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April 20, 2015

Reimer Properties
c/o Mr. Keith Riley
Project Manager
Argue Construction Ltd.
105-A Willowlea Road
Carp, Ontario
K0A 1L0

Dear Mr. Riley:

1599 ST. LAURENT BOULEVARD
TRANSPORTATION OVERVIEW

Introduction

The following is a Transportation Overview of a proposed truck terminal at 1599 St. Laurent Boulevard which is being developed by Reimer Properties and will serve as a cross docking facility for Apex Motor Express Ltd. The subject property is located at 1599 St. Laurent Boulevard but will be accessed solely from Triole Street. It is our understanding that Site Plan Control Approval is being sought from the City of Ottawa for the development proposal.

The City of Ottawa has confirmed that a Transportation Overview is required as part of the Development Application. In particular, the City has indicated that the following information is to be included in the study:

- An estimate of projected site generated traffic.
- An assessment of the impact to non-auto modes.
- A review of truck turning movements at the Belfast Road and Triole Street intersection.

The Transportation Overview will also include a review of the existing transportation network within the study area with a particular focus on the existing intersection of Belfast Road and Triole Street.

Proposed Development

The proposed development is located within the Newmarket-Cyrville Industrial Area on vacant land bounded by: St. Laurent Boulevard to the west; the existing properties along Triole Street to the north; the existing properties along Michael Street to the east; and an abandoned railway corridor to the south. The property is split into two parcels: a west parcel that is zoned for General Industrial land use, and an east parcel that is zoned for Light Industrial land use. The location of the proposed development is indicated on **Exhibit 1**. The development will be located on the east parcel of land and includes a building consisting of 19,000 sq. ft. of warehouse

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Exhibit 1 – Site Location

space and 3,000 sq. ft. of attached offices. The warehouse will accommodate 40 loading docks and the site will also provide the following surface parking spaces:

- 28 general parking spaces
- 17 tractor parking spaces
- 17 trailer parking spaces

Access to the site is proposed from Triole Street via a private approach at the south terminus of the street. The private approach is proposed as a 6.7 m wide asphalt roadway.

The cross docking facility will be surrounded by security fences with sliding gates to allow access for trucks. The general parking spaces are proposed in an area outside of the security fences.

A site plan indicating details of the development is included in **Appendix A**.

Existing Conditions

Road Network

St. Laurent Boulevard is a north-south arterial road under the jurisdiction of the City of Ottawa. The section of St. Laurent Boulevard between Smyth Road and Montreal Road has a four-lane divided cross-section and is designated as a truck route. St. Laurent Boulevard is an important arterial road in the City and provides connections to Provincial Highway 417 and major east-west arterial roads, including: Innes Road, Industrial Avenue, Ogilvie Road and Montreal Road.

Triole Street is a two-lane local road with an average pavement width of 7.8 m.

Belfast Road (east of St. Laurent Boulevard) is a two-lane local road with a pavement width of 11 m. Belfast Road is also designated as a truck route.

The intersection of Belfast Road and Triole Street is unsignalized with stop control on the Triole Street approaches and free flow conditions on Belfast Road.

Pedestrian and Cycling Facilities

A continuous concrete sidewalk is provided along the south side of Belfast Road between St. Laurent Boulevard and Michael Street. A concrete sidewalk is provided long the north side between St. Laurent Boulevard and Triole Street.

There are no formal pedestrian facilities provided along Triole Street.

There are no formal cycling facilities along either Belfast Road or Triole Street within the study area.

Transit Service

The following transit routes are within 400 m walking distance from the proposed development:

- Route 114 is a regular bus route providing all-day transit service between the Greenboro Transitway station and Hurdman Transitway station via the South Keys and Greenboro neighbourhoods, Conroy Road, St. Laurent Boulevard and the Transitway. The nearest bus stops serving Route 114 are located at the intersection of St. Laurent Boulevard and Belfast Road.
- Route 192 is a peak period bus route providing service between Hurdman Transitway station and the Newmarket-Cyrville, Sheffield and Hawthorne-Stevenage Industrial Areas. The nearest bus stops serving Route 192 are located at the intersection of Belfast Road and Michael Street.

Copies of the detailed OC Transpo route maps for each of the bus routes noted above are provided in **Appendix B**.

Collision Records

Collision records for the Belfast Road/Triole Street intersection have been reviewed for the period between January 1, 2011 and January 1, 2014. The City of Ottawa Transportation Impact Assessment Guidelines indicate that further analysis may be warranted when there have been either 33 or more total collisions reported at a particular location, or at least 6 collisions of a particular type, over a three year period.

A total of three collisions were recorded during the three-year period. The collisions occurred between vehicles and resulted in property damage only. No pedestrians or cyclists were involved in the collisions.

Based on the above, there do not appear to be any significant safety issues at the Belfast Road/Triole Street intersection.

Existing (2014) Traffic

Representative peak period traffic volumes at the Belfast Road/Triole Street intersection have been established based on data recorded at the intersection on Thursday, September 19, 2014. The morning peak hour occurs from 7:30 a.m. to 8:30 a.m. while the afternoon peak hour is from 4:00 p.m. to 5:00 p.m.

The existing weekday morning and afternoon peak hour traffic volumes are presented in **Exhibit 2** below. **Exhibit 3** presents the existing heavy vehicle volumes during the peak hours and the percentage of total traffic that they represent.

Exhibit 2 – Existing (2014) Traffic

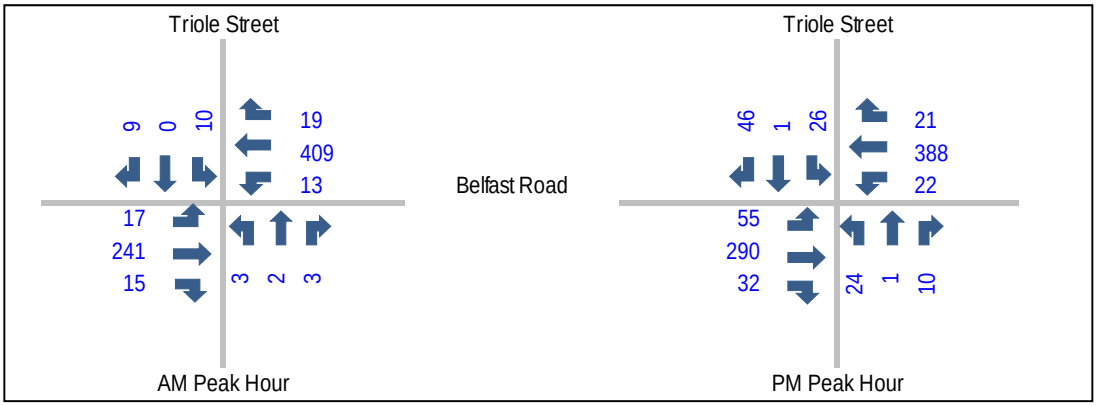
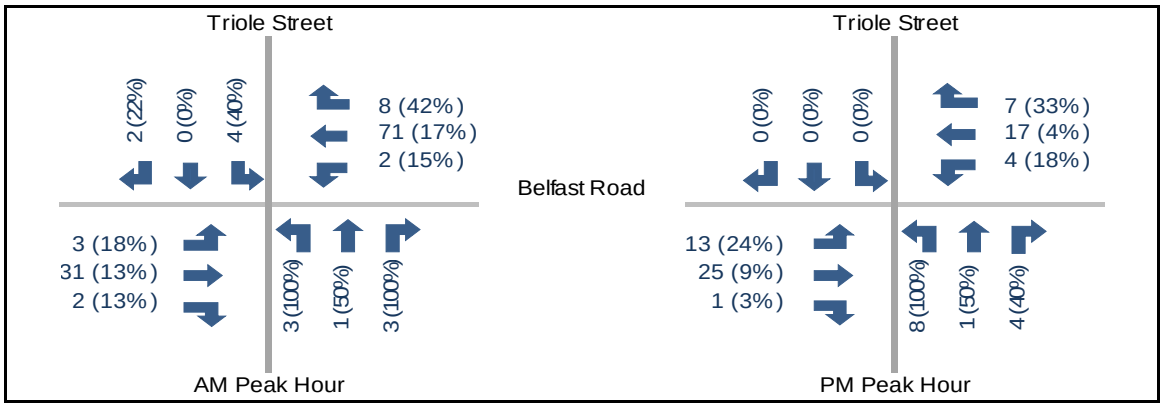


