Casey Street and Frank Bender Street	All Way Stop Control	NB	236 (341)	9.0 (11.5)	A (B)	9.0 (17.3)	0.28 (0.45)
			WB	102 (209)	8.7 (10.5)	A (B)	3.8 (9.8)	0.14 (0.31)

Values outside of brackets represent morning peak hour results.
Values in brackets represent afternoon peak hour results.

D2. Sidra Roundabout Intersection Capacity Analysis

A City of Ottawa's "*Roundabout Initial Feasibility Screening Tool*" [Feb. 22, 2013] [See Attachment "C"] was completed to provide an assessment of the feasibility of a roundabout in comparison to other forms of traffic control. The Tool, in concert with the content of this letter, is intended to suffice as an Intersection Control Study (ICS) that confirms the feasibility of a roundabout at the Fern Casey/Frank Bender intersection as was recommended in the 2020 MTS Study.

SIDRA Intersection software was also used to analyze the Fern Casey Street / Frank Bender Street intersection, assuming the 2046 forecast traffic volumes.

The parameters used in the analyses were as follows:

- A circulating lane width of 5 meters-per-lane.
- A peak hour factor (PHF) of 1.0.
- A maximum 10° angle on each approach.
- Assumed 15 pedestrian-per-hour crossing volume.
- A heavy vehicles percentage of 2 percent.
- 4.5m wide approach/departure lanes.
- A 20-meter diameter central island consisting of a raised 16m diameter raised island and a 2m wide trunk apron area.

Table D-2: Forecast 2046 Intersection Capacity Analysis (Roundabout)

Intersection of		Control Type	Critical Approach/ Movement	Volumes (vph)	Weekday Morning Peak Hour (Afternoon Peak Hour)			
					Average Delay per Vehicle (seconds)	Level of Service	95th Percentile Queue (m)	Volume-to-Capacity Ratio (v/c)
1.	Fern Casey Street and Frank Bender Street	Roundabout	South Leg NB Approach	236 (341)	5.2 (6.1)	A (A)	5.9 (8.7)	0.164 (0.233)
			East Leg WB Approach	102 (209)	7.7 (8.5)	A (A)	2.4 (6.1)	0.076 (0.172)

Values outside of brackets represent morning peak hour results.
Values in brackets represent afternoon peak hour results.

The results summarized within Table D-2 [See Attachment "A-2" for the Sidra Reports] indicate that the Fern Casey Street / Frank Bender Street intersection is anticipated to provide satisfactory operational results during the 2046 horizon year if configured as a roundabout [See Figure E-2.] The south-leg (northbound approach) is forecast to provide an excellent LOS "A", average vehicle delays of 5.2 seconds in the AM and 6.1 in the PM when travelling through the roundabout, 95th percentile queue lengths of 1-or-2 vehicles, and v/c ratios of 0.16 in the morning peak hour and 0.23 in the afternoon peak hour.

E. Geometric Considerations

The Fern Casey Street / Frank Bender Street intersection was determined to offer satisfactory traffic operations if configured as either a STOP-controlled intersection or a roundabout. Both configurations were determined to represent viable options from a traffic operations perspective. Conceptual designs for both alternatives are presented below.

Both configurations would be required to comply with a posted speed limit of 30 km/h as required by the City of Ottawa's "*30 km/h Speed Limit Policy* (April 12, 2017)".

E1. At-Grade STOP All-Way STOP Controlled Intersection

Figure E-1 illustrates a concept of the Fern Casey Street / Frank Bender Street intersection as All-Way STOP controlled.

The concept provides for a shared left, right and through movement via a single lane in each direction. Pedestrian crossings on all 4 legs of the intersection connecting to sidewalks and a 3-meter multi-use path (MUP) along Fern Casey Street and on the south side of Frank Bender Street, east of the intersection. [See Attachment "B-1" for full drawing.]

Figure E-1: AWSC Concept Drawings

E2. Conceptual Roundabout

Figure E-2 illustrates the conceptual drawing of the Fern Casey Street / Frank Bender Street intersection as a roundabout. [See Attachment "B-2" for full drawing.]

The roundabout has been designed to accommodate articulated buses (A-Bus) and standard buses (B-12) assuming the following transit route vehicle requirements at the intersection.

- The northbound right-turn movement from Fern Casey South onto Frank Bender East,
- The southbound left-turn movement from Fern Casey North onto Frank Bender East,
- The westbound right-turn movement from Frank Bender East onto Fern Casey North, and
- The westbound left-turn movement from Frank Bender East onto Fern Casey South.

As well, the roundabout can accommodate heavy single unit (HSU) trucks on all 12 movements at the roundabout through use of the 2.0m wide truck apron that surrounds the central island. When comparing them to the alternative All-Way STOP control configuration, the roundabout, harmonizes mobility to a greater degree, removes unnecessary delay and provides a safer environment. However, roundabouts are typically more expensive to install and maintain than conventional STOP controlled intersections.

The roundabout configuration was designed with an inscribed circle diameter (ICD) of 30 meters with all approach/egress lanes having a width of 4.5 meters. A minimum 2m boulevard between the roadway curb and the sidewalk/multiuse path would be provided at each quadrant of the roundabout. Pedestrian crossings are envisioned at all 4 legs of the intersection. A 3-meter multi-use path (MUP) is illustrated on the east side of Fern Casey Street and on the south side of Frank Bender Street East

Figure E-2: Roundabout Concept Drawings

F. Heavy Vehicle Turning Movements

To ensure compliance with City of Ottawa guidelines, the Fern Casey Street / Frank Bender Street intersection configurations were designed to be able to accommodate heavy vehicle traffic.

- Both the All-Way Stop configuration and the roundabout configuration can accommodate Heavy Single Unit Trucks (HSU – 11.5m long) circulating through the intersection. This vehicle can navigate through the intersection without touching the curbing.
- The All-Way Stop intersection requires the tractor-trailer to cross over the receiving on-coming lane when making a left turn or right turn at intersection. Although this is normally not encouraged from a design perspective on public roadways, (a) this would not occur often, and (b) the all-way stop requires the heavy vehicle motorist to first stop, and assure the way is clear before commencing the maneuver.
- Attachment B-4 illustrates that emergency fire vehicles can navigate the roundabout.
- The roundabout option has a 30m inscribed circle diameter (ICD), channelized islands on each approach and a raised 16m diameter center island. Vehicles, as large as a WB-20 (or larger), cannot navigate through all roundabout turns.

The turning movement diagrams illustrating all heavy vehicles can be found within attachments "B-3" through B-4".

3. Conclusion

The future Fern Casey Street / Frank Bender Street intersection at the time of build-out of Phase 5 Trailsedge community will provide satisfactory traffic operations if configured as either:

- an All-Way STOP controlled intersection with minimal delays and an overall LOS "B"; or
- a roundabout offering yield-controlled access with minimal delays and an overall LOS "A".

Both configurations allow for heavy vehicle and emergency vehicle circulation.

A roundabout configuration as illustrated in Attachment B-2 is recommended from purely a traffic operational and roadway design geometric perspective for the Fern Casey Street / Frank Bender Street intersection.

Respectfully,

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Mr. Konstantin Joulanov BAsc
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ATTACHMENT A:

INTERSECTION CAPACITY ANALYSIS RESULTS

ATTACHMENT A-1:

SYNCHRO (AWSC) 2046 FORECAST

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	40	121	71	12	19	49	31	156	5	77	1
Future Vol, veh/h	7	40	121	71	12	19	49	31	156	5	77	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	40	121	71	12	19	49	31	156	5	77	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.5	8.7	9	8.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	21%	4%	70%	6%
Vol Thru, %	13%	24%	12%	93%
Vol Right, %	66%	72%	19%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	236	168	102	83
LT Vol	49	7	71	5
Through Vol	31	40	12	77
RT Vol	156	121	19	1
Lane Flow Rate	236	168	102	83
Geometry Grp	1	1	1	1
Degree of Util (X)	0.282	0.203	0.138	0.111
Departure Headway (Hd)	4.302	4.358	4.875	4.827
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	833	822	733	740
Service Time	2.338	2.398	2.921	2.873
HCM Lane V/C Ratio	0.283	0.204	0.139	0.112
HCM Control Delay	9	8.5	8.7	8.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.2	0.8	0.5	0.4

Intersection	
Intersection Delay, s/veh	10.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	21	84	155	46	8	132	91	118	25	46	6
Future Vol, veh/h	4	21	84	155	46	8	132	91	118	25	46	6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	21	84	155	46	8	132	91	118	25	46	6
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.7	10.5	11.5	8.9
HCM LOS	A	B	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	39%	4%	74%	32%
Vol Thru, %	27%	19%	22%	60%
Vol Right, %	35%	77%	4%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	341	109	209	77
LT Vol	132	4	155	25
Through Vol	91	21	46	46
RT Vol	118	84	8	6
Lane Flow Rate	341	109	209	77
Geometry Grp	1	1	1	1
Degree of Util (X)	0.445	0.145	0.302	0.111
Departure Headway (Hd)	4.699	4.775	5.197	5.181
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	760	741	686	684
Service Time	2.768	2.868	3.28	3.275
HCM Lane V/C Ratio	0.449	0.147	0.305	0.113
HCM Control Delay	11.5	8.7	10.5	8.9
HCM Lane LOS	B	A	B	A
HCM 95th-tile Q	2.3	0.5	1.3	0.4

ATTACHMENT A-2:

