2596 Carp Road

Transportation Impact Assessment

Step 2 Scoping Report

Prepared for:

1384341 Ontario Ltd.
9094 Cavanagh Road
Ashton, ON K0A 1B0

Prepared by:

CGH TRANSPORTATION
13 Markham Avenue
Nepean, ON K2G 3Z1

March 2019

PN: 2019-04

Table of Contents

List of Figures

Table of Tables

List of Appendices

1 Screening

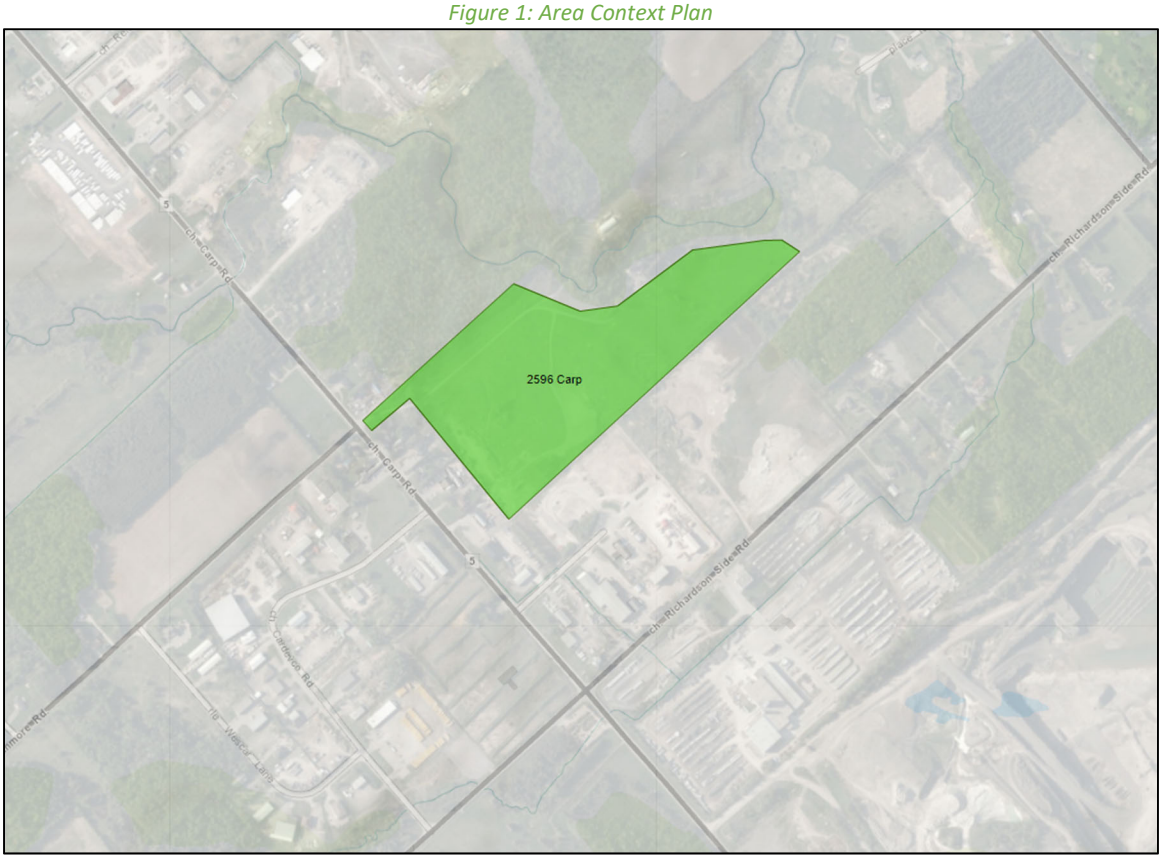
This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for TIA Study PM. As shown in the Screening Form, a TIA is required including the Design Review component and the Network Impact Component.