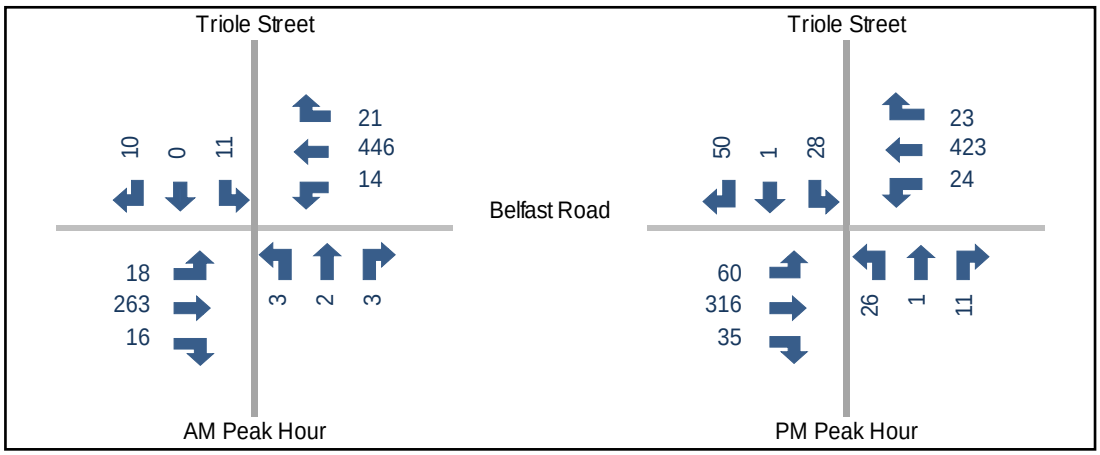
Exhibit 3 – Existing (2014) Heavy Vehicle Volumes (Percentages)



Future (2020) Background Traffic

The horizon year for the analysis is 2020, representing 5 years beyond the anticipated opening year of the facility. Future background traffic volumes at the horizon year have been established by applying a 1.5% annual traffic growth rate to the existing (2014) traffic volumes. This growth rate was first established in the *Apex Motors Express Cross Dock Terminal Transportation Impact Study*, prepared by National Capital Engineering in 2006, as part of a previous development application for the site. **Exhibit 4** presents the future (2020) background traffic volumes.

Exhibit 4 – Future (2020) Background Traffic



Site Generated Traffic

Estimates of traffic generated by the proposed development have been based on information provided by Apex Motor Express Limited. Traffic generated by the facility will consist of employee trips and truck trips. Employee trips include truck drivers, dock staff and office staff arriving to and leaving from the facility in their personal vehicles. Truck trips will be made up of pickup and delivery (P&D) trips to destinations within the City and long line truck trips to/from other cities. The P&D trips will be made by a combination of Single-Unit (MSU/HSU) trucks and tractor semi-trailer trucks with a maximum trailer length of 53 feet. The line haul trips will be made by tractor semi-trailer only. It is intended that the majority of truck trips will take place outside of the peak hours. The bulk of inbound deliveries will occur between the hours of 12:00 a.m. and 6:00 a.m., while most of the outbound deliveries will occur between 5:30 p.m. and 8:00 p.m. It is anticipated that only minimal deliveries will take place during regular business hours during the day.

Table 1 presents a summary of the estimated peak hour and total daily trips that are expected to be generated by the facility.

Table 1: Trip Generation

TRIP TYPE	TRIP GENERATION (VEHICLES)						
	TOTAL DAILY TRIPS (TWO-WAY)	AM PEAK HOUR			PM PEAK HOUR		
		TOTAL	IN	OUT	TOTAL	IN	OUT
Employees (Personal Vehicles)	64	10	9	1	6	0	6
Trucks (Pickup and Delivery)	80	3	0	3	10	10	0
Trucks (Line Haul)	30	1	1	0	-	-	-
Total	**174**	**14**	**10**	**4**	**16**	**10**	**6**

Based on the above, it is anticipated that the proposed cross-docking facility will generate 174 total daily trips.

A total of 14 new trips (10 vehicles entering and 4 vehicles exiting) and 16 new trips (10 vehicles entering and 6 vehicles exiting) are estimated to be generated by the facility during the weekday morning and afternoon peak hours, respectively. Of these, it is estimated that 4 trips in the morning peak hour and 10 trips during the afternoon peak hour will be truck trips. These will be primarily P&D trips made by Single Unit trucks.

The site generated traffic volumes have then been added to the future (2020) background traffic volumes in exhibit 4 to establish the total traffic volumes at 2020.

It has been assumed that traffic generated by the site will travel according to the following distribution:

- To/from the west 70%
- To/from the east 30%

The total traffic volumes are indicated in **Exhibit 5** below. **Exhibit 6** presents the future heavy vehicle volumes and percentages.

Exhibit 5 – Future (2020) Total Traffic

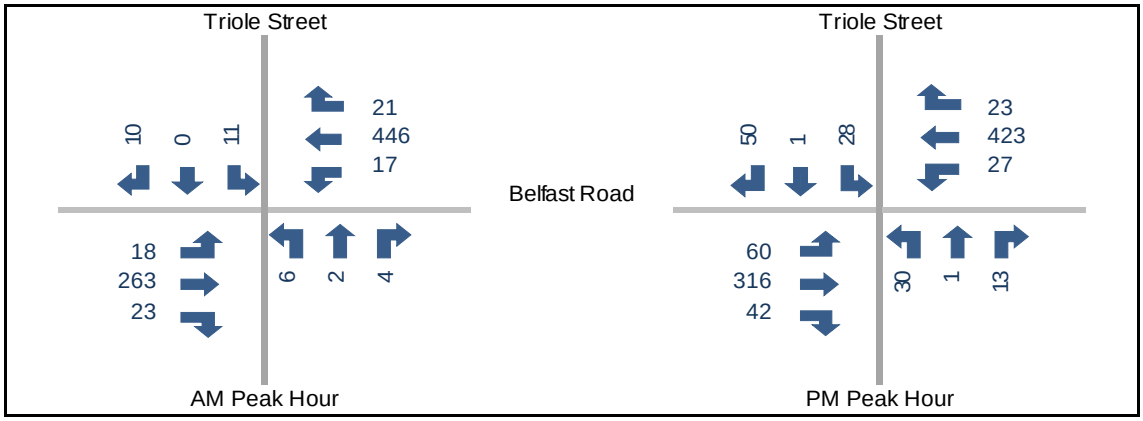
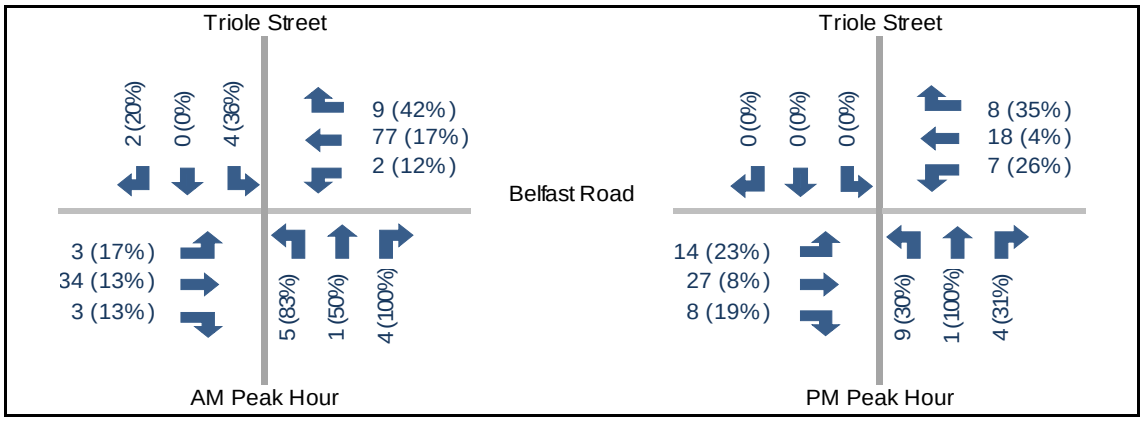


Exhibit 6 – Future (2020) Heavy Vehicle Volumes and Percentages



Intersection Capacity Analysis

Intersection capacity analysis has been undertaken for the Belfast Road/Triole Street intersection under 2014, 2020 background and 2020 total traffic conditions using Synchro Version 7 software.