SIDRA (ROUNDABOUT) 2046 FORECAST

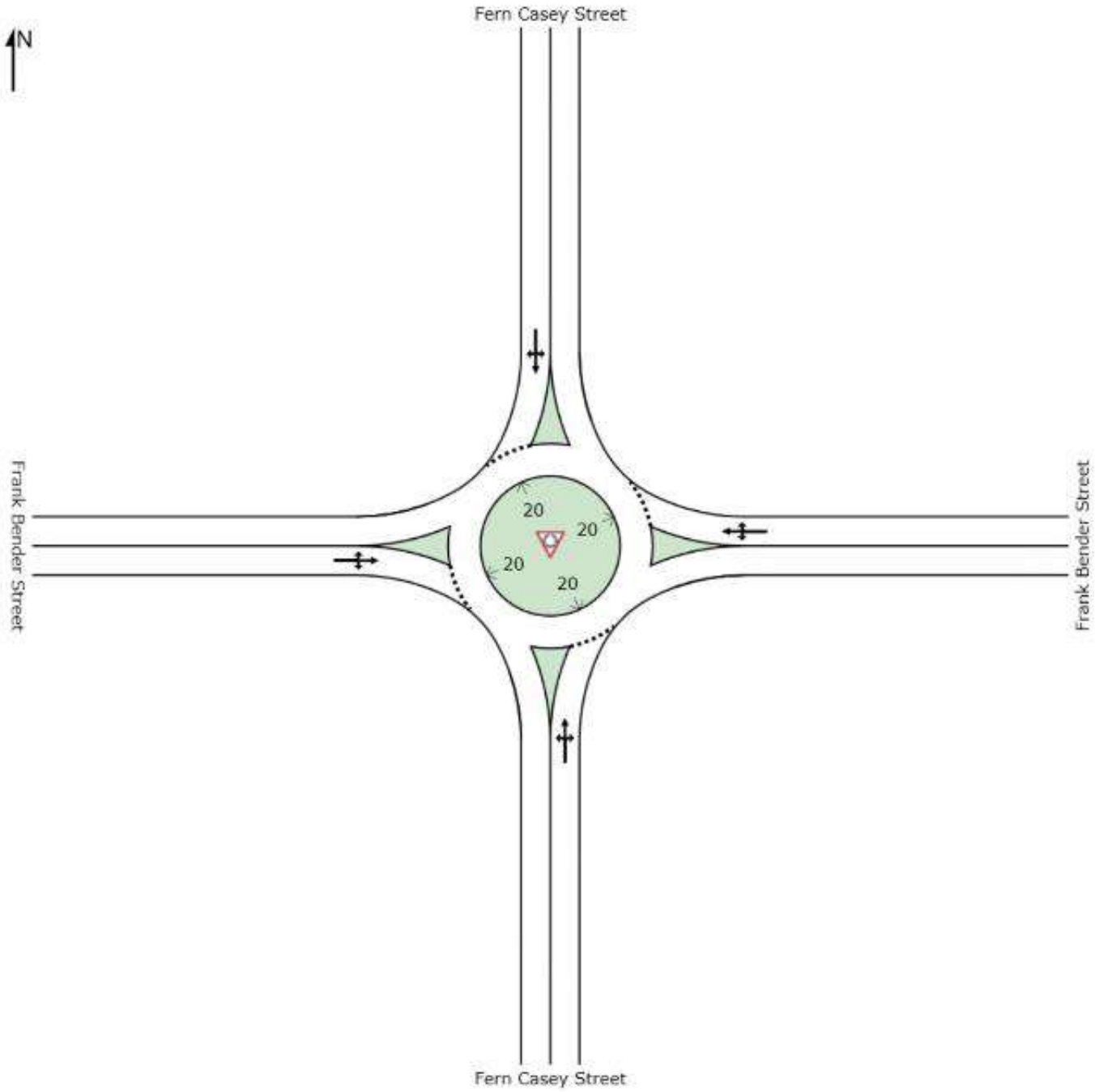
Fern Casey / Frank Bender Mini-Roundabout – 2046 Forecast Analysis

Assuming 5 metre circulating lane, 20 metre centre island diameter (Total ICD = 30m)

Assuming 4.5-metre-wide approach and departure lanes on each leg

Assuming a 1° entry angle on east leg, 3.1° entry angle on north leg, 9.3° entry angle on south leg, and 10.1° entry angle on west leg

Assuming 15 ped / hour crossing each approach



LANE SUMMARY

Site: Fern Casey / Frank Bender Mini-Roundabout 2046 AM

AM Peak Hour
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Fern Casey Street													
Lane 1[d]	248	2.0	1512	0.164	100	5.2	LOS A	0.8	5.9	Full	500	0.0	0.0
Approach	248	2.0		0.164		5.2	LOS A	0.8	5.9				
East: Frank Bender Street													
Lane 1[d]	107	2.0	1412	0.076	100	7.7	LOS A	0.3	2.4	Full	500	0.0	0.0
Approach	107	2.0		0.076		7.7	LOS A	0.3	2.4				
North: Fern Casey Street													
Lane 1[d]	87	2.0	1364	0.064	100	4.9	LOS A	0.3	2.0	Full	500	0.0	0.0
Approach	87	2.0		0.064		4.9	LOS A	0.3	2.0				
West: Frank Bender Street													
Lane 1[d]	177	2.0	1331	0.133	100	4.8	LOS A	0.6	4.4	Full	500	0.0	0.0
Approach	177	2.0		0.133		4.8	LOS A	0.6	4.4				
Intersection	620	2.0		0.164		5.5	LOS A	0.8	5.9				

LANE SUMMARY

Site: Fern Casey / Frank Bender Mini-Roundabout 2046 PM

PM Peak Hour
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Fern Casey Street													
Lane 1[d]	359	2.0	1542	0.233	100	6.1	LOS A	1.2	8.7	Full	500	0.0	0.0
Approach	359	2.0		0.233		6.1	LOS A	1.2	8.7				
East: Frank Bender Street													
Lane 1[d]	220	2.0	1280	0.172	100	8.5	LOS A	0.9	6.1	Full	500	0.0	0.0
Approach	220	2.0		0.172		8.5	LOS A	0.9	6.1				
North: Fern Casey Street													
Lane 1[d]	80	2.0	1186	0.067	100	6.9	LOS A	0.3	2.3	Full	500	0.0	0.0
Approach	80	2.0		0.067		6.9	LOS A	0.3	2.3				
West: Frank Bender Street													
Lane 1[d]	115	2.0	1257	0.091	100	5.0	LOS A	0.4	3.1	Full	500	0.0	0.0
Approach	115	2.0		0.091		5.0	LOS A	0.4	3.1				
Intersection	774	2.0		0.233		6.7	LOS A	1.2	8.7				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

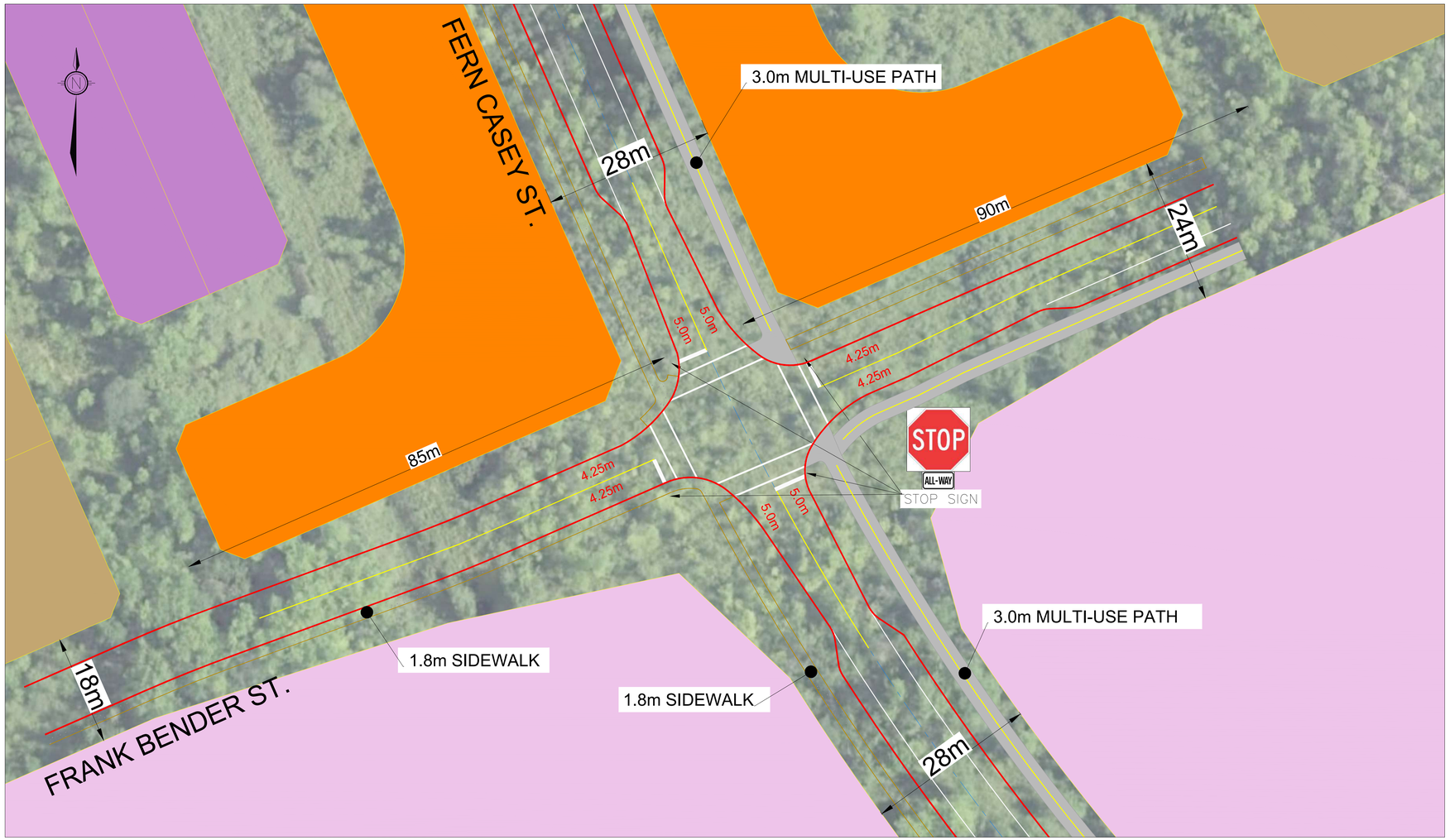
d Dominant lane on roundabout approach

ATTACHMENT B:

CONCEPT DRAWINGS

Attachment B-1:

AWSC Layout



CITY OF OTTAWA

PROPOSED STOP-CPNTROLLED ON
FRANK BENDER ST. AND FERN CASEY ST.
LAYOUT PLAN

Castleglenn Consultants
Engineers, Project Managers & Planners

PROJECT REF. NUMBER: 7337

Contract No. 7337	Dwg. No.
Sheet 1 of 1	
Asset Group	
Des. A.P.	Chk'd.
Dwn. A.P.	Chk'd.
Utility Circ. No.	Index No.
Cost. Inspector	
Scale: 8m 0 8m HORIZ 1:400	

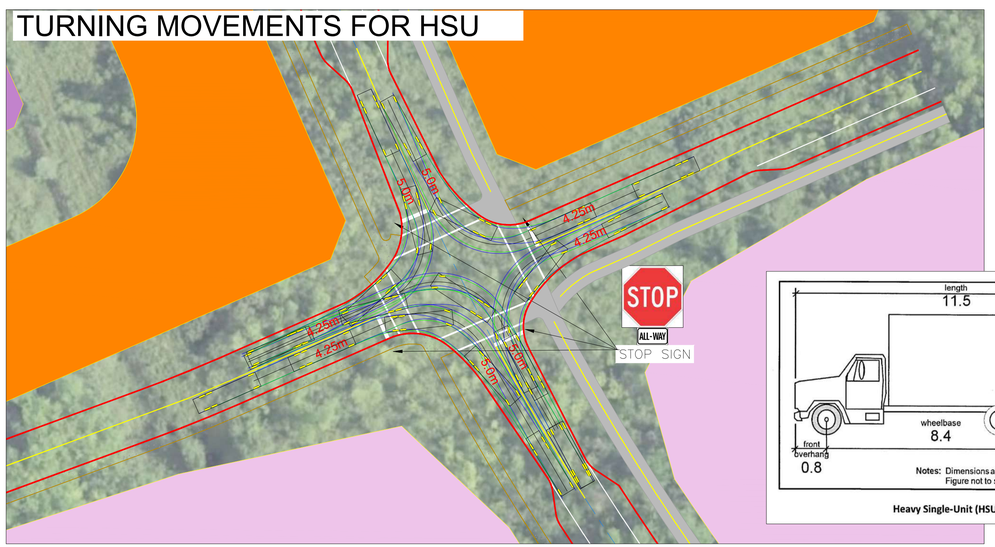
NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