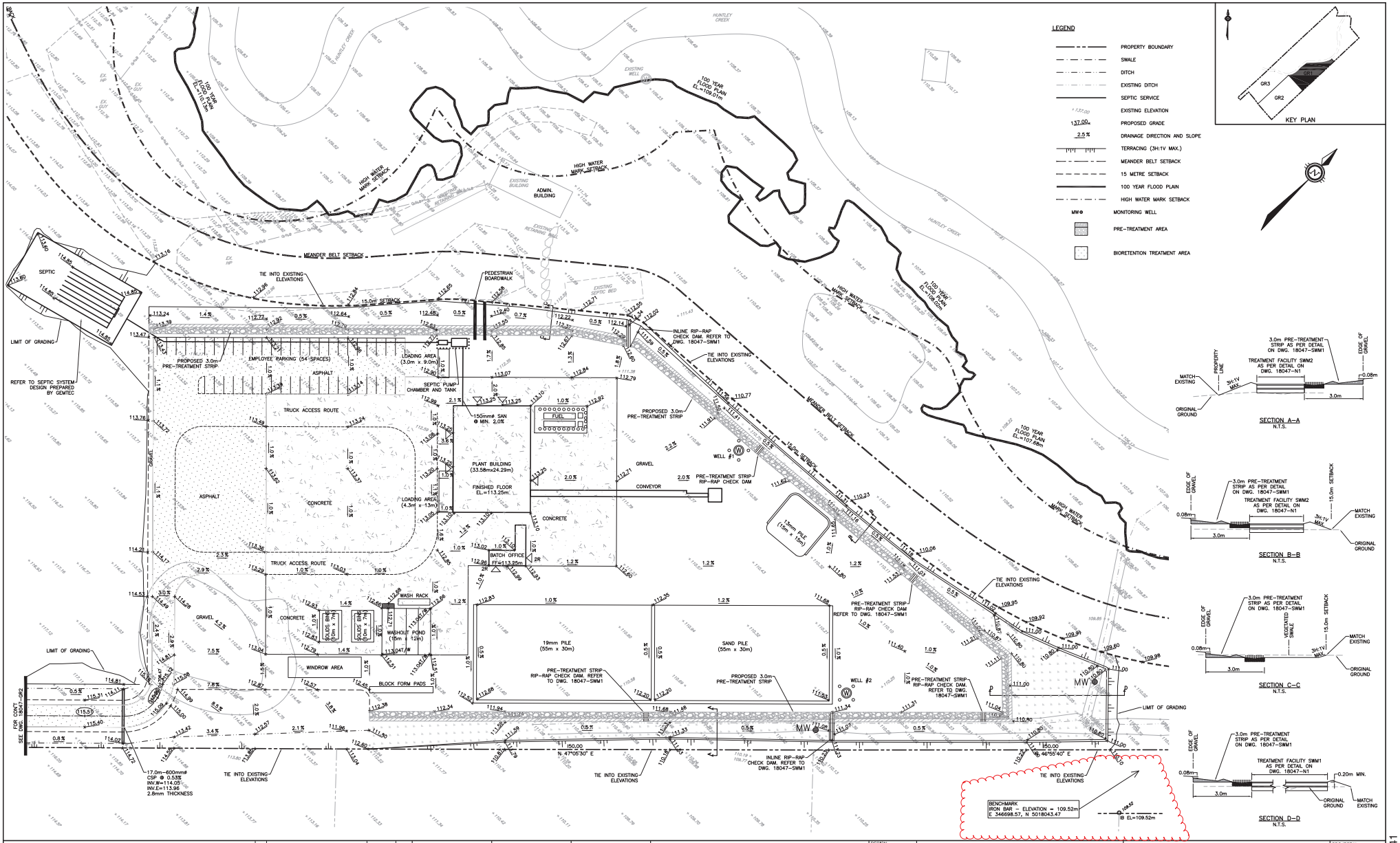
2 Existing and Planned Conditions

2.1 Proposed Development

The proposed development, located at 2596 Carp Road, is within the Carp Road Corridor Rural Employment zone. The site is zoned as RG5, RG5, and RG5[275r]-h Rural General that permits retail limited to the sale of agricultural, construction, gardening or landscape-related products, equipment or supplies. The proposed development is for a concrete batching plant and related services. The site will access Carp Road at the existing driveway location, opposite Cavanmore Road, as a full movement access. The anticipated full build-out and occupancy horizon is 2022. Figure 1 illustrates the Study Area Context. Figure 2 illustrates the proposed concept plan.

Figure 1: Area Context Plan





NOTES

THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM. ALL ELEVATIONS SHOWN ARE GEODETIC.

NO.	REVISION DESCRIPTION	DATE	BY
2	REVISED PER COMMENTS	20/12/18	AHJ
1	ISSUED FOR SITE PLAN APPLICATION	19/09/18	AHJ

SCALE
0 5m 10m 20m
HORIZONTAL 1:500

Robinson Land Development
350 Palladium Drive
Ottawa, ON K2V 1A8
(613) 592-6060 rcll.com

DESIGN	BLM
CHECKED	AHJ
DRAWN	BLM
CHECKED	AHJ
APPROVED	AHJ

1384341 ONTARIO LTD.

2596 CARP ROAD
OTTAWA, ON

GRADING PLAN

PROJECT No.	18047
SURVEY	CAVANAGH
DATED	SEPTEMBER 2018
DWG. No.	18047-GR1

D-07-12-18-0141

2.2 Existing Conditions

2.2.1 Area Road Network

Carp Road: Carp Road is a City of Ottawa arterial road with a two-lane rural cross-section including a paved shoulder. The posted speed limit is 80 km/h. The Ottawa Official Plan reserves a 37.5 metre right of way south of Richardson Side Road and the Carp Road Corridor Community Design Plan identifies 30.0 metres north to the north.

Richardson Side Road: Richardson Side Road is a City of Ottawa arterial road with a two-lane rural cross-section including a paved shoulder. The posted speed limit is 80 km/h and the right-of-way is 26.0 metres.

Cavanmore Road: Cavanmore Road is a City of Ottawa collector road with a two-lane unpaved rural cross-section. The unposted speed limit is 80 km/h. The right-of-way is 13.5 metre at Carp Road and expands to 26.0 metres to the west.

Cardevco Road: Cardevco Road is a City of Ottawa local road with a two-lane rural cross-section with gravel shoulders. The posted speed limit is 40 km/h and the right-of-way is currently 27.0 metres.

2.2.2 Existing Intersections

Carp Road / Richardson Side Road	The intersection of Carp Road at Richardson Side Road is a signalized intersection with auxiliary left turn lanes on the north and south bound approaches. No turn restrictions were noted.

2.2.3 Existing Driveways

There are existing driveways on both side of Carp Road within 200 metres of the proposed site access. None of the driveways would provide access to significant traffic generators and would be captured within the existing turning movement counts at the adjacent intersection.