The capacity of an unsignalized intersection can be expressed in terms of the "Level of Service" it provides. For an unsignalized intersection, the Level of Service is defined in terms of the average movement delays at the intersection. This is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line, this includes the time required for a vehicle to travel from the last–in–queue position to the first–in–queue position. The average delay for any particular minor movement at the unsignalized intersection is a function of the capacity of the approach and the degree of saturation.

The Highway Capacity Manual 2010 (HCM2010), prepared by the Transportation Research Board, includes Levels of Service criteria for unsignalized intersections related to average movement delays at the intersection, as indicated in **Table 2**.

Table 2: Level of Service Criteria – Unsignalized Intersections

LEVEL OF SERVICE	DELAY (S)
A	<10
B	>10 and <15
C	>15 and <25
D	>25 and <35
E	>35 and <50
F	>50

The unsignalized intersection capacity analysis technique included in the HCM and used in the current study provides an indication of the Level of Service for each movement of the intersection under consideration. By this technique, the performance of the unsignalized intersection can be compared under varying traffic conditions, using the Level of Service concept in a qualitative sense. One unsignalized intersection can be compared with another unsignalized intersection using this concept. Level of Service "E" represents the capacity of the movement

under consideration and generally, in large urban areas, Level of Service “D” is considered to represent an acceptable operating condition (Level of Service “E” is considered an acceptable operating condition for planning purposes for intersections located in Ottawa’s Urban Core— the downtown and its vicinity). Level of Service “F” indicates that the movement is operating beyond its design capacity.

Table 3 presents a summary of the results of the intersection capacity analysis undertaken for Belfast Road Triole Street intersection under existing and future traffic conditions. The analysis has incorporated the heavy vehicle proportions indicated in Exhibits 3 and 6 above.

Table 3: Intersection Capacity Analysis

TRAFFIC CONDITION	LEVEL OF SERVICE – NORTHBOUND APPROACH (DELAY)	
	AM PEAK HOUR	AM PEAK HOUR
Existing (2014) Traffic	C (17.8 s)	D (25.1 s)
Future (2020) Background Traffic	C(19.3 s)	D (29.6 s)
Future (2020) Total Traffic	C (20.2 s)	D (30.7 s)

The results of the intersection capacity analysis indicate that the Belfast Road/Triole Street intersection is presently operating at Level of Service “C” during the weekday morning peak hour and at Level of Service “D” during the afternoon peak hour. Under future background and total traffic conditions, the intersection will continue to operate at acceptable levels of service during the weekday peak hours.

Details of the analysis are provided in Appendix C

Truck Turning Movements

A review of truck turning movements at the intersection of Belfast Road and Triole Street has been undertaken using AutoTURN Version 8 software. Truck turning movements to/from Triole Street were simulated using the WB-20 design vehicle defined by the Transportation Association of Canada (TAC).

Exhibits showing the simulated truck turning movement paths are included in Appendix D.

Eastbound Right-Turn/Westbound Left-Turn

The truck turning simulations indicate that WB-20 trucks making the eastbound right turn or westbound left-turn on to Triole Street from Belfast Road can complete the movement within the existing pavement width provided, but will have to encroach on the northbound lane on Triole Street in order to complete the movement. This requirement may result in minor delays to trucks if there is a vehicle in the northbound lane waiting to enter the intersection. However, these conflicts are expected to be infrequent as there were only 8 vehicles and 35 vehicles, respectively, recorded on the northbound approach on Triole Street during the weekday morning and afternoon peak hours.

Northbound Left-Turn

WB-20 trucks making the northbound left-turn movement on Triole Street to then head west on Belfast Road toward St. Laurent Boulevard, can complete the movement within the width of pavement provided on Belfast Road and without encroaching on adjacent lanes.

Northbound Right-Turn

WB-20 trucks making the northbound right-turn movement on Triole Street to then head east on Belfast Road, can complete the movement within the width of pavement provided on Belfast Road, but will encroach on the opposing westbound lane in order to complete the movement. These occurrences are expected to be infrequent as the majority of truck trips will be to/from St. Laurent Boulevard.

Departure Sight Triangles – North Approach

The northbound left- and right-turn movements at the Belfast Road/Triole Street intersection will require sight lines of approximately 125 m. The existing trees/vegetation on the southwest corner of the intersection and along the south side of Belfast Road up to 30 m west of Triole Street should be cleared to ensure adequate sight lines.

A plan indicating the required departure sight lines is included in Appendix E.

Conclusion

Based on the above, the main findings and conclusions of this Transportation Overview are as follows:

- The intersection of Belfast Road/Triole Street is presently operating at acceptable levels of service during the weekday morning and afternoon peak hours.
- Based on the recorded collisions at the intersection during the 3-year period from 2011 to 2014, there do not appear to be any significant safety issues at the intersection
- The proposed development is estimated to generate 14 new trips during the weekday morning peak hour and 16 new trips during the afternoon peak hour. It is expected that most of the trips generated during the peak hours will be made by employees in their personal vehicles and deliveries by single-unit trucks. The majority of truck trips to/from the facility are expected to occur during off-peak hours in the evening and overnight.
- The Belfast Road/Triole Street intersection will continue to operate at acceptable levels of service under 2020 background plus site generated conditions.
- In order to improve sight lines at the northbound approach to the Belfast Road/ Triole Street intersection, it is recommended that the existing trees on the southwest corner of the intersection and along the south side of Belfast Road up to 30 m west of Triole Street be cleared.
- Truck turning simulations undertaken at the Belfast Road/ Triole Street intersection indicate that WB-20 trucks can complete turning movements to/from Triole Street within the pavement width provided but will have to encroach on adjacent lanes in order to complete the turns for the eastbound right-turn, westbound left-turn and

northbound right-turn movements. Based on the low projected volumes of WB-20 truck trips during the peak hours, these occurrences will be infrequent and are not expected to significantly impact traffic operations at the Belfast Road/ Triole Street intersection.

If you have any questions regarding the above, please do not hesitate to contact me at (613) 225-1311 Ext. 508.

Yours truly

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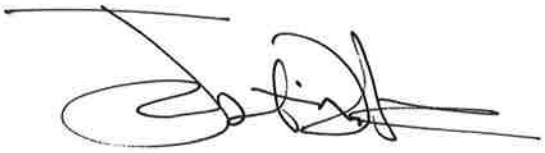


Justin Date, P.Eng.
Associate

:jcd

Attachments:

Appendix A – Site Plan

Appendix B – OC Transpo Maps

Appendix C – Intersection Capacity Analysis

Appendix D – Truck Turning Simulations

Appendix E – Sight Lines

Appendix A – Site Plan

1/SP1 LOCATION PLAN
SCALE N.T.S.