REVISIONS	No.	Description	By	Date (dd/mm/yy)
	1			20/05/25
	2			

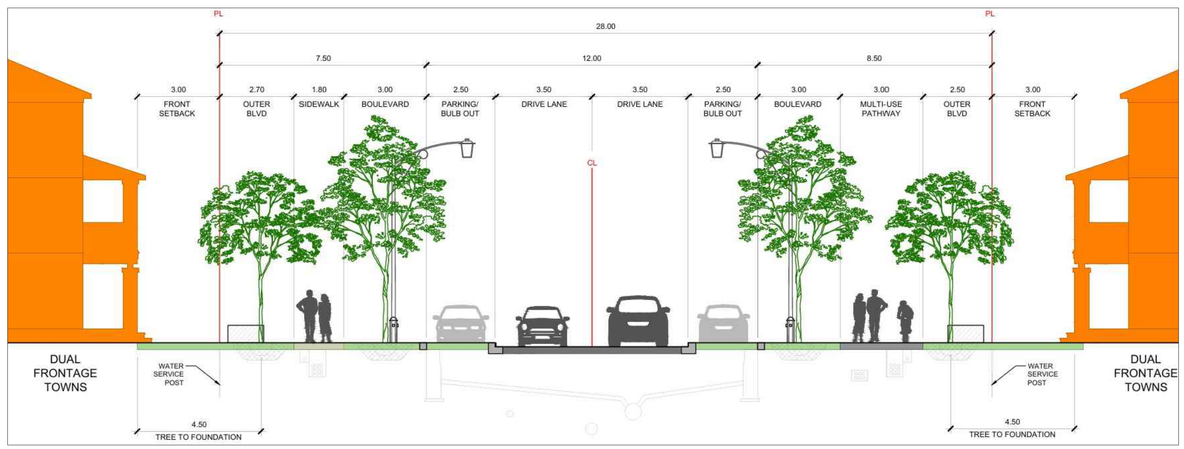
LEGEND

- PROPOSED CURB LINES
- PROPOSED MULTI-USE PATH (3.0m)
- PROPOSED SIDEWALK (1.8m)

TURNING MOVEMENTS FOR HSU



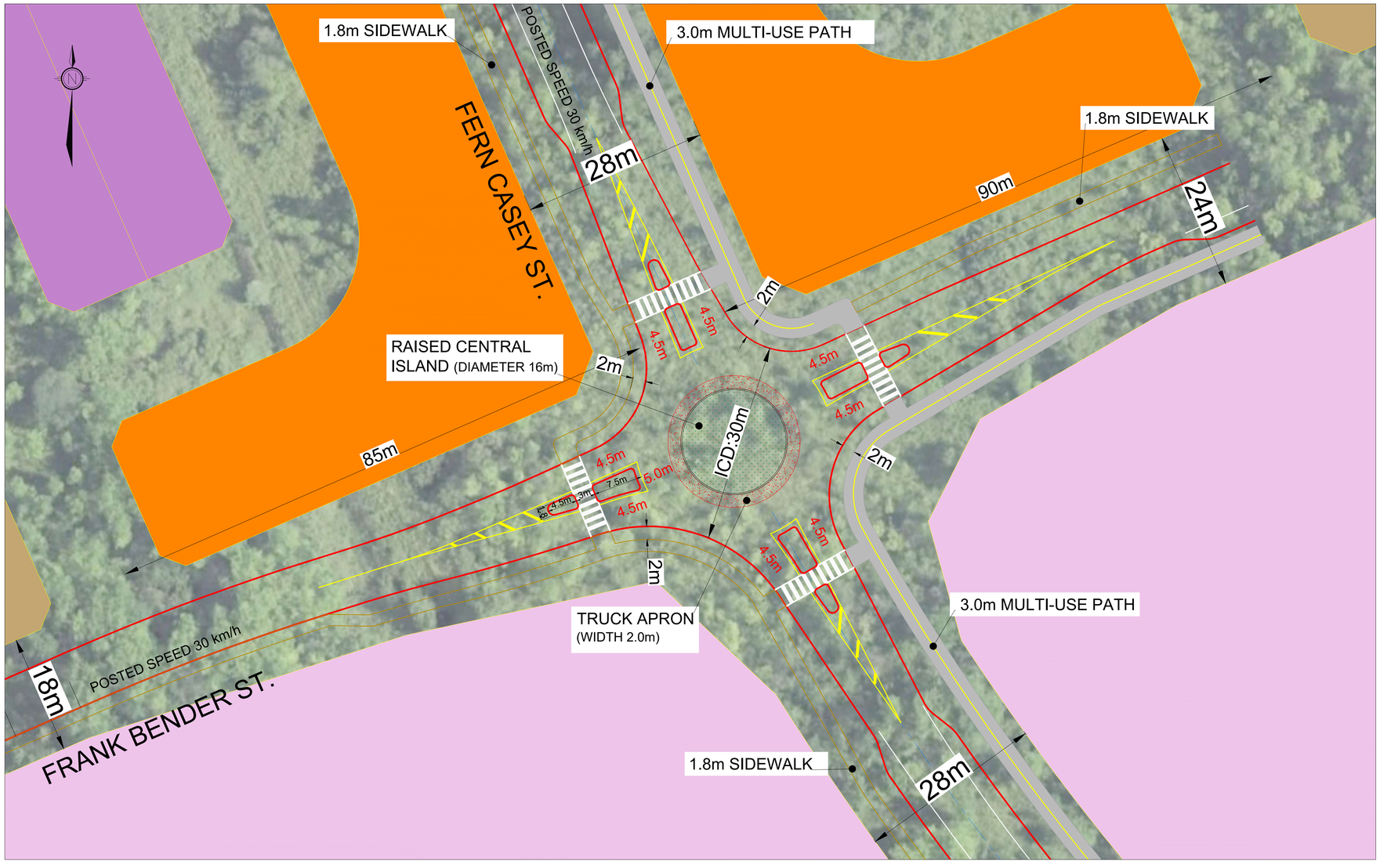
Heavy Single-Unit (HSU) Truck Dimensions



FERN CASEY STREET CROSS-SECTION

ATTACHMENT B-2:

ROUNDABOUT LAYOUT



CITY OF OTTAWA

PROPOSED ROUNDABOUT ON
FRANK BENDER ST. AND FERN CASEY ST.
LAYOUT PLAN

Castleglenn Consultants
Engineers, Project Managers & Planners

PROJECT REF. NUMBER: 7337

Contract No. 7337	Dwg. No.
Sheet 1 of 4	
Asset Group	
Des. A.P.	Chk'd.
Dwn. A.P.	Chk'd.
Utility Circ. No.	Index No.
Cost. Inspector	
Scale: 7m 0 7m HORIZ 1: 350	

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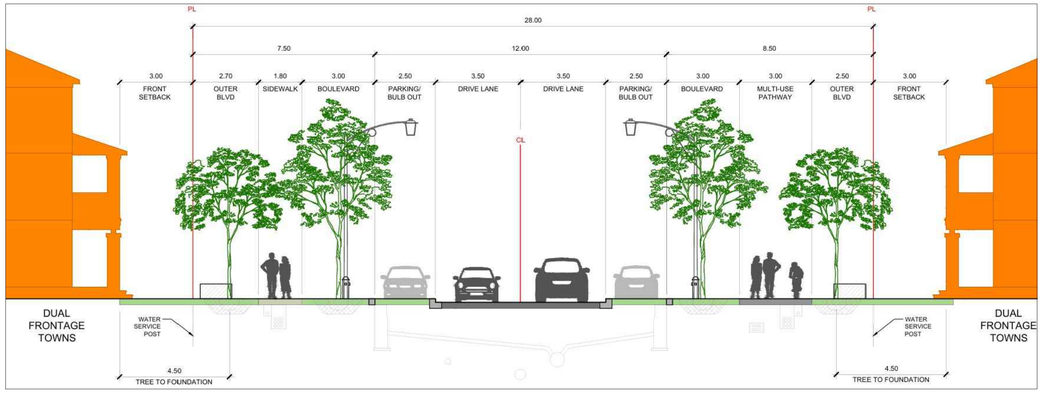
REVISIONS

No.	Description	By	Date (dd/mm/yy)
1	FOR INTERNAL REVIEW	A.P.	20/05/25
2			

LEGEND

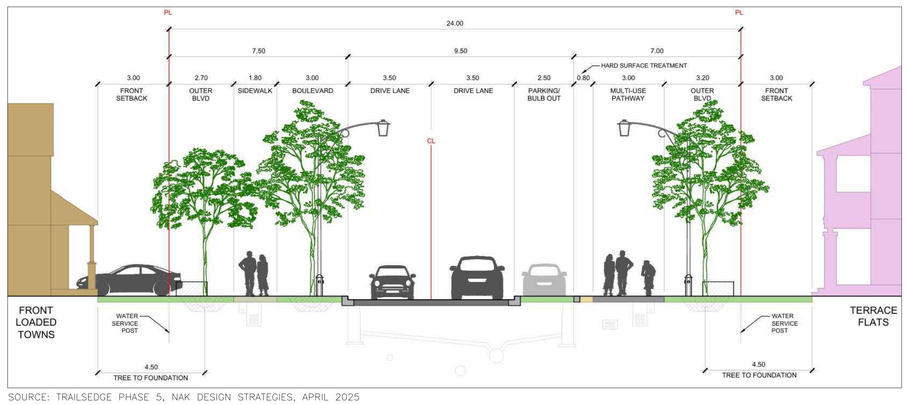
- PROPOSED CURB LINES
- PROPOSED MULTI-USE PATH (3.0m)
- PROPOSED SIDEWALK (1.8m)

NOTE: THIS ROUNDABOUT HAS BEEN DEVELOPED AT THE CONCEPTUAL LEVEL; SAFETY MEASURES SUCH AS FASTEST PATH ANALYSIS, ENTRY ANGLES, AND SIGHT DISTANCES STILL NEED TO BE ASSESSED TO ENSURE A PRACTICAL AND FUNCTIONAL DESIGN.