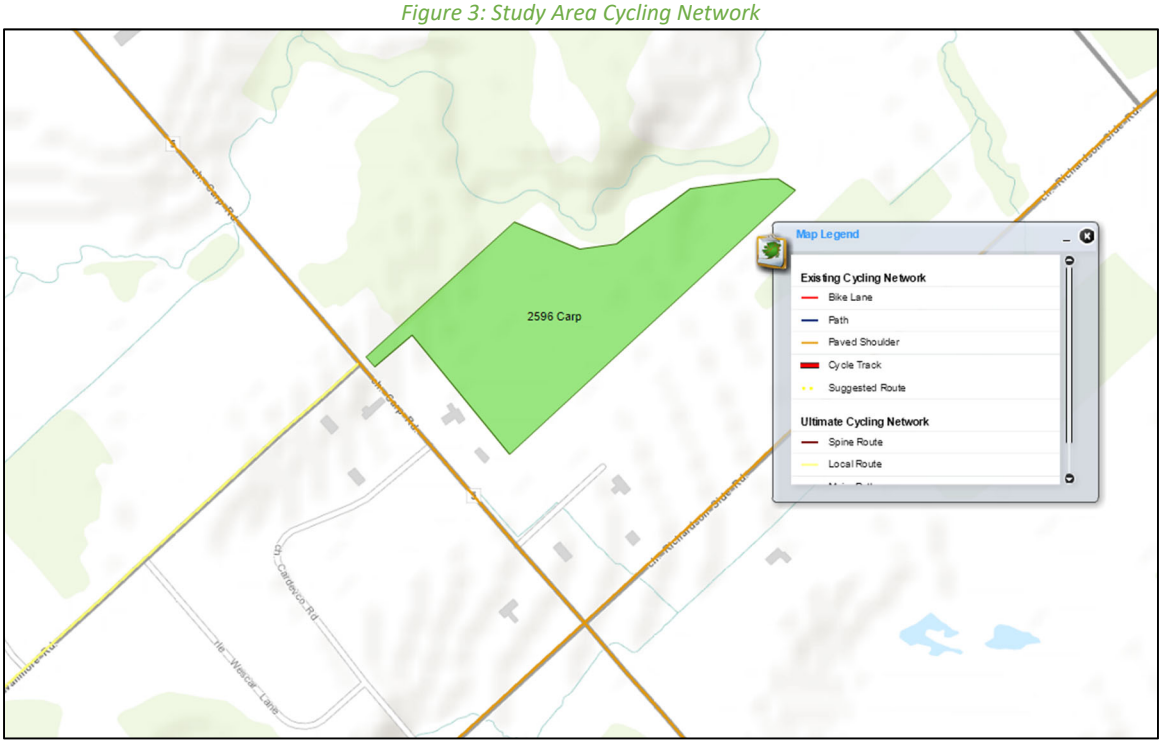
2.2.4 Cycling and Pedestrian Facilities

No pedestrian facilities are provided within the vicinity of the site. Paved shoulders are provided along Carp Road and Richardson Side Road.

Carp Road and Richardson Side Road are designated as City spine routes and Cavanmore Road is designated as a local route.

Figure 3 illustrates the cycling networks in the study area.

Figure 3: Study Area Cycling Network



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: February 22, 2019

2.2.5 Existing Transit

Route 303 runs along Carp Road on Wednesdays only, between Dunrobin and Carlingwood Mall. The route has a single trip during the AM peak and the PM peak. No other existing routes currently exist.

2.2.6 Existing Area Traffic Management Measures

There are no existing area traffic management measures within the Study Area.

2.2.7 Existing Peak Hour Travel Demand

Existing turning movement counts were acquired from the City of Ottawa for the existing Study Area intersection. Table 1 summarizes the intersection count dates.

Table 1: Intersection Count Date

Intersection	Count Date
Carp Rd @ Richardson Side Rd	Thursday, May 04, 2017

Detailed turning movement count data is included in Appendix B. Figure 4 illustrates the existing traffic counts and Table 2 summarizes the existing intersection operations. The level of service is based on the HCM criteria for average delay at signalized intersections. Detailed turning movement count data is included in Appendix B and the synchro worksheets are provided in Appendix C.

Figure 4: Existing Traffic Counts

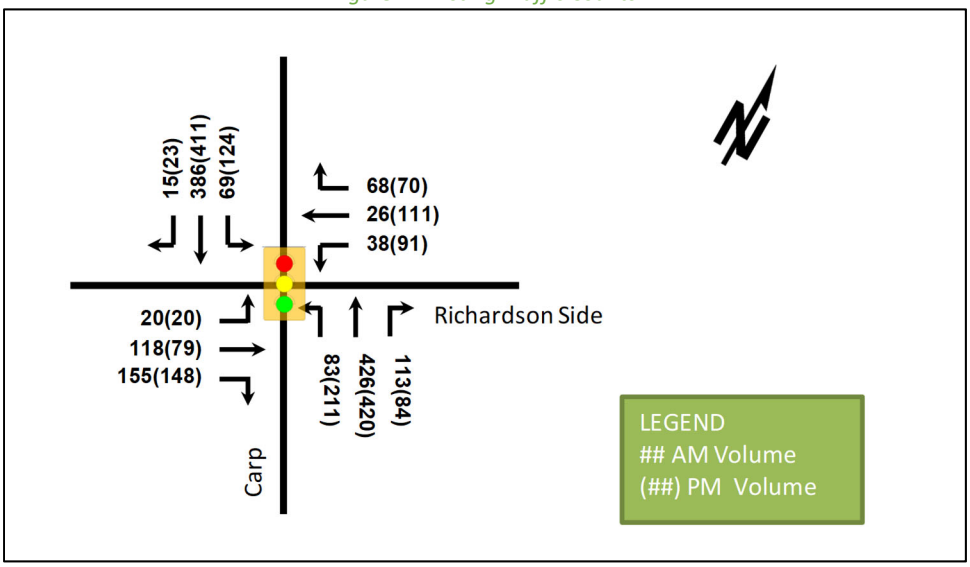


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	Delay	V/C	Q (95th)	LOS	Delay	V/C	Q (95th)
Carp Road & Richardson Side Road ***Signalized***	EB	D	40.2	0.79	73.3	C	23.8	0.55	53.8
	WB	C	23.1	0.49	30.7	E	64.4	0.92	86.8
	NBL	A	9.0	0.17	16.4	B	18.6	0.52	62.1
	NBT/R	B	11.9	0.54	102.9	B	15.0	0.54	116.8
	SBL	A	9.6	0.18	15.0	B	15.2	0.35	34.1
	SBT/R	A	9.9	0.39	68.1	B	13.8	0.46	95.0
	Overall	**B**	**17.6**	-	-	**C**	**23.9**	-	-