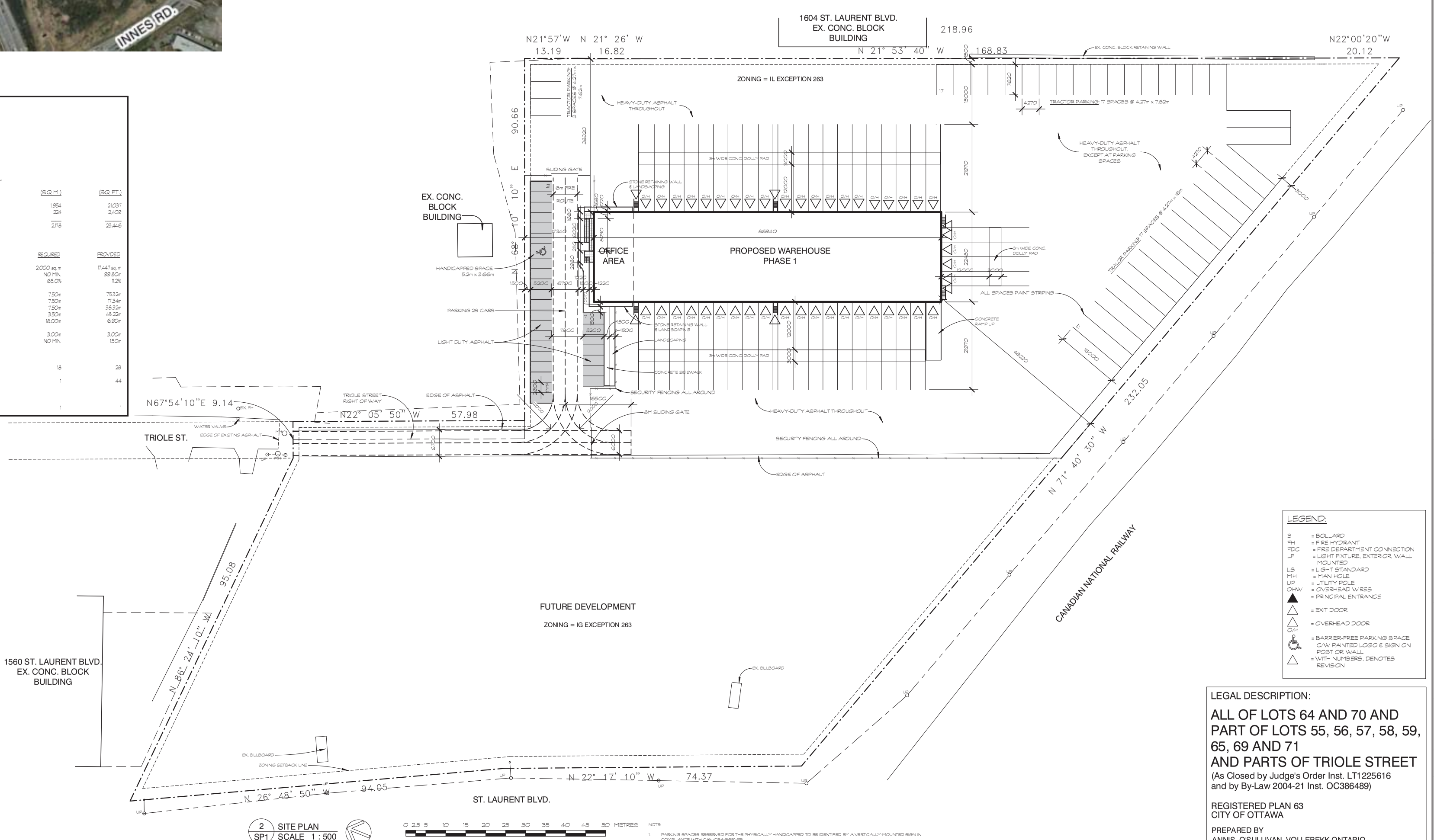
PROJECT ZONING REVIEW/STATISTICS

MUNICIPALITY: OTTAWA
MUNICIPAL ADDRESS: 1599 ST. LAURENT BLVD.
REGISTERED OWNER: REIMER PROPERTIES INC.
LOT AREA = 32,390 sq. m (348,643 sq.ft.) (8.00 ACRES)

ZONING ANALYSIS:
OTTAWA
ZONING BY-LAW: 2008-250
ZONE: IL EXCEPTION 263 & IG EXCEPTION 263
PROPOSED USE: TRUCK TRANSPORT TERMINAL

BUILDING AREAS	(SQ M.)	(SQ FT.)
GROUND FLOOR	1,954	21,037
MEZZANINE	224	2,409
GROSS TOTAL AREA	2,178	23,446

DEVELOPMENT STANDARDS	REQUIRED	PROVIDED
MINIMUM LOT AREA - IL ZONE ONLY	2,000 sq. m	17,447 sq. m
MINIMUM LOT WIDTH	NO MIN.	99.80m
MAXIMUM LOT COVERAGE	65.0%	11.2%
MINIMUM REQUIRED YARD		
FRONT YARD	7.50m	75.32m
INTERIOR SIDE YARD (NORTH)	7.50m	17.34m
INTERIOR SIDE YARD (EAST)	7.50m	38.32m
REAR YARD	3.50m	48.22m
MAXIMUM BUILDING HEIGHT	18.00m	6.90m
MINIMUM WIDTH OF LANDSCAPING		
ABUTTING A STREET	3.00m	3.00m
ALL OTHER CASES	NO MIN.	1.50m
PARKING SPACES GR.FLOOR WAREHOUSING @ .8/100 SQ M.	18	28
LOADING SPACES (3.5 x 7)	1	44
PARKING FOR PHYSICALLY DISABLED (BY-LAW 2003-530)	1	1



2/SP1 SITE PLAN
SCALE 1 : 500

0 2.5 5 10 15 20 25 30 35 40 45 50 METRES

NOTE:

1. PARKING SPACES RESERVED FOR THE PHYSICALLY HANDICAPPED TO BE IDENTIFIED BY A VERTICALLY-MOUNTED SIGN IN COMPLIANCE WITH CAN/CSA-B651-95.
2. EXTERIOR SITE LIGHTING SHALL BE DIRECTED ONTO THE SITE AWAY FROM ADJACENT PROPERTIES.
3. READ THIS DRAWING IN CONJUNCTION WITH THE LANDSCAPE DRAWINGS, THE CIVIL ENGINEERING DRAWINGS & THE ELECTRICAL DRAWINGS.

LEGAL DESCRIPTION:

ALL OF LOTS 64 AND 70 AND PART OF LOTS 55, 56, 57, 58, 59, 65, 69 AND 71 AND PARTS OF TRIOLE STREET
(As Closed by Judge's Order Inst. LT1225616 and by By-Law 2004-21 Inst. OC386489)

REGISTERED PLAN 63
CITY OF OTTAWA

PREPARED BY
ANNIS, O'SULLIVAN, VOLLEBEKK ONTARIO
LAND SURVEYORS
JANUARY 4, 2006

Registered Owner:
REIMER WORLD LOGISTICS CORP.
SUITE 2900, 201 PORTAGE AVENUE
WINNIPEG, MANITOBA, R3B 3K6
Tel: (204) 958-5300
Cell: (416) 678-7004
e-mail: eshwarz@reimerlogistics.com

Project Manager:
ARGUE CONSTRUCTION LTD.
105 WILLOWLEA RD.
CARP, ON. K0A 1L0
Tel: (613) 831-7044
Fax: (613) 831-6344
e-mail: keith@argueconstruction.ca

Civil Engineer:
CAPITAL ENGINEERING GROUP LTD.
110 DOSSETTER WAY
OTTAWA, ONTARIO, K1G 4S5
Tel: (613) 739-0776
Fax: (613) 739-7302
e-mail: cegl@rogers.com

Geotechnical Engineer:
INSPEC-SOL INC.
179 COLONNADE ROAD, SUITE 400
NEPEAN, ONTARIO K2E 7J4
Tel: (613) 727-0895
Fax: (613) 727-0581
e-mail:

Landscape Architect:
FOTENN CONSULTANTS INC.
223 McLEOD STREET
OTTAWA, ONTARIO K2P 0Z8
Tel: (613) 730-5709
Fax: (613) 730-1136
e-mail: casagrande@fotenn.com

Surveyor:
ANNIS O'SULLIVAN VOLLEBEKK LTD.
14 CONCOURSE GATE, SUITE 500
OTTAWA, ONTARIO K2E 7S6
Tel: (613) 727-0850
Fax: (613) 727-1079
e-mail:

No.	DATE	DESCRIPTION
REVISIONS:		
ISSUED FOR THE PURPOSE OF:		
PERMIT		
TENDER		
CONSTRUCTION		

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT.
ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS.
DO NOT SCALE DRAWINGS.
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Fax (613) 729-1558
E-mail: lkoffman@travel-net.com

OWNER
REIMER PROPERTIES INC.