SOURCE: TRAILSEDGE PHASE 5, NAK DESIGN STRATEGIES, APRIL 2025

FERN CASEY STREET - 28m ROW



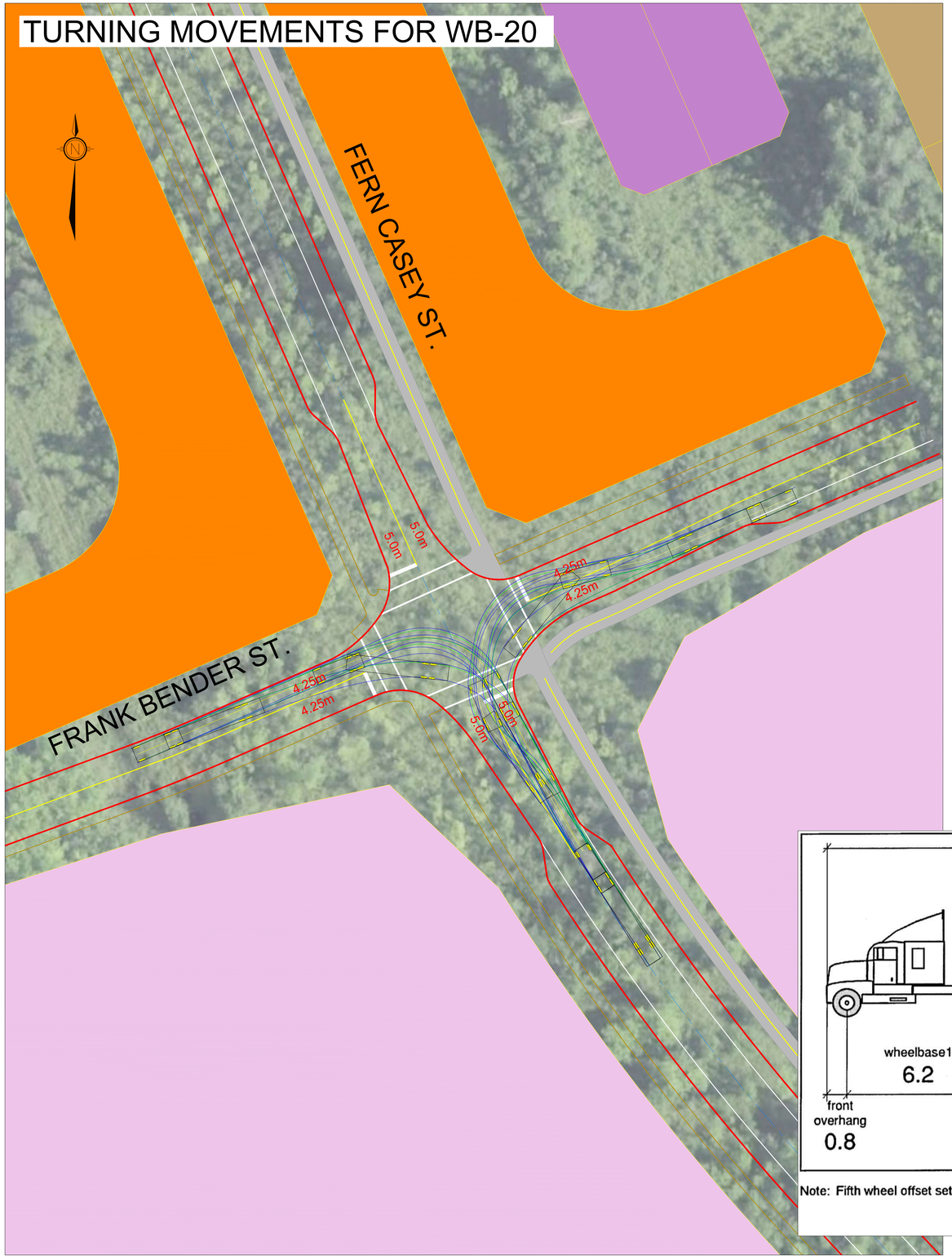
SOURCE: TRAILSEDGE PHASE 5, NAK DESIGN STRATEGIES, APRIL 2025

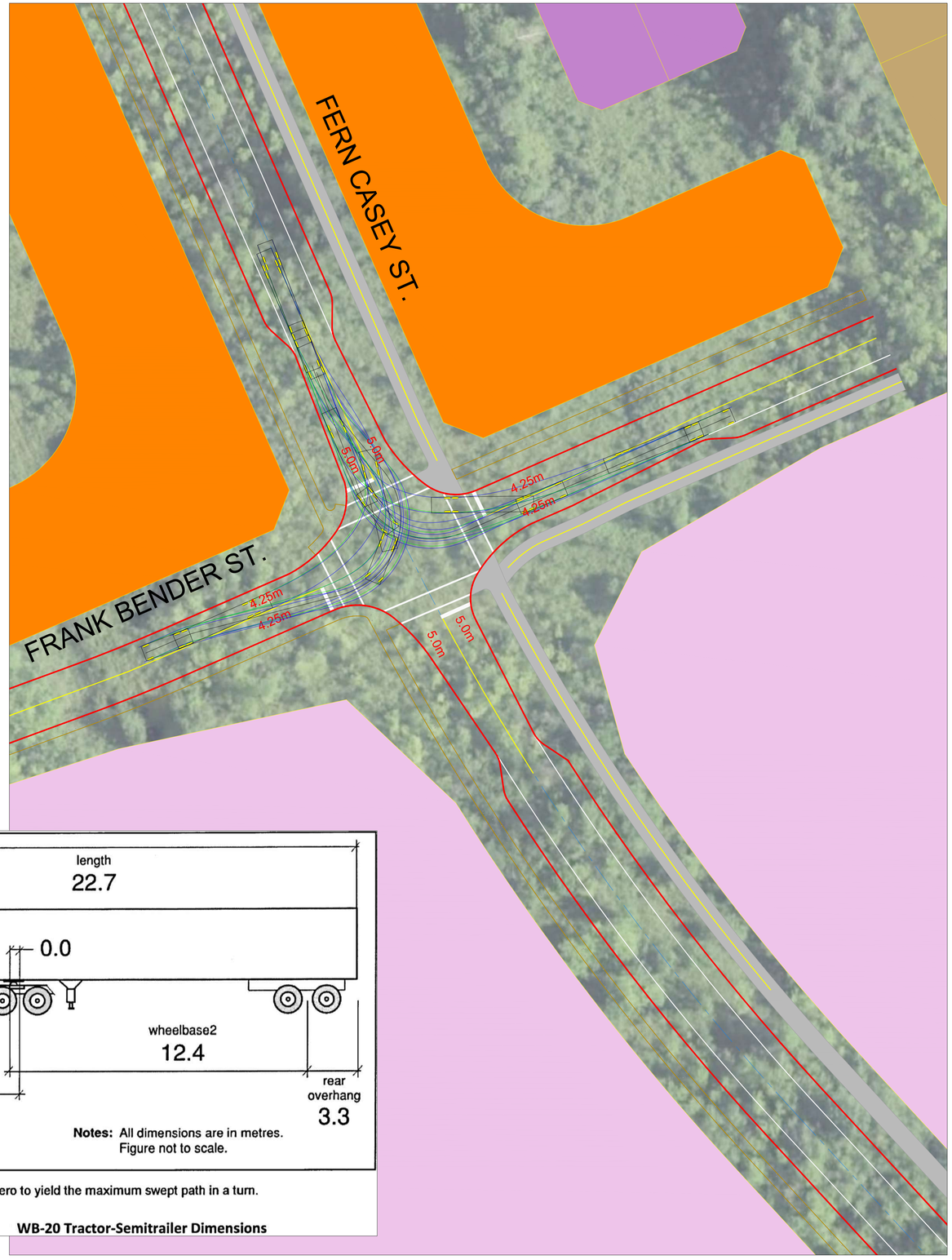
FRANK BENDER STREET - 24m ROW (EAST SIDE)

ATTACHMENT B-3:

AWSC WB-20 TURNING MOVEMENT DIAGRAM

TURNING MOVEMENTS FOR WB-20





Note: Fifth wheel offset set to zero to yield the maximum swept path in a turn.

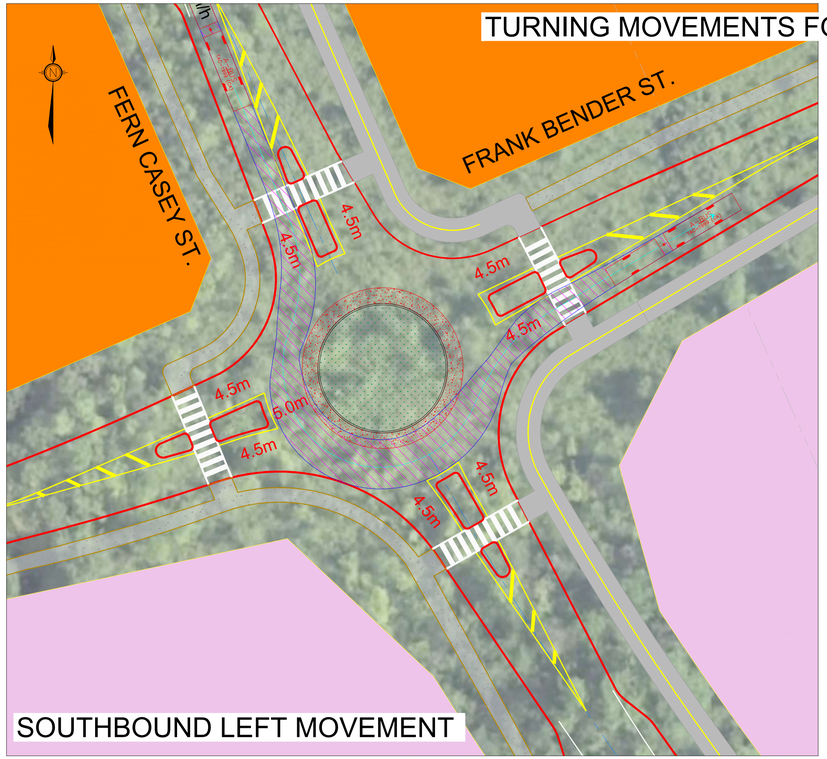
WB-20 Tractor-Semitrailer Dimensions

Attachment B-4:

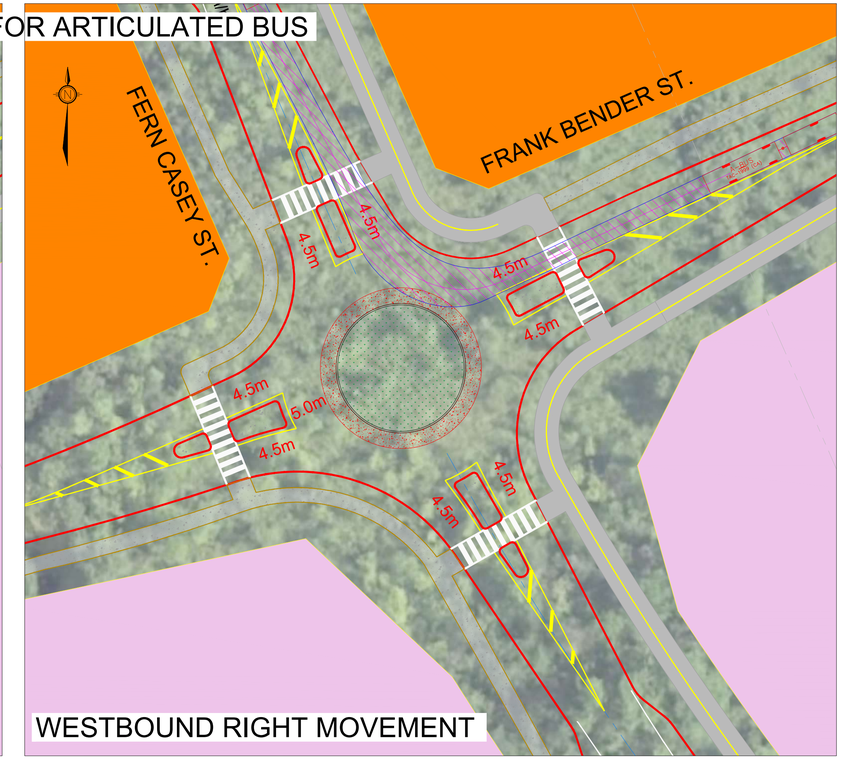
Roundabout Turning Movement Diagrams

- Articulated Buses (A-Bus)
- Standard Single Unit Bus (B-12)
- Heavy Single Unit Truck (HSU)
- Emergency Fire Truck

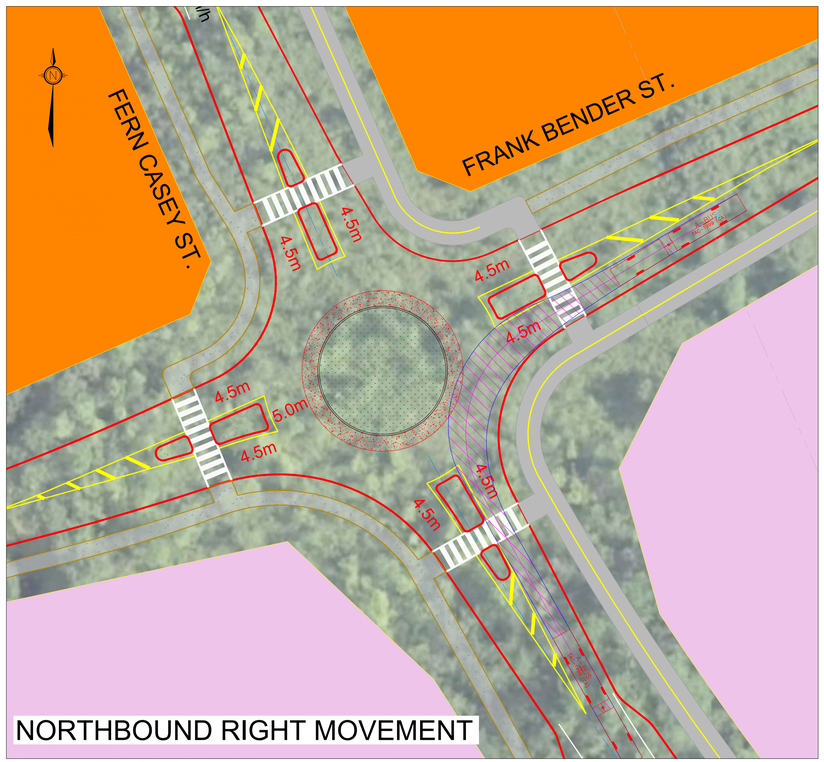
TURNING MOVEMENTS FOR ARTICULATED BUS



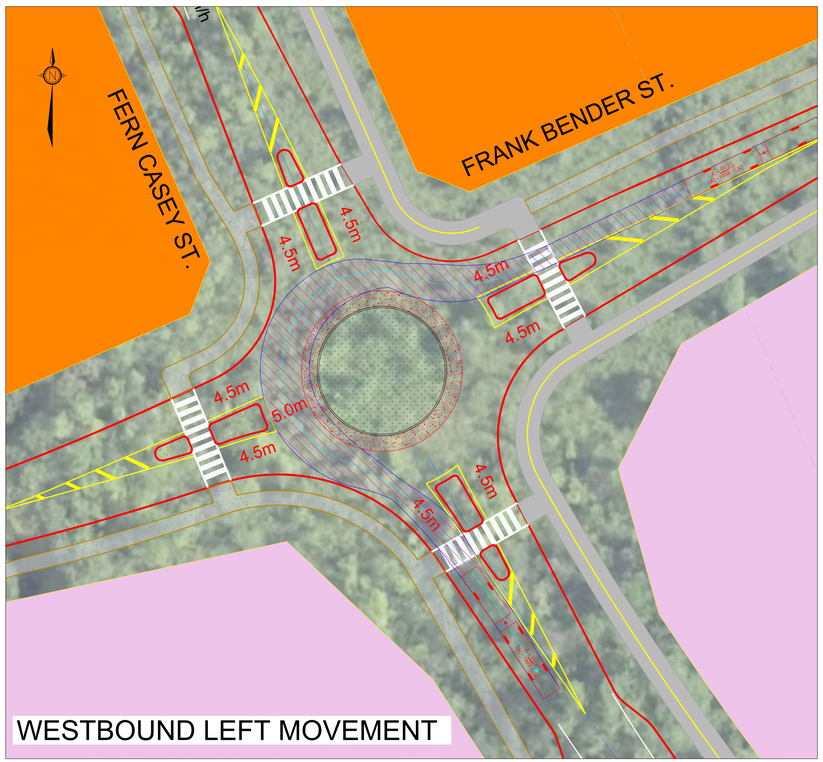
SOUTHBOUND LEFT MOVEMENT



WESTBOUND RIGHT MOVEMENT



NORTHBOUND RIGHT MOVEMENT



WESTBOUND LEFT MOVEMENT

CITY OF OTTAWA

PROPOSED ROUNDABOUT ON
FRANK BENDER ST. AND FERN CASEY ST.

ARTICULATED BUS TURNING MOVEMENTS

Castleglenn Consultants
Engineers, Project Managers & Planners

PROJECT REF. NUMBER: 7337

Contract No. 7337	Dwg. No.
Sheet 2 of 4	
Asset Group	
Des. A.P.	Chk'd.
Dwn. A.P.	Chk'd.
Utility Circ. No.	Index No.
Cost. Inspector	
Scale: 7m 0 7m HORIZ 1:350	

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REVISIONS

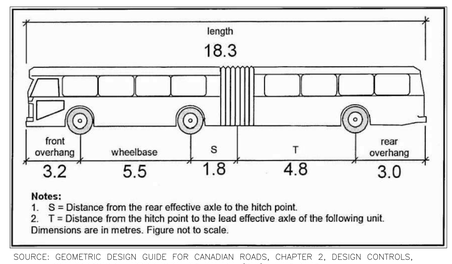
No.	Description	By	Date (dd/mm/yy)
1	FOR INTERNAL REVIEW	A.P.	16/05/25
2			

LEGEND

PROPOSED CURB LINES

PROPOSED MULTI-USE PATH (3.0m)

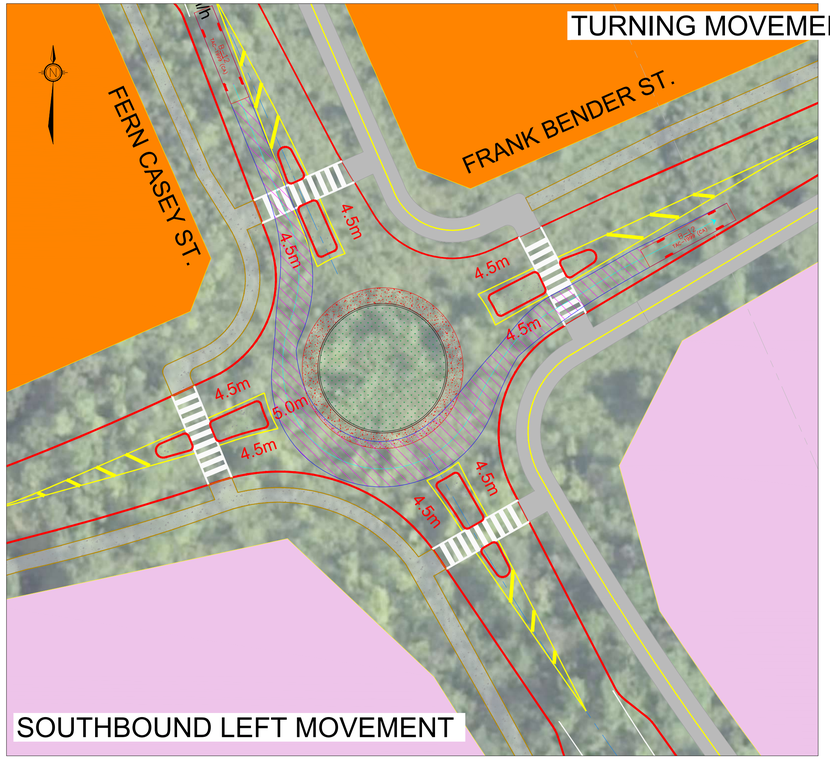
PROPOSED SIDEWALK (1.8m)



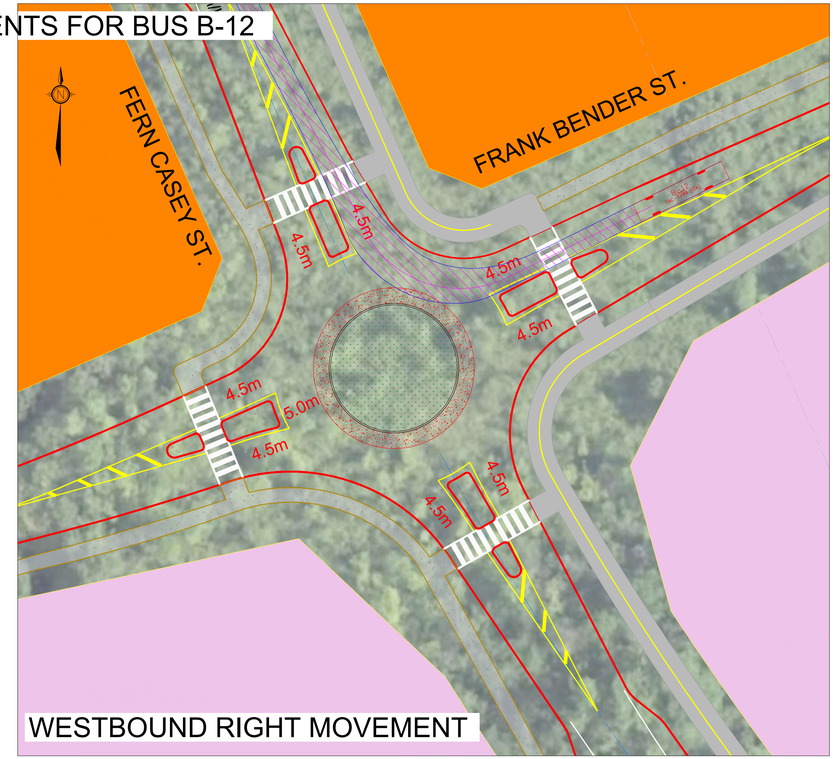
SOURCE: GEOMETRIC DESIGN GUIDE FOR CANADIAN ROADS, CHAPTER 2, DESIGN CONTROLS, TRANSPORTATION ASSOCIATION OF CANADA (TAC), JUNE 2017