Overall, the intersection of Carp Road and Richardson Side Road operates well during the AM and PM peak hours. The eastbound approach experiences the highest delay during the AM peak with over40 seconds of delay, and the westbound approach experiences the highest delay during the PM peak with over 64 seconds of delay. During both peak hours, the northbound through/right-turn lane have the longest 95th percentile queues with each potentially over 100m long. The GB Pre-Fab Garden Sheds access on the eastbound approach may become blocked during both peak hours.

2.2.8 Collision Analysis

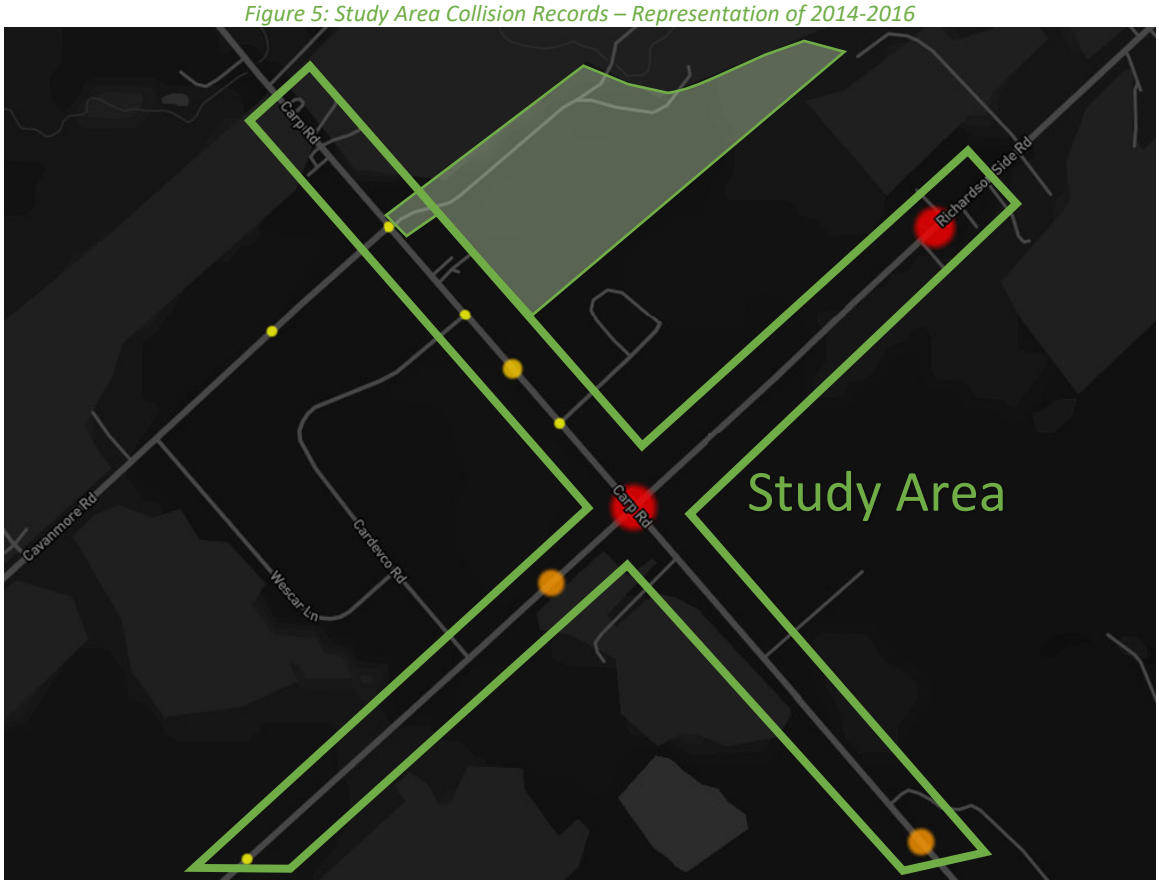
Collision data has been acquired from the City of Ottawa for five years (2013-2017) prior to the commencement of this TIA at each of the Study Area intersections. Table 3 summarizes the collisions for the study area and Figure 5 illustrates a representation of the collision locations in the study area.

Table 3: Collision Summary – 2013-2017

		Number	%
Total Collisions		**54**	**100%**
Classification	Fatality	0	0%
	Non-Fatal Injury	7	13%
	Property Damage Only	47	87%
Initial Impact Type	Approaching	3	6%
	Angle	7	13%
	Rear end	13	24%
	Turning Movement	6	11%

	SMV Other	21	39%
	SMV Unattended	1	2%
	Other	3	6%
Road Surface Condition	Dry	34	63%
	Wet	12	22%
	Loose Snow	5	9%
	Packed Snow	1	2%
	Ice	2	4%
Pedestrian Involved		**0**	**0%**
Cyclists Involved		**0**	**0%**

Figure 5: Study Area Collision Records – Representation of 2014-2016



The collisions within the study area are generally property damage collisions (83%) with the primary impact types of rear end (24%) and single motor vehicle other (39%), with the road conditions area typically dry (63%) or wet (22%). Of the 54 total collisions, 13 (or 24%) occurred at the intersection of Carp Road and Richardson Side Road, 12 (or 22%) along Richardson Side Road between Carp Road and Highway 417 interchange, and 11 (or 20%) Richardson Side Road between Carp Road and Oak Creek Road. Overall no trends were identified that would be exacerbated by the operation of the concrete batching plant.