PROJECT
APEX MOTOR EXPRESS
TRUCK TERMINAL
1599 ST. LAURENT BLVD.
OTTAWA, ON.

DRAWING TITLE
SITE PLAN

DRAWN	DATE	SCALE
AK/BR	DEC 02/14	AS NOTED

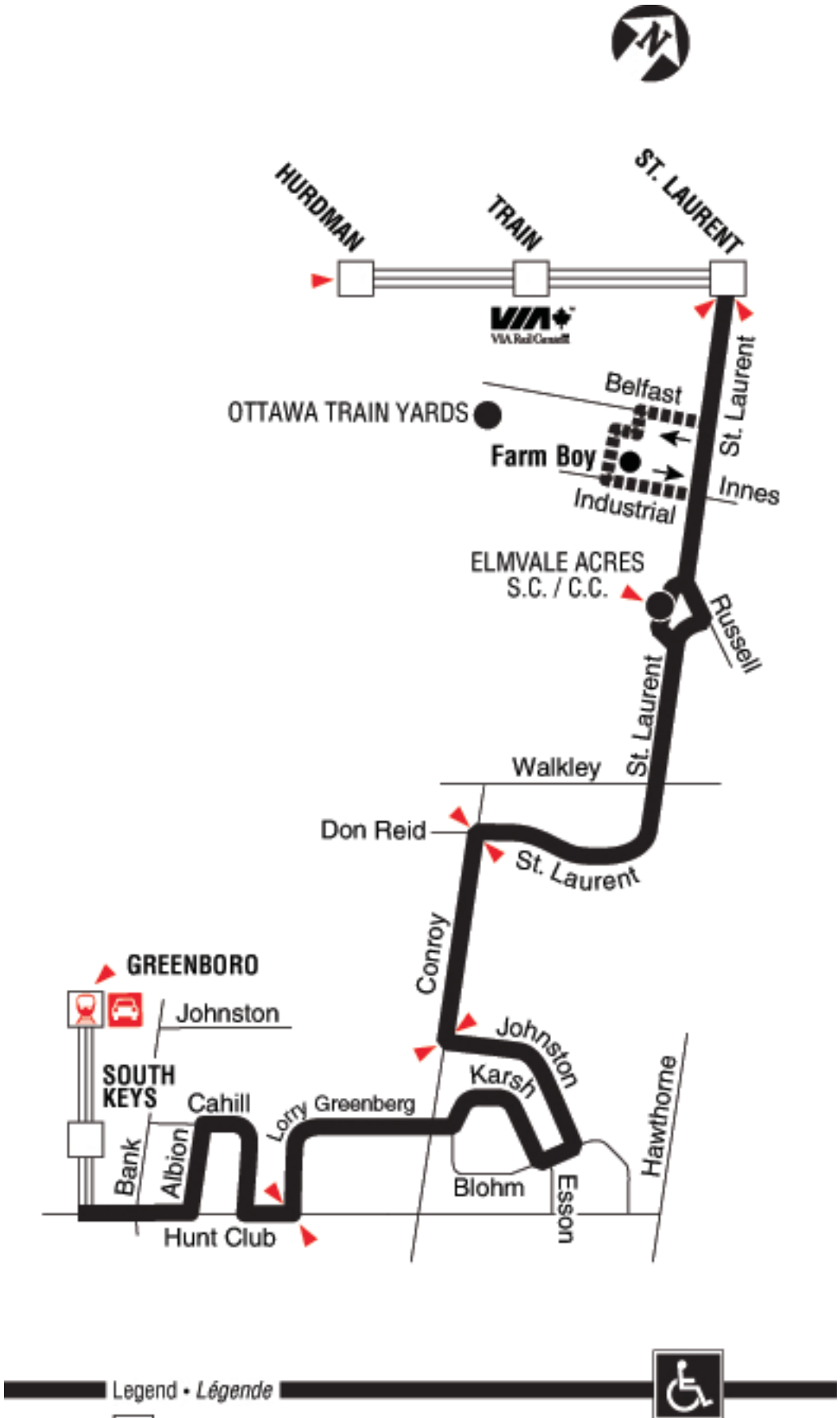
PROJECT NORTH

PROJECT N° 1408

REVISION N°

DRAWING N° SP1

Appendix B – OC Transpo Maps



Legend • *Légende*

Transitway & Station

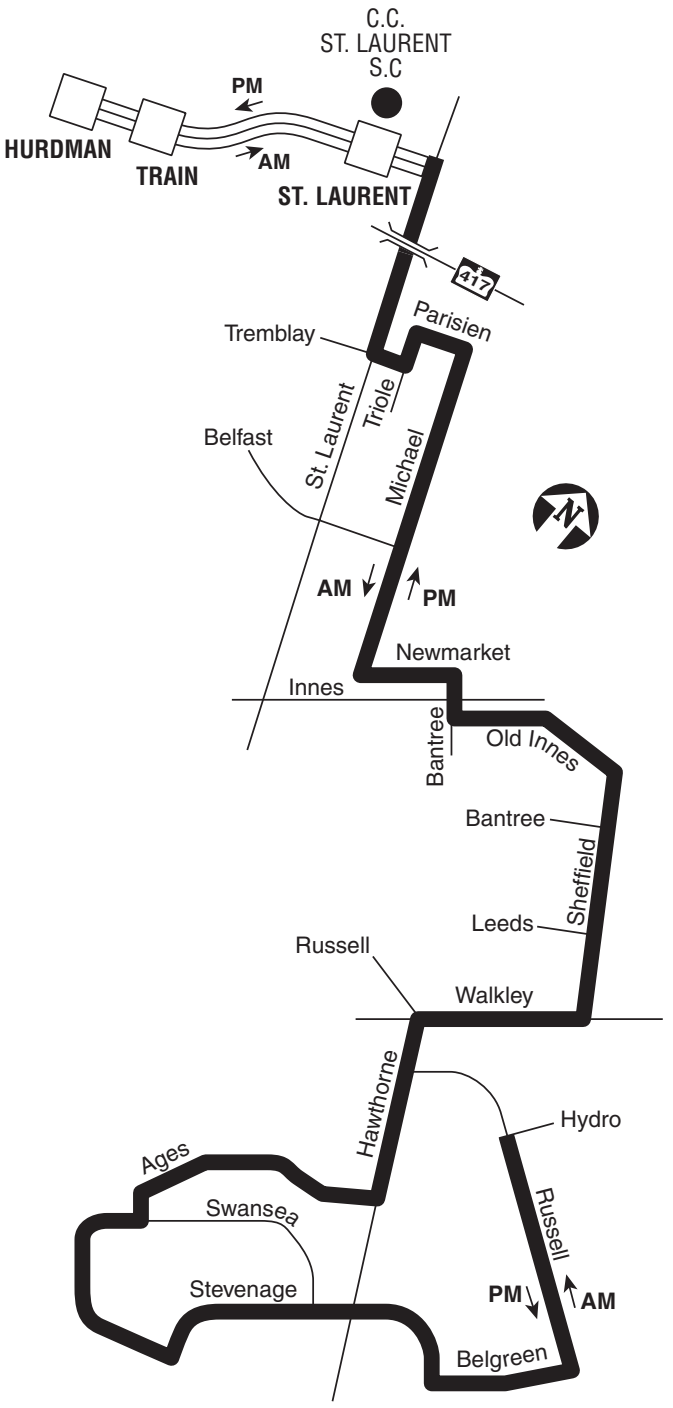
Some trips early morning only /
Quelques trajets tôt le matin seulement