Articulated Bus (A-BUS) Dimensions

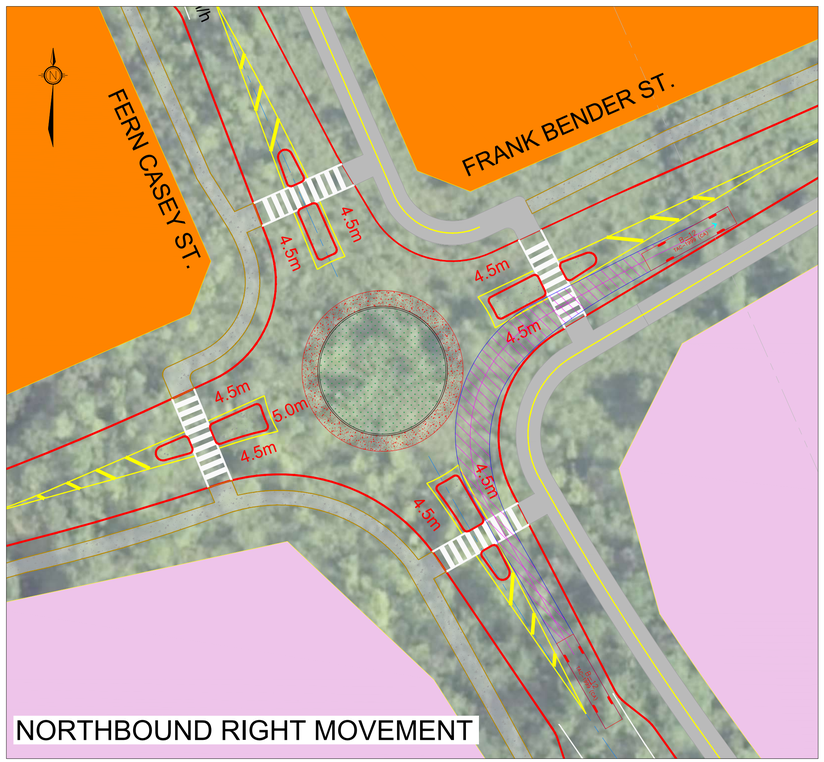
TURNING MOVEMENTS FOR BUS B-12



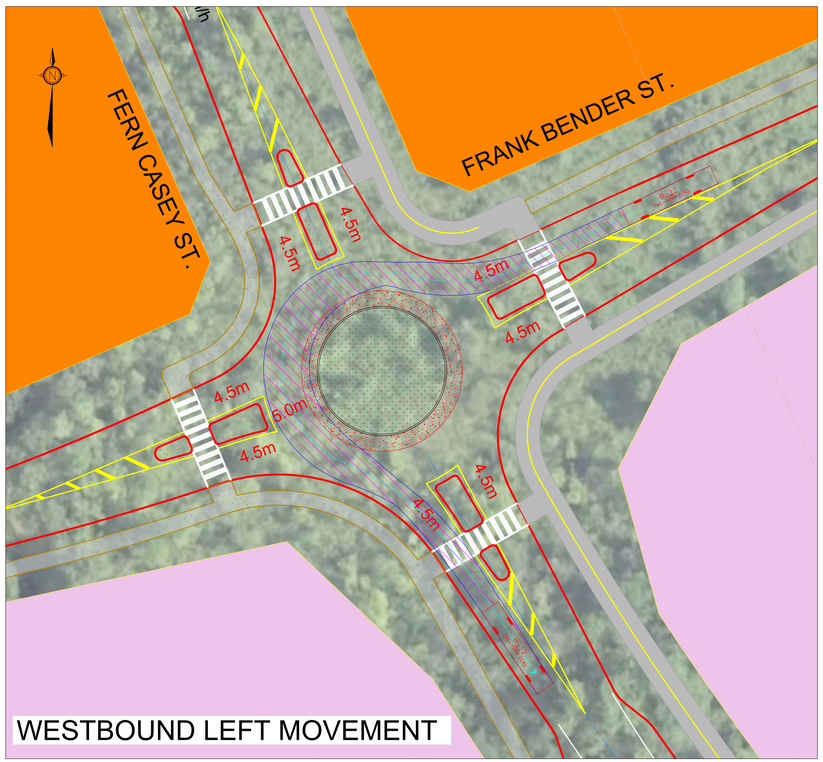
SOUTHBOUND LEFT MOVEMENT



WESTBOUND RIGHT MOVEMENT



NORTHBOUND RIGHT MOVEMENT



WESTBOUND LEFT MOVEMENT

CITY OF OTTAWA

PROPOSED ROUNDABOUT ON
FRANK BENDER ST. AND FERN CASEY ST.

STANDARD BUS B-12 TURNING MOVEMENTS

Castleglenn Consultants
Engineers, Project Managers & Planners

PROJECT REF. NUMBER: 7337

Contract No. 7337	Dwg. No.
Sheet 3 of 4	
Asset Group	
Des. A.P.	Chk'd.
Dwn. A.P.	Chk'd.
Utility Circ. No.	Index No.
Cost. Inspector	
Scale: 7m 0 7m HORIZ 1:350	

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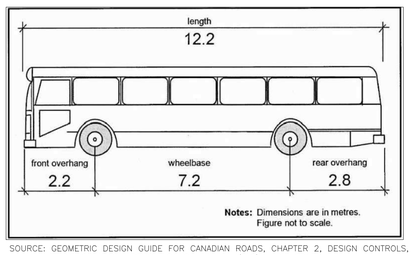
REVISIONS

No.	Description	By	Date (dd/mm/yy)
1	FOR INTERNAL REVIEW	A.P.	16/05/25
2			

LEGEND

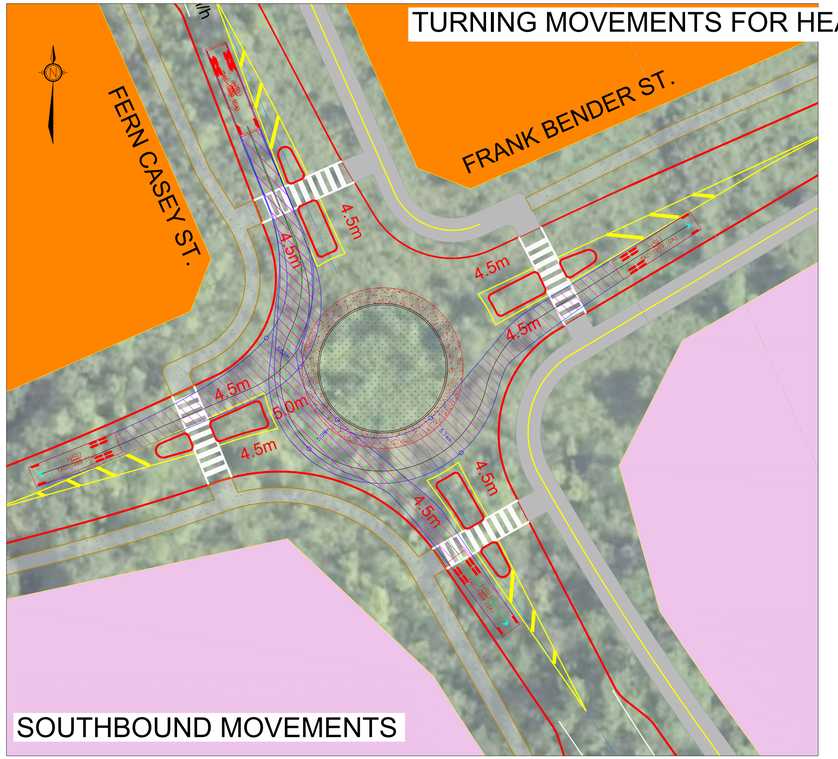
- PROPOSED CURB LINES
- PROPOSED MULTI-USE PATH (3.0m)
- PROPOSED SIDEWALK (1.8m)



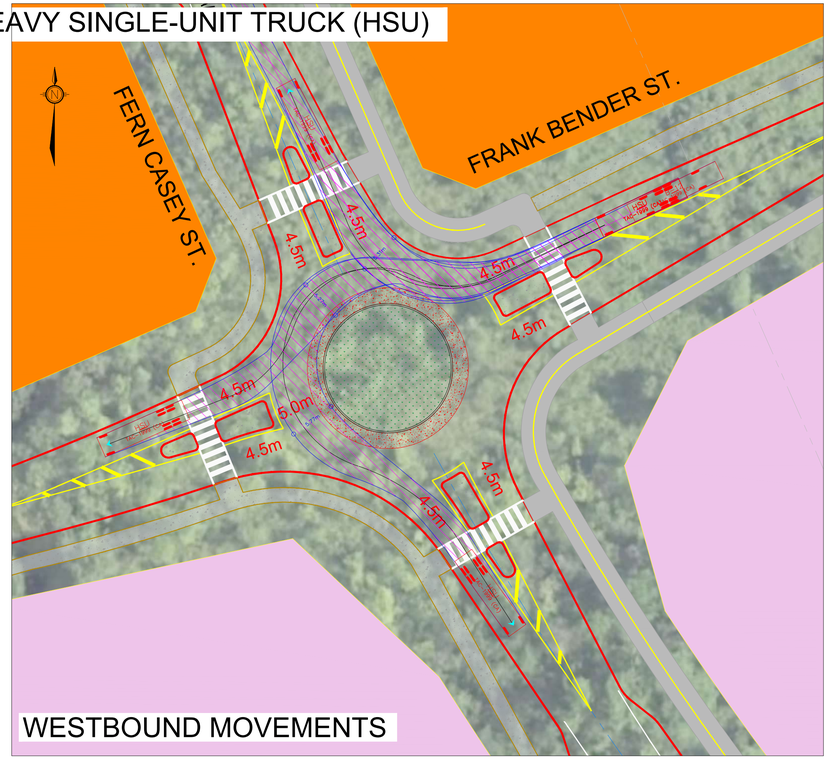
SOURCE: GEOMETRIC DESIGN GUIDE FOR CANADIAN ROADS, CHAPTER 2, DESIGN CONTROLS, TRANSPORTATION ASSOCIATION OF CANADA (TAC), JUNE 2017