Collision data is included in Appendix C.

2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

The subject development is within the Carp Road Corridor Rural Employment area. No transportation network changes are identified, and individual transportation impact assessments should recommend any local improvements to support specific developments.

No improvements are identified within the Transportation Master Plan Ultimate Network.

2.3.2 Other Study Area Developments

The following developments are listed on the City's Development Application Search tool:

- 2491 Carp Rd – proposed to rezone to allow the sale of sheds within the existing business
- 2688 Carp – proposed construction of a repair garage and office, with a total 599 square metres, to support the existing heavy equipment yard/business
- 512 William Mooney Road & 2349 to 2437 Carp Road – proposed landfill with less than 5 trips anticipated to travel north along Carp Road to the Richardson Side Road intersection
- 127 Cardevco Rd – proposed new 2-storey 670 square metre warehouse within the existing business park
- 210-220 Maple Creek Ct – proposed new 7,432 square metre warehouse that will consist of multiple phases for four tenants

With the exception of the proposed landfill, no traffic studies were prepared for these applications and it is assumed that they will have minimal impact on the traffic volumes at the Carp Road and Richardson Side Road intersection and be accounted for within the background growth projections.

3 Study Area and Time Periods

3.1 Study Area

The study area will include the intersection of Carp Road and Richardson Side Road intersection and will include examining Carp Road as a Boundary Road.

3.2 Time Periods

As the proposed development is composed entirely of concrete batching plant the AM and PM peak hours will be examined.

3.3 Horizon Years

The anticipated build-out year is 2022. As a result, the full build-out plus five years horizon year is 2027.

4 Exemption Review

Table 4 summarizes the exemptions for this TIA.

Table 4: Exemption Review

Module	Element	Explanation	Exempt/Required
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	Only required for site plans	Required
	4.2.3 New Street Networks	Only required for plans of subdivision	Exempt
4.2 Parking	4.2.1 Parking Supply	Only required for site plans	Required

Module	Element	Explanation	Exempt/Required
	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Exempt
Network Impact Component			
4.5 Transportation Demand Management	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Exempt
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Exempt
4.8 Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of equivalent volume permitted by established zoning	Exempt

In addition to the above TIA requirements and exemptions, the following exemptions in Table 5 are also recommended for this TIA.

Table 5: Recommended Additional Exemptions

Module	Element	Explanation
Forecasting		
3.1 Development Generated Travel Demand	All Elements	Trip generation trigger was not met, therefore trip and mode share forecasting is not required for the subject site. An estimation of the on-site activity (developed for the noise assessment) is approximately 29 vehicles per hour. With office staff and operators assumed to start at 7am on site, the estimated inbound volume would be approximately 35 vehicles and outbound 10 vehicles. Additionally, the anticipated operation of 7am-7pm day shift is outside the peak hours of the adjacent roadways. The anticipated trip distribution will be predominantly to the south (95%) to Highway 417 and limited to the north (5%) as Carp Road is a designated trucking route. For non-truck vehicles and local trips, the distribution will see the south (75%) remain the primary route, east (15%) having a much lower usage, and nominal trips coming from the west and north (5% each). Reference data is provided in Appendix E.
3.2 Background Network Travel Demand	All Elements	No intersection constraints were noted for the existing volumes and the background growth would continue to be accommodated within the network.
3.3 Demand Rationalization	All Elements	Subject to the trip generation trigger not being met, no demand rationalization is required as part of this TIA. The existing conditions summarized in Section 2.2.7 illustrates residual capacity in the existing road network and the network can support the anticipated trip generation of the proposed development.

Module	Element	Explanation
Design Review Component		
4.1 Development Design	4.1.1 Design for Sustainable Modes	The rural nature of the site does not provide any pedestrian, cycling, and transit service/facilities. Furthermore, the internal site is a function of the concrete batching plant operation and has been prepared to support that operation. Therefore, the need to for a TIA to outline the internal auto parking and pedestrian access to the site office is not required.
4.3 Boundary Street Design	All Elements	No boundary street frontage is limited to the access to the site and limited opportunity exists to increase the MMLOS of Carp Road due to the lack of existing/connecting facilities, speed of the roadway, and vehicular volumes along the roadway.
4.4 Access Intersection Design	All Elements	The access intersection is anticipated to be a typical private approach design, completed as per City standards and operational requirements for site vehicles. Therefore, the need for a TIA to review the access is not required and can be completed as part of the site plan review process within the existing submission.
Network Impact Components		
4.7 Transit	All Elements	No transit service is provided in the area.
4.9 Network Intersections	All Elements	As outlined previously in this table, the low traffic generation will have minimal impact on network intersections and sufficient capacity if currently provided to accommodate an increase in line with background growth.

5 Summary and Conclusion

The proposed development was initially submitted without the need for a TIA through the Screening Form during pre-consultation. Subsequent to the submission, the City requested that a TIA be completed for the proposed concrete batching plant at 2596 Carp Road.

In reviewing the Screening Form, the proposed site did not meet Trip Generation Trigger, met the Location Trigger solely on the Ultimate Cycling Plan classification of Carp Road as a spine route, and the Safety Trigger was met solely on the posted speed limit of Carp Road at 80 km/h. In addition to the low volumes anticipated during the daily operations, the peak site trips occurring outside the adjacent roadway peaks, and residual capacity on the network intersections further reduces the need to assess the background operations. For example, a 2% background growth would see the intersection volumes increase between 180-220 vehicles by the 2025 during the peak hours, easily accounting for the site generated trips. This increase in volume can be accommodated by the existing signal timing.