Light Rail Connection / *Correspondance au train léger*

Park & Ride / *Parc-o-Bus*

Timepoint / *Heures de passage*

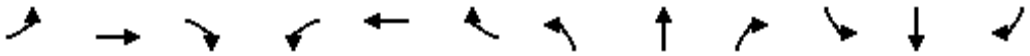
Route / Circuit 192



Legend • *Légende*

Transitway & Station

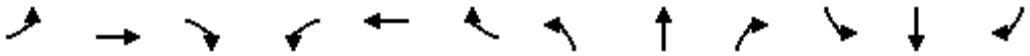
Appendix C – Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	17	241	15	13	409	19	3	2	3	10	0	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	262	16	14	445	21	3	2	3	11	0	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	465			278			800	801	270	795	798	455
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	465			278			800	801	270	795	798	455
tC, single (s)	4.3			4.2			8.1	7.0	7.2	7.5	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.3			4.4	4.5	4.2	3.9	4.0	3.3
p0 queue free %	98			99			98	99	99	96	100	98
cM capacity (veh/h)	1017			1213			204	261	582	256	312	605

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	297	479	9	21
Volume Left	18	14	3	11
Volume Right	16	21	3	10
cSH	1017	1213	290	352
Volume to Capacity	0.02	0.01	0.03	0.06
Queue Length 95th (m)	0.4	0.2	0.6	1.3
Control Delay (s)	0.7	0.4	17.8	15.9
Lane LOS	A	A	C	C
Approach Delay (s)	0.7	0.4	17.8	15.9
Approach LOS			C	C

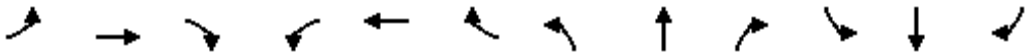
Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	37.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	55	290	32	22	388	21	24	1	10	26	1	46
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	60	315	35	24	422	23	26	1	11	28	1	50
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	445			350			984	945	333	945	951	433
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	445			350			984	945	333	945	951	433
tC, single (s)	4.3			4.3			7.4	7.5	6.6	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.4			3.8	4.9	3.7	3.5	4.0	3.3
p0 queue free %	94			98			85	99	98	87	100	92
cM capacity (veh/h)	1008			1125			172	168	630	224	241	627

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	410	468	38	79
Volume Left	60	24	26	28
Volume Right	35	23	11	50
cSH	1008	1125	217	377
Volume to Capacity	0.06	0.02	0.18	0.21
Queue Length 95th (m)	1.3	0.5	4.3	5.5
Control Delay (s)	1.8	0.6	25.1	17.1
Lane LOS	A	A	D	C
Approach Delay (s)	1.8	0.6	25.1	17.1
Approach LOS			D	C

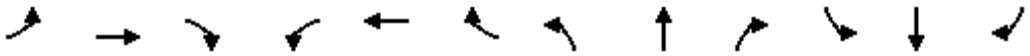
Intersection Summary				
Average Delay	3.4			
Intersection Capacity Utilization	50.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	263	16	14	446	21	3	2	3	11	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	286	17	15	485	23	3	2	3	12	0	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	508			303			871	872	295	865	869	496
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	508			303			871	872	295	865	869	496
tC, single (s)	4.3			4.2			8.1	7.0	7.2	7.5	6.5	6.4
tC, 2 stage (s)												
tF (s)	2.4			2.3			4.4	4.5	4.2	3.9	4.0	3.5
p0 queue free %	98			99			98	99	99	95	100	98
cM capacity (veh/h)	980			1187			179	235	562	227	283	535

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	323	523	9	23
Volume Left	20	15	3	12
Volume Right	17	23	3	11
cSH	980	1187	261	313
Volume to Capacity	0.02	0.01	0.03	0.07
Queue Length 95th (m)	0.4	0.3	0.7	1.6
Control Delay (s)	0.7	0.4	19.3	17.4
Lane LOS	A	A	C	C
Approach Delay (s)	0.7	0.4	19.3	17.4
Approach LOS			C	C

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	40.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	316	35	24	423	23	26	1	11	28	1	50
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	343	38	26	460	25	28	1	12	30	1	54
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	485			382			1072	1030	362	1030	1036	472
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	485			382			1072	1030	362	1030	1036	472
tC, single (s)	4.3			4.3			7.4	7.5	6.6	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.4			3.8	4.9	3.7	3.5	4.0	3.3
p0 queue free %	93			98			81	99	98	84	99	91
cM capacity (veh/h)	973			1095			146	146	605	194	212	596

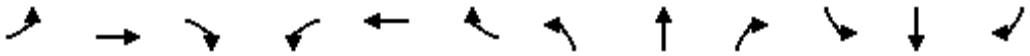
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	447	511	41	86
Volume Left	65	26	28	30
Volume Right	38	25	12	54
cSH	973	1095	187	339
Volume to Capacity	0.07	0.02	0.22	0.25
Queue Length 95th (m)	1.5	0.5	5.7	6.9
Control Delay (s)	2.0	0.7	29.6	19.2
Lane LOS	A	A	D	C
Approach Delay (s)	2.0	0.7	29.6	19.2
Approach LOS			D	C

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	263	23	17	446	21	6	2	4	11	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	286	25	18	485	23	7	2	4	12	0	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	508			311			882	882	298	876	883	496
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	508			311			882	882	298	876	883	496
tC, single (s)	4.3			4.2			7.9	7.0	7.2	7.5	6.5	6.4
tC, 2 stage (s)												
tF (s)	2.4			2.3			4.2	4.5	4.2	3.8	4.0	3.5
p0 queue free %	98			98			97	99	99	95	100	98
cM capacity (veh/h)	985			1195			187	231	559	226	277	539

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	330	526	13	23
Volume Left	20	18	7	12
Volume Right	25	23	4	11
cSH	985	1195	250	312
Volume to Capacity	0.02	0.02	0.05	0.07
Queue Length 95th (m)	0.4	0.3	1.1	1.6
Control Delay (s)	0.7	0.5	20.2	17.4
Lane LOS	A	A	C	C
Approach Delay (s)	0.7	0.5	20.2	17.4
Approach LOS			C	C

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	41.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	316	42	27	423	23	30	1	13	28	1	50
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	343	46	29	460	25	33	1	14	30	1	54
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	485			389			1083	1040	366	1042	1051	472
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	485			389			1083	1040	366	1042	1051	472
tC, single (s)	4.3			4.4			7.4	7.5	6.5	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.4			3.8	4.9	3.6	3.5	4.0	3.3
p0 queue free %	93			97			78	99	98	84	99	91
cM capacity (veh/h)	977			1050			145	143	619	189	208	596

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	454	514	48	86
Volume Left	65	29	33	30
Volume Right	46	25	14	54
cSH	977	1050	187	334
Volume to Capacity	0.07	0.03	0.26	0.26
Queue Length 95th (m)	1.5	0.6	6.8	7.1
Control Delay (s)	1.9	0.8	30.7	19.5
Lane LOS	A	A	D	C
Approach Delay (s)	1.9	0.8	30.7	19.5
Approach LOS			D	C

Intersection Summary				
Average Delay	4.0			
Intersection Capacity Utilization	53.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Appendix D – Truck Turning Simulations