Standard Single-Unit (B-12) Bus Dimensions

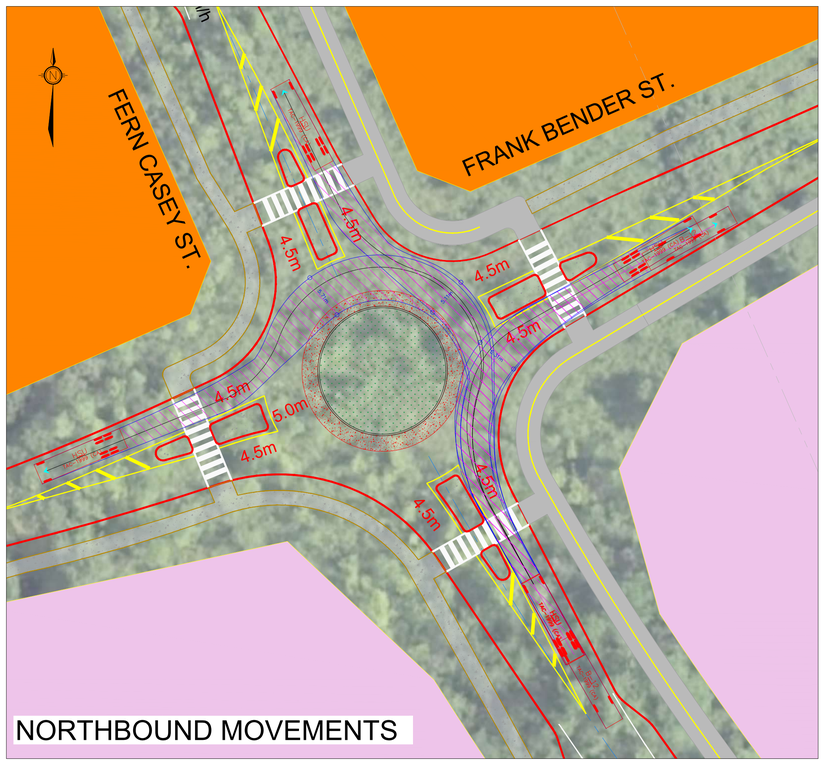
TURNING MOVEMENTS FOR HEAVY SINGLE-UNIT TRUCK (HSU)



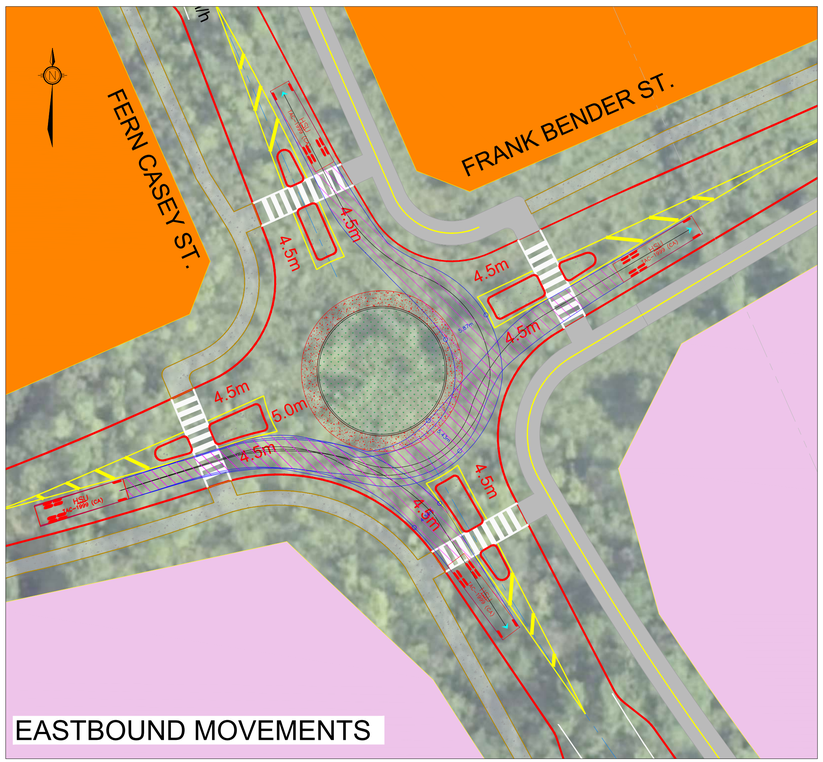
SOUTHBOUND MOVEMENTS



WESTBOUND MOVEMENTS



NORTHBOUND MOVEMENTS



EASTBOUND MOVEMENTS

CITY OF OTTAWA

PROPOSED ROUNDABOUT ON
FRANK BENDER ST. AND FERN CASEY ST.

HSU TURNING MOVEMENTS

Castleglenn Consultants
Engineers, Project Managers & Planners

PROJECT REF. NUMBER: 7337

Contract No. 7337	Dwg. No.
Sheet 4 of 4	
Asset Group	
Des. A.P.	Chk'd.
Dwn. A.P.	Chk'd.
Utility Circ. No.	Index No.
Cost. Inspector	
Scale: 7m 0 7m HORIZ 1:350	

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REVISIONS

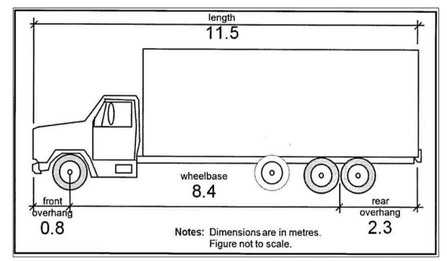
No.	Description	By	Date (dd/mm/yy)
1	FOR INTERNAL REVIEW	A.P.	16/05/25
2			

LEGEND

PROPOSED CURB LINES

PROPOSED MULTI-USE PATH (3.0m)

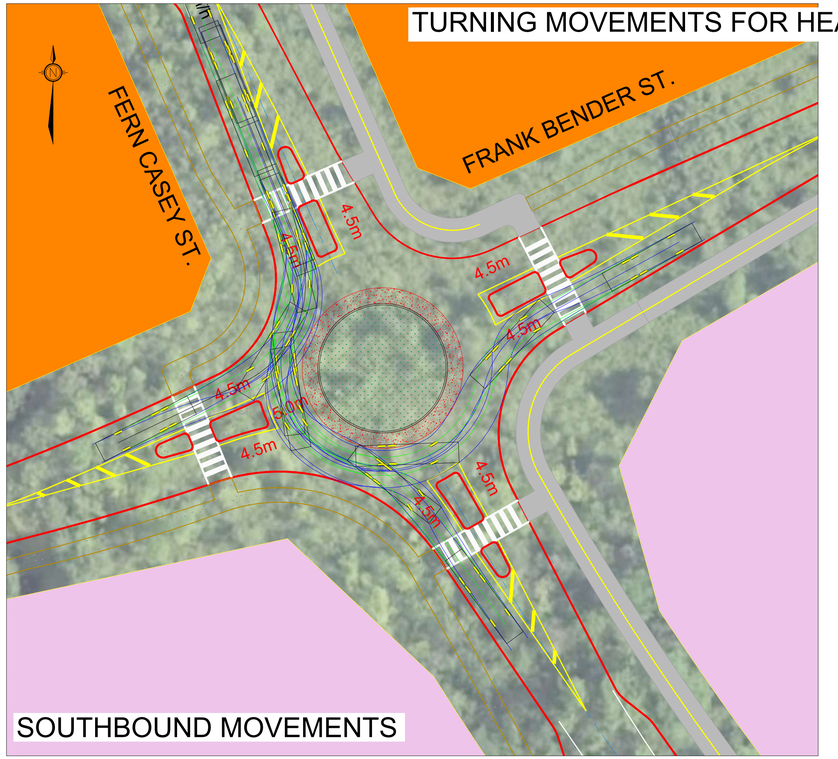
PROPOSED SIDEWALK (1.8m)



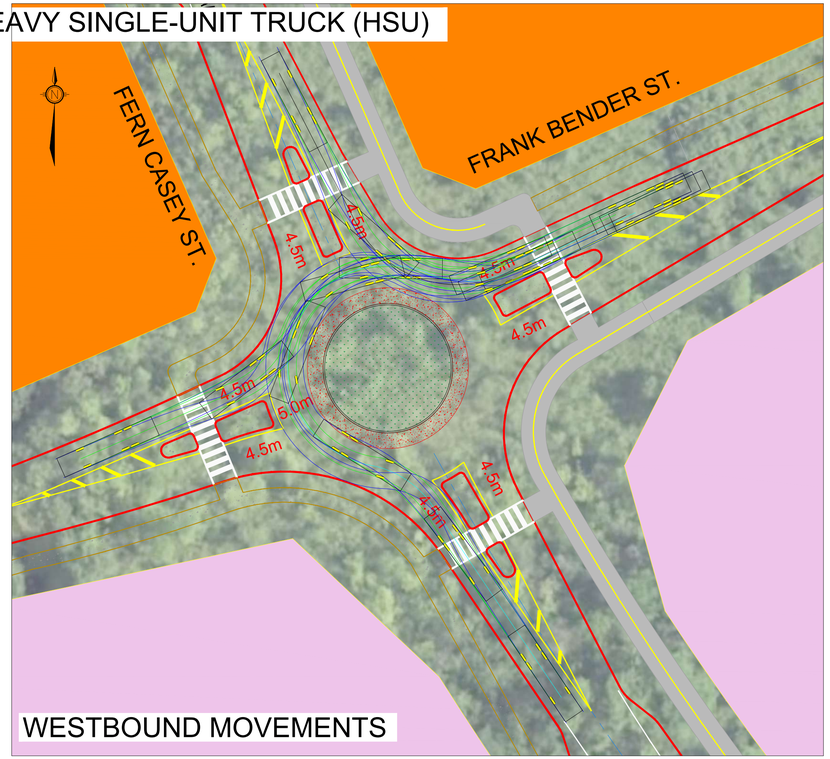
SOURCE: GEOMETRIC DESIGN GUIDE FOR CANADIAN ROADS, CHAPTER 2, DESIGN CONTROLS, TRANSPORTATION ASSOCIATION OF CANADA (TAC), JUNE 2017