The Carp Road Corridor Rural Employment zone does not recommend any cycling facility upgrades, and paved shoulders achieve the spine corridor for a rural area. The proposed site will have limited impact on Carp Road as the only frontage is the site access. The private approach access is assumed to be full movement, consistent with the surrounding area, and is assumed to accommodate the anticipated site vehicles as per the City standards.

The collisions for the area were reviewed as part of the Screening Report, meeting the need to assess any safety risks with the proposed development. The collision review noted a single collision at the access location of Carp

Road and Cavanmore Road in 2015. The adjacent road segments experienced a one single motor vehicle collision immediately to the south and four immediately to the north involving single motor vehicles. All but one occurred in 2013.

The remaining modules and elements of the TIA Guidelines, outlined in Table 4, are internal to the site and can be reviewed as part of the existing site plan submission without the need for a TIA. At a high level, the parking spaces provided on site for employee parking is currently 50 spaces, allowing for shift change to occur and is not representative of the employees anticipated on site during normal operations. The access will be shifted south by approximately 7 metre, may be either asphalt or gravel surface, and will maintain the 8 metre radius to tie into the existing shoulder.

Given the above, it is the recommendation of this Screening Report that the TIA requirements for the proposed development have been met and no further review or assessment of the development is required.

Prepared By:

Andrew Harte, P.Eng.

Senior Transportation Engineer

Reviewed By:

Christopher Gordon, P.Eng.

Senior Transportation Engineer

Appendix A

TIA Screening Form and PM Certification Form

City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	2596 Carp Road Ottawa
Description of Location	Con. 2 Pt. Lot 6 RP4R11656 PT Part 1 Huntley
Land Use Classification	heavy industrial
Development Size (units)	n/a
Development Size (m^2)	Plant 900 m^2 Admin. Bldg. 224 m^2
Number of Accesses and Locations	1 access onto Carp Road
Phase of Development	n/a
Buildout Year	2019

If available, please attach a sketch of the development or site plan to this form.

2. Trip Generation Trigger

Considering the Development's Land Use type and Size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

Land Use Type	Minimum Development Size
Single-family homes	40 units
Townhomes or apartments	90 units
Office	3,500 m^2
Industrial	5,000 m^2
Fast-food restaurant or coffee shop	100 m^2
Destination retail	1,000 m^2
Gas station or convenience market	75 m^2

** If the development has a land use type other than what is presented in the table above, estimates of person-trip generation may be made based on average trip generation characteristics represented in the current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.*

If the proposed development size is greater than the sizes identified above, the Trip Generation Trigger is satisfied.

3. Location Triggers

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?	✓	
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?*		✓

**DPA and TOD are identified in the City of Ottawa Official Plan (DPA in Section 2.5.1 and Schedules A and B; TOD in Annex 6). See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA).*

If any of the above questions were answered with 'Yes,' the Location Trigger is satisfied.

4. Safety Triggers

	Yes	No
Are posted speed limits on a boundary street are 80 km/hr or greater?	✓	
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		✓
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)?		✓
Is the proposed driveway within auxiliary lanes of an intersection?		✓
Does the proposed driveway make use of an existing median break that serves an existing site?		✓
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		✓
Does the development include a drive-thru facility?		✓

If any of the above questions were answered with 'Yes,' the Safety Trigger is satisfied.

5. Summary

	Yes	No
Does the development satisfy the Trip Generation Trigger?		✓
Does the development satisfy the Location Trigger?	✓	
Does the development satisfy the Safety Trigger?	✓	

If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).

TIA Plan Reports

On 14 June 2017, the Council of the City of Ottawa adopted new Transportation Impact Assessment (TIA) Guidelines. In adopting the guidelines, Council established a requirement for those preparing and delivering transportation impact assessments and reports to sign a letter of certification.

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 s/he meets the four criteria listed below.

CERTIFICATION

1. 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;
2. 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;
3. 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
4. I am either a licensed[1] or registered[2] professional in good standing, whose field of expertise [check √ appropriate field(s)] is either transportation engineering √ or transportation planning □.

[1,2] 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.

City Of Ottawa
Infrastructure Services and Community Sustainability
Planning and Growth Management
110 Laurier Avenue West, 4th fl.
Ottawa, ON K1P 1J1
Tel. : 613-580-2424
Fax: 613-560-6006

Ville d'Ottawa
Services d 'infrastructure et Viabilité des collectivités
Urbanisme et Gestion de la croissance
110, avenue Laurier Ouest
Ottawa (Ontario) K1P 1J1
Tél. : 613-580-2424
Télécopieur: 613-560-6006

Dated at ___Ottawa_____ this __20__ day of _____September_____, 2018.
(City)

Name: _____Andrew Harte_____
(Please Print)

Professional Title: _____Professional Engineer_____

_____
Signature of Individual certifier that s/he meets the above four criteria

Office Contact Information (Please Print)
Address: 13 Markham Avenue
City / Postal Code: Ottawa / K2G 3Z1
Telephone / Extension: (613) 697-3797
E-Mail Address: Andrew.Harte@CGHTransportation.com