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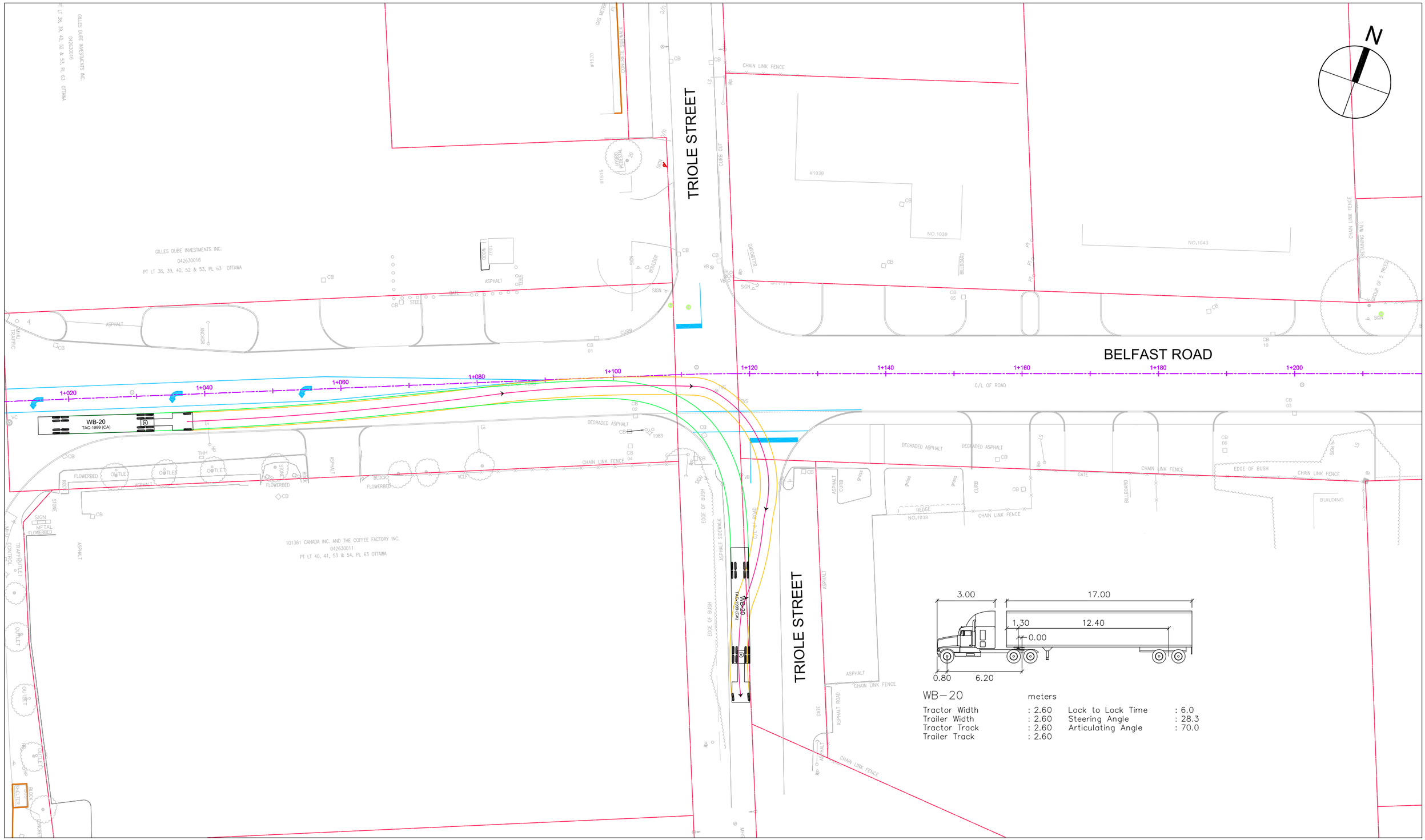
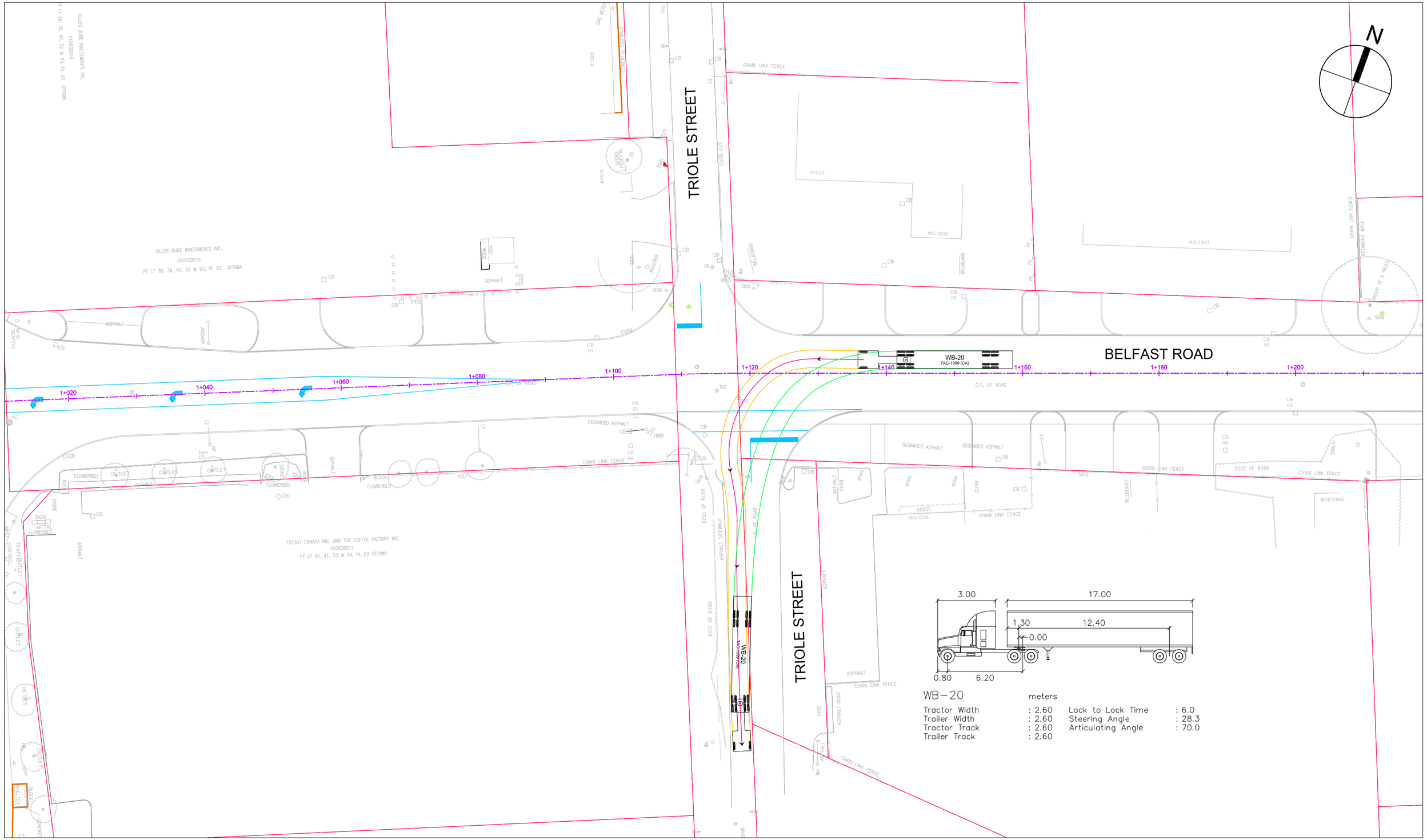


WB–20 meters

Tractor Width	: 2.60	Lock to Lock Time	: 6.0
Trailer Width	: 2.60	Steering Angle	: 28.3
Tractor Track	: 2.60	Articulating Angle	: 70.0
Trailer Track	: 2.60		

Scale	Project Title	Drawing Title	Sheet No.
1:500	1599 St. Laurent Boulevard Transportation Overview	WB-20 Truck Turning Simulation Eastbound Right-Turn	1