HEAVY SINGLE-UNIT (HSU) TRUCK

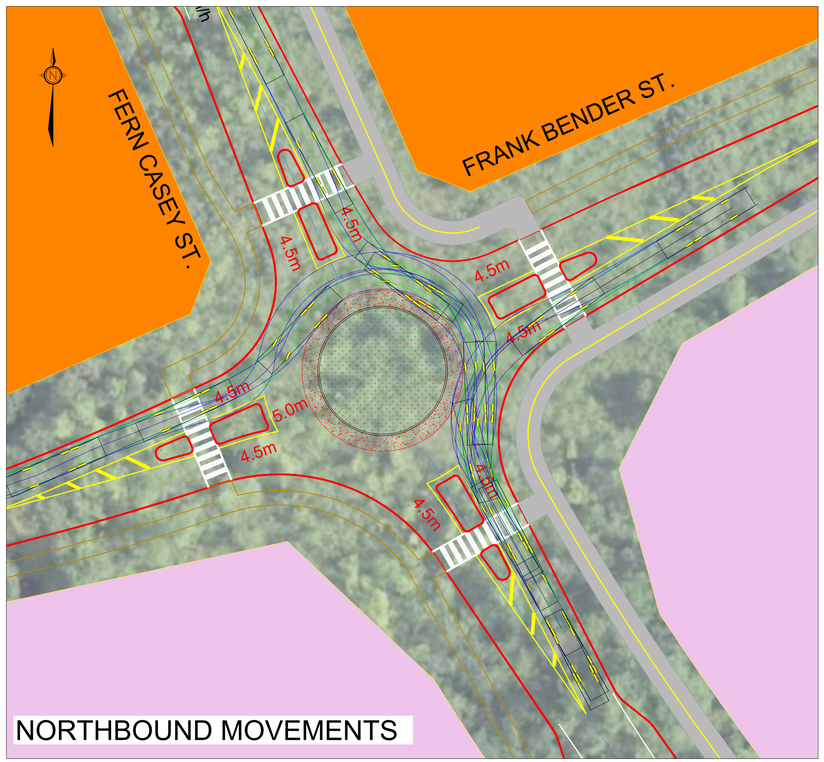
TURNING MOVEMENTS FOR HEAVY SINGLE-UNIT TRUCK (HSU)



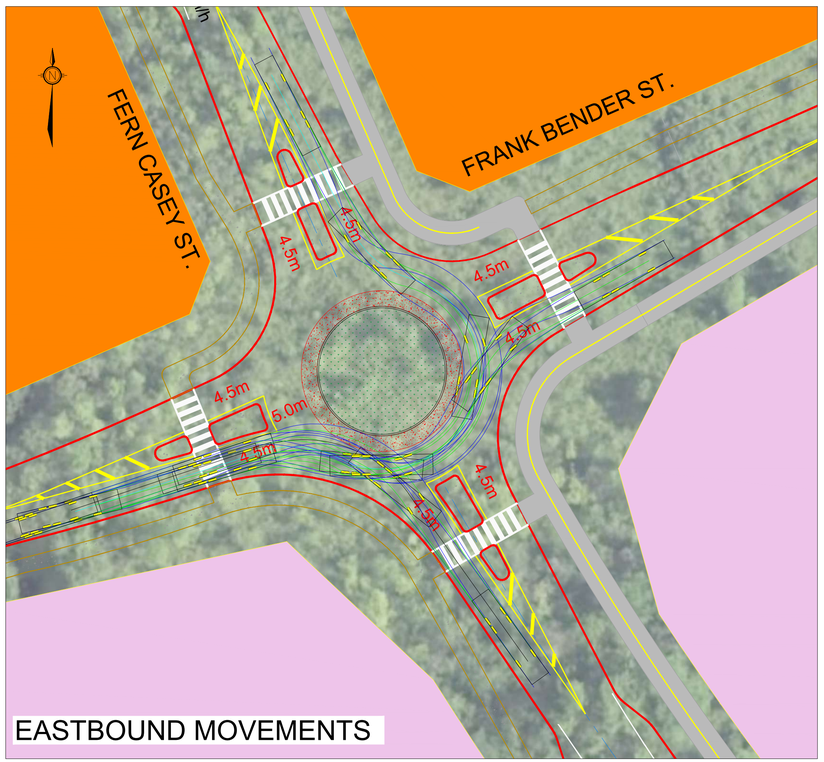
SOUTHBOUND MOVEMENTS



WESTBOUND MOVEMENTS



NORTHBOUND MOVEMENTS



EASTBOUND MOVEMENTS

CITY OF OTTAWA

PROPOSED ROUNDABOUT ON
FRANK BENDER ST. AND FERN CASEY ST.

FIRETRUCK TURNING MOVEMENTS

Castleglenn Consultants
Engineers, Project Managers & Planners

PROJECT REF. NUMBER: 7337

Contract No. 7337	Dwg. No.
Sheet 5 of 5	
Asset Group	
Des. A.P.	Chk'd.
Dwn. A.P.	Chk'd.
Utility Circ. No.	Index No.
Cost. Inspector	
Scale: 7m 0 7m HORIZ 1:350	

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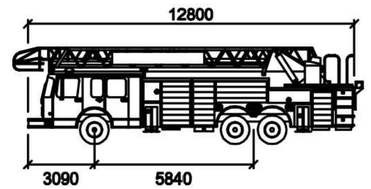
REVISIONS

No.	Description	By	Date (dd/mm/yy)
1	FOR INTERNAL REVIEW	A.P.	16/05/25
2			

LEGEND

- PROPOSED CURB LINES
- PROPOSED MULTI-USE PATH (3.0m)
- PROPOSED SIDEWALK (1.8m)



Aerial Fire

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

SOURCE: CURB RADII GUIDELINE, CITY OF TORONTO, TRANSPORTATION SERVICES, JUNE 2017

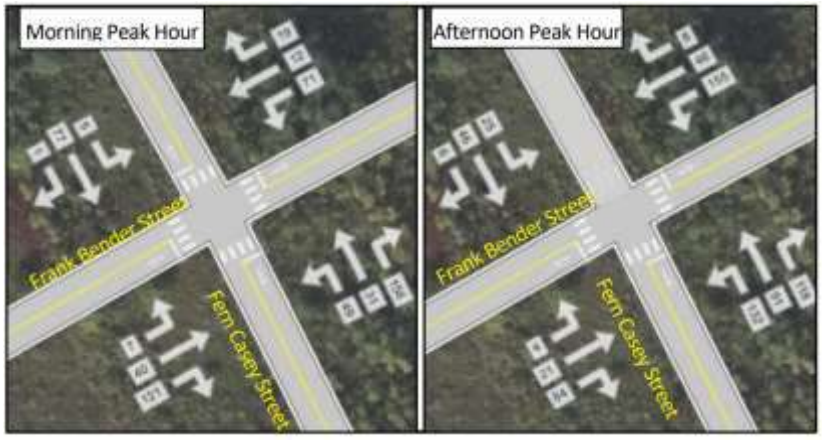
FIRETRUCK DIMENSIONS

ATTACHMENT C:

ROUNDABOUT SCREENING TOOL

City of Ottawa
Roundabout Initial Feasibility Screening Tool

The intent of this screening tool is to provide a relatively quick assessment of the feasibility of a roundabout at a particular intersection in comparison to other appropriate forms of traffic control or road modifications including all-way stop control, traffic signals, auxiliary lanes, etc. The intended outcome of this tool is to provide enough information to assist staff in deciding whether or not to proceed with an Intersection Control Study to investigate the feasibility of a roundabout in more detail.

1 Project Name:	Trailsedge Phase 5
2 Intersection:	Future Fern Casey Road / Frank Bender Street intersection
3 Location and Description of Intersection: Lane configuration, total or approach AADT, distance to nearby intersection(s), etc. Attach or sketch a diagram and include existing and/or horizon-year turning movements. If an existing intersection then indicate type of control.	The Fern Casey Road / Frank Bender Street intersection is 4-leg intersection located in the proposed Trailsedge Phase 5 commuity. This subdivisionis located south of Innes Road, north of Brian Coburn Boulevard and west of Mer-Bleue Road in Orleans. The future Fern Casey Road / Frank Bender Street intersection located 320m north of the Brian Coburn Blvd./Fern Casey Road roundabout. Below are the 2046 forecast turning movements. 
4 What traditional modifications are proposed? All-way stop control, traffic signals, auxiliary lanes, etc. Attach or sketch a diagram if necessary.	An all-way stop control is also being proposed. *Sketch is included with report above under Attachment "B-1"*
5 What size of roundabout is being considered? Describe, and attach a Roundabout Traffic Flow Worksheet.	A mini-roundabout is being considered with an inscribed circle diameter (ICD) of 25 meters. The single circulating lane has a width of 6 meters. *Sketch is included with report above under Attachment "B-2"*

6 Why is a roundabout being considered?

This is the southern entrance to the future Trailsedge Phase 5 subdivision from Brian Coburn Boulevard

7 Are there contra-indications for a roundabout?

If "Yes" is indicated for one or more of the contra-indications then a roundabout may be problematic at the subject intersection. That is not to say that a roundabout is not possible, just that there may be difficulties or high costs.

No.	Contra-Indication	Outcome
1	Are there any instances where stopping sight distance (SSD) of a roundabout yield line may not be attainable (i.e. the intersection is on a crest vertical curve)?	Yes ☐ No ■
2	Is there an existing uncontrolled approach with a grade in excess of 4 percent?	Yes ☐ No ■
3	Is the intersection located within a coordinated signal system?	Yes ☐ No ■
4	Is there a closely-spaced traffic signal or railway crossing that could not be controlled with a nearby roundabout?	Yes ☐ No ■
5	Are there known visually-impaired pedestrians that cross this intersection?	Yes ☐ No ■

8 Are there suitability factors for a roundabout?

If "Yes" is indicated for two or more of the suitability factors then a roundabout should be technically feasible at the subject intersection.

No.	Suitability Factor	Outcome
1	Does the intersection currently experience an average collision frequency of more than 1.5 injury crashes per year, or a collision rate in excess of 100 injury crashes per 100 million vehicles entering (MVE)?	Yes ☐ No ■
2	Has there been a fatal crash at the intersection in the last 10 years?	Yes ☐ No ■
3	Are capacity problems currently being experienced, or expected in the future?	Yes ☐ No ■
4	Are traffic signals warranted, or expected to be warranted in the future?	Yes ☐ No ■
5	Is there sufficient property at the intersection (i.e. over 50 metres clear diameter if considering a single-lane roundabout, and over 65 metres clear diameter if considering a two-lane roundabout)?	Yes ■ No ☐
6	Does the intersection have more than 4 legs, or unusual geometry?	Yes ☐ No ■
7	Will planned modifications to the intersection require that nearby structures be widened (i.e. to accommodate left-turn lanes)?	Yes ☐ No ■
8	Is the intersection located at a transition between rural and urban environments (i.e. an urban boundary) such that a roundabout could act as a means of speed transition?	Yes ■ No ☐

9	Conclusions/recommendation whether to proceed with an Intersection Control Study:	The future Fern Casey Road / Frank Bender Street intersection is being examined as both an All Way Stop Controlled intersection and as a roundabout.