Appendix B

Turning Movement Counts

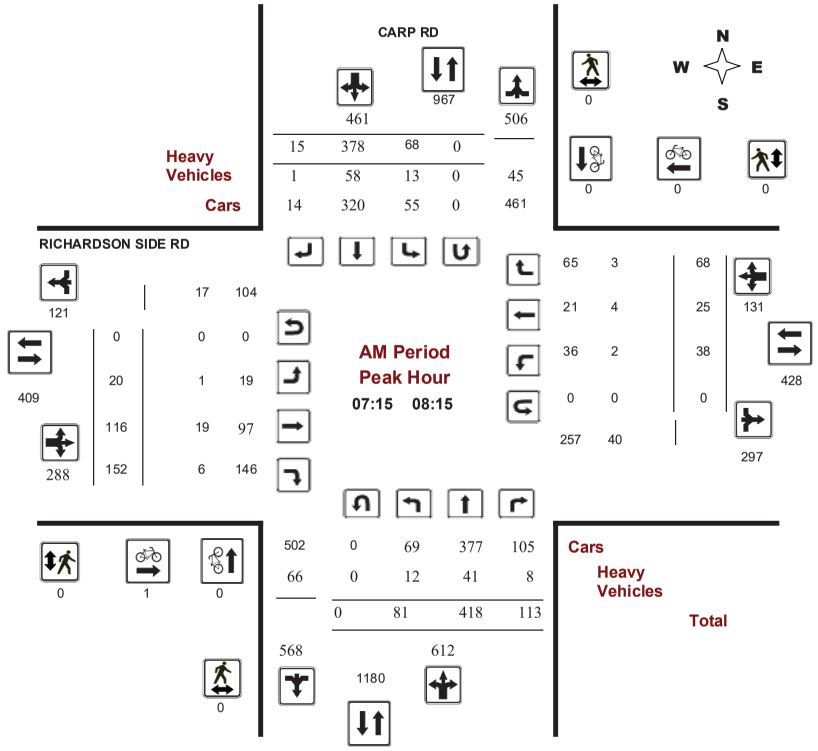
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARP RD @ RICHARDSON SIDE RD

Survey Date: Thursday, May 04, 2017 **WO No:** 36994

Start Time: 07:00 **Device:** Miovision



Comments

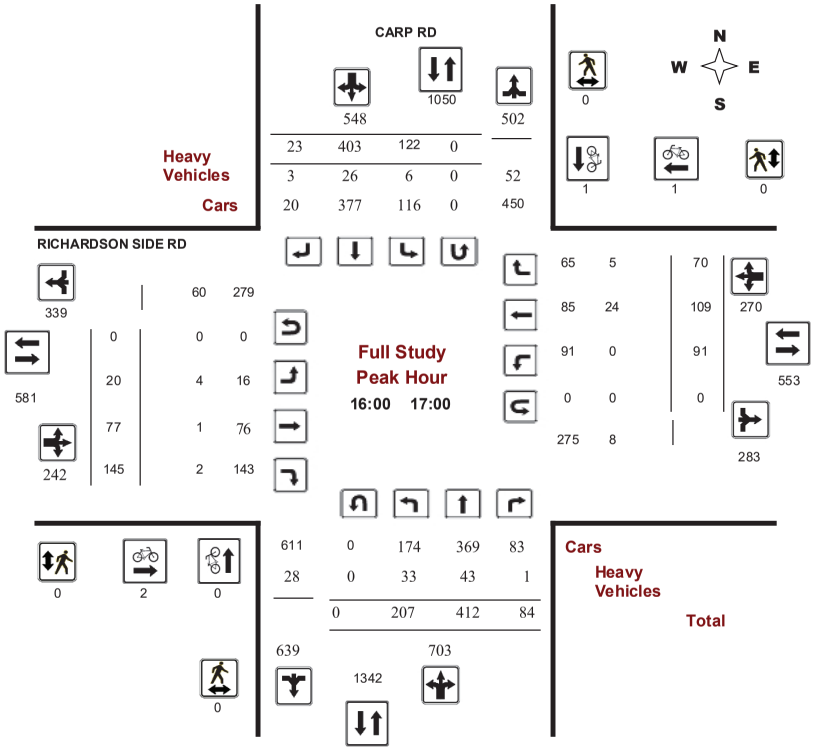
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARP RD @ RICHARDSON SIDE RD

Survey Date: Thursday, May 04, 2017 **WO No:** 36994

Start Time: 07:00 **Device:** Miovision



Comments

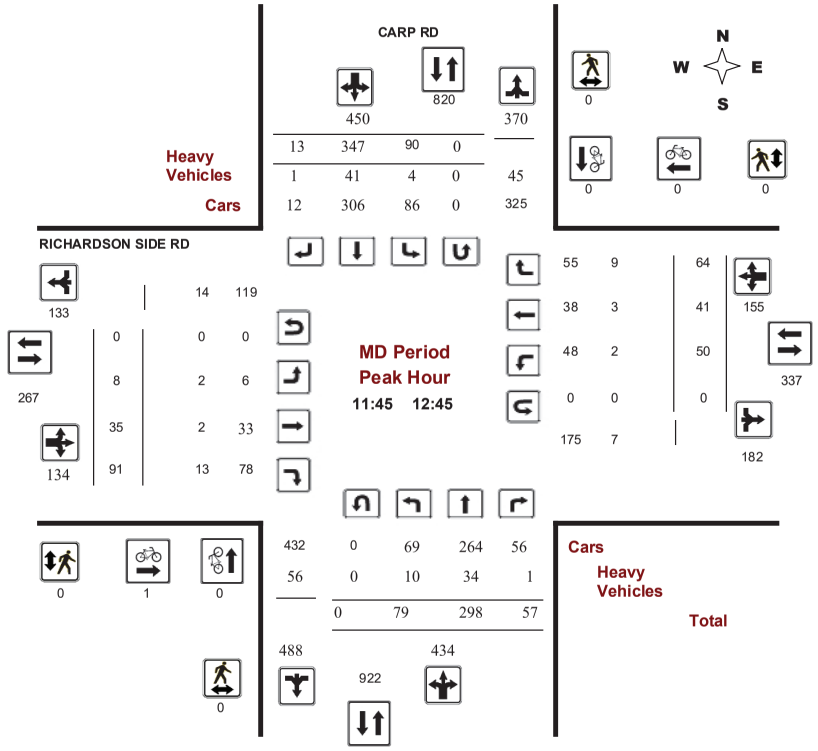
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARP RD @ RICHARDSON SIDE RD