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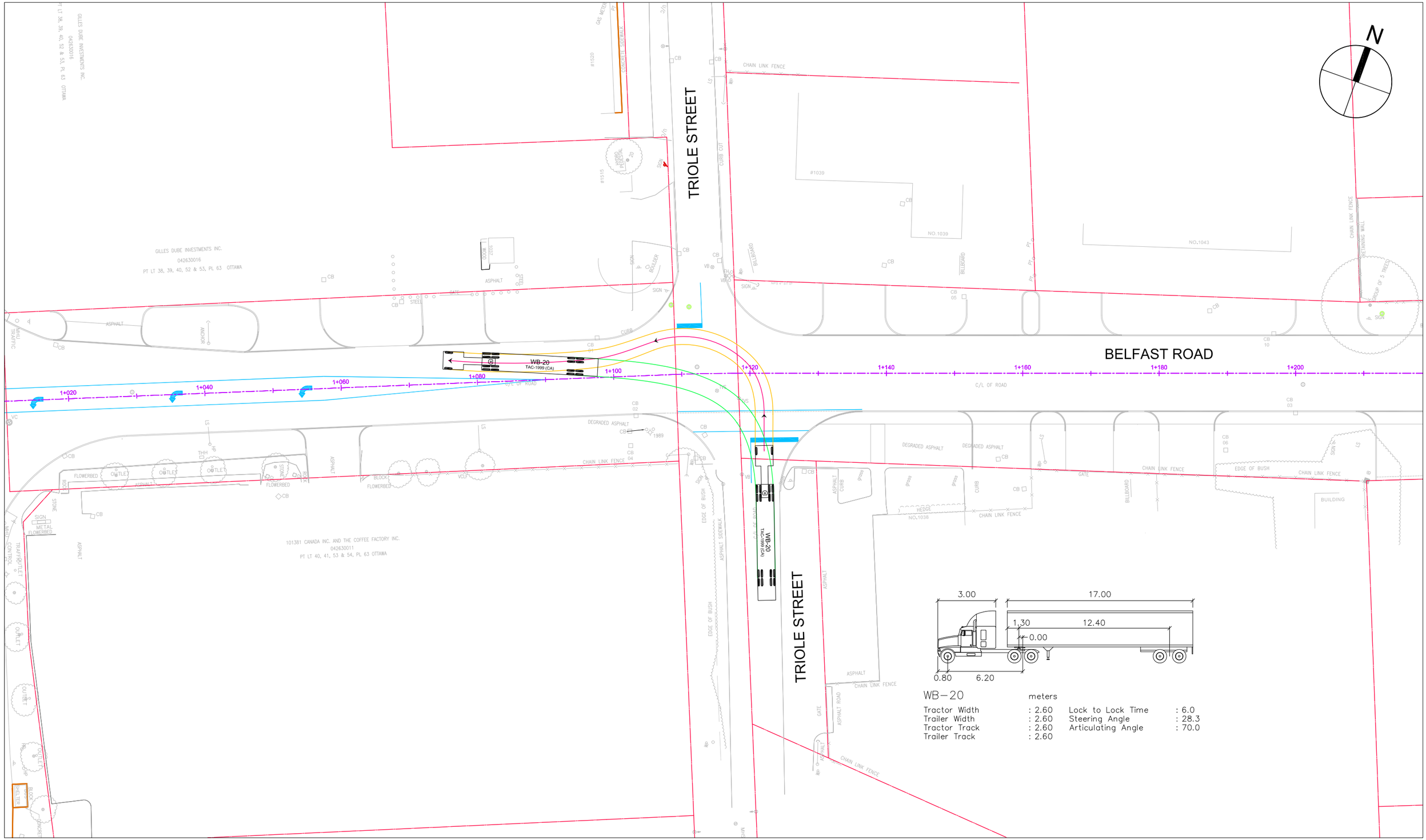
Scale	Project Title	Drawing Title	Sheet No.
1:500	1599 St. Laurent Boulevard Transportation Overview	WB-20 Truck Turning Simulation Westbound Left-Turn	2



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Scale	Project Title	Drawing Title	Sheet No.
1:500	1599 St. Laurent Boulevard Transportation Overview	WB-20 Truck Turning Simulation Northbound Left-Turn	3

J:\37167-1599StLaurentTransp\5.9 Drawings\59civil\current\37167-Geometry (ACAD2010).dwg Sheet Set: ####

TRIOLE STREET

BELFAST ROAD

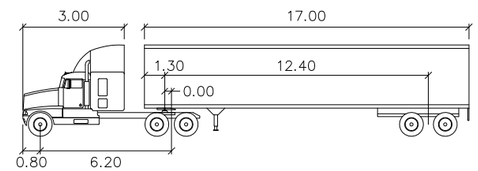
TRIOLE STREET

WB-20
TAC-1999 (CA)

1+020 1+040 1+060 1+080 1+100 1+120 1+140 1+160 1+180 1+200

GILLES DUBE INVESTMENTS INC.
042630016
PT LT 38, 39, 40, 52 & 53, PL 63 OTTAWA

101381 CANADA INC. AND THE COFFEE FACTORY INC.
042630011
PT LT 40, 41, 53 & 54, PL 63 OTTAWA

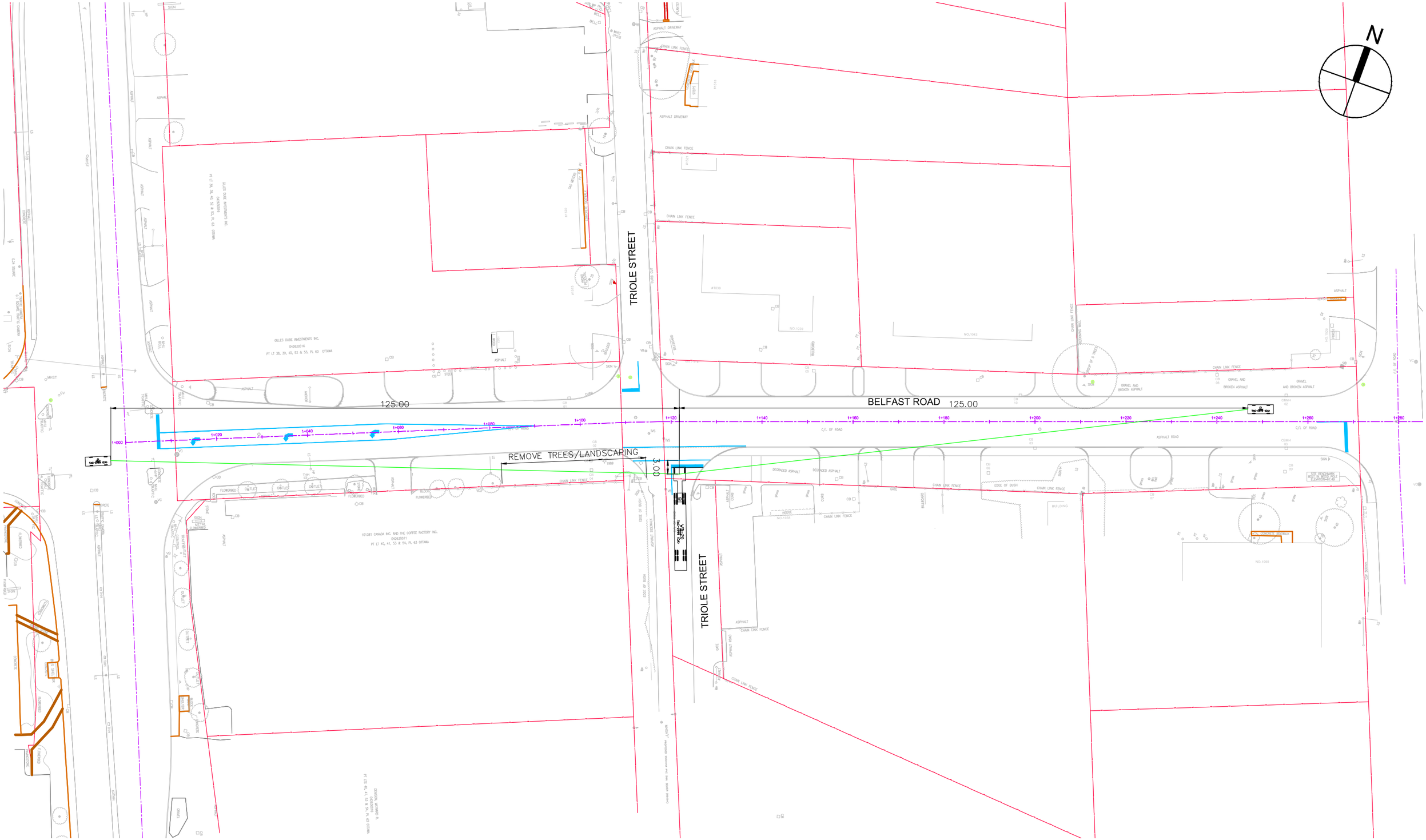


WB-20 meters

Tractor Width	: 2.60	Lock to Lock Time	: 6.0
Trailer Width	: 2.60	Steering Angle	: 28.3
Tractor Track	: 2.60	Articulating Angle	: 70.0
Trailer Track	: 2.60		

Scale	Project Title	Drawing Title	Sheet No.
1:500	1599 St. Laurent Boulevard Transportation Overview	WB-20 Truck Turning Simulation Northbound Right-Turn	4

Appendix E – Sight Lines



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Scale	Project Title	Drawing Title	Sheet No.
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