Survey Date: Thursday, May 04, 2017 **WO No:** 36994

Start Time: 07:00 **Device:** Miovision



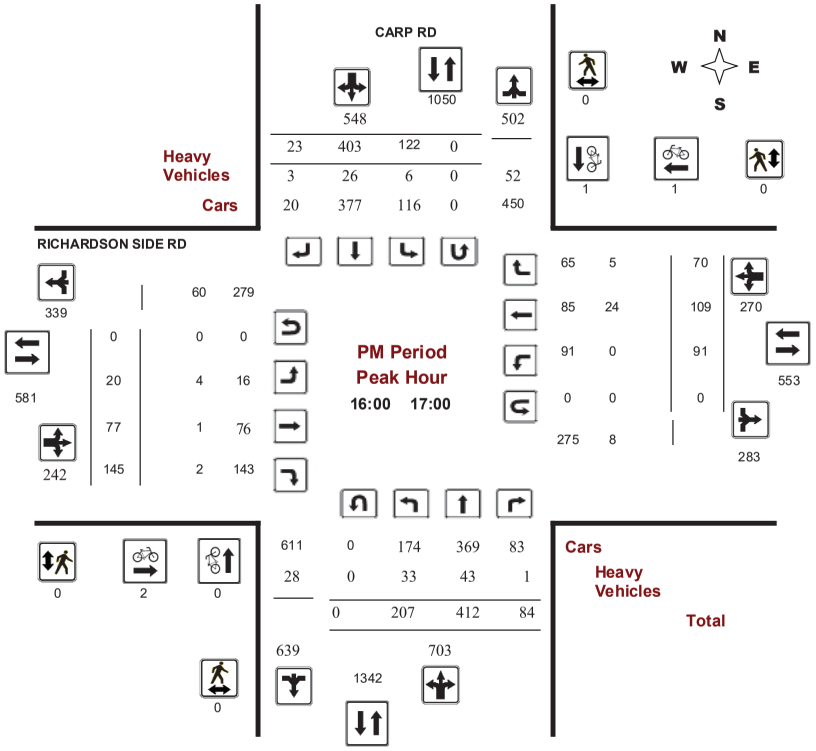
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARP RD @ RICHARDSON SIDE RD

Survey Date: Thursday, May 04, 2017 **WO No:** 36994

Start Time: 07:00 **Device:** Miovision



Transportation Services - Traffic Services

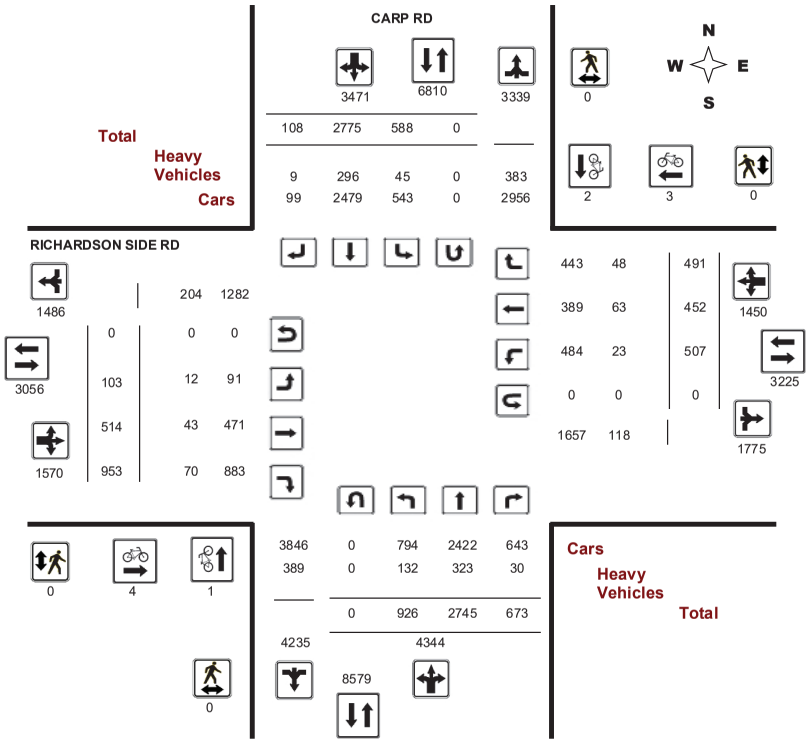
Turning Movement Count - Full Study Diagram

CARP RD @ RICHARDSON SIDE RD

Survey Date: Thursday, May 04, 2017

WO#: 36994

Device: Miovision



Comments

Transportation Services - Traffic Services

Work Order 36994

Turning Movement Count - Full Study Summary Report

CARP RD @ RICHARDSON SIDE RD

Survey Date: Thursday, May 04, 2017

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor .90

Full Study

	CARP RD									RICHARDSON SIDE RD									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	72	413	104	**589**	58	373	9	**440**	**1029**	18	110	170	**298**	31	24	65	**120**	**418**	**1447**
08:00 09:00	92	362	136	**590**	83	337	16	**436**	**1026**	10	87	142	**239**	48	34	47	**129**	**368**	**1394**
09:00 10:00	101	295	85	**481**	40	278	10	**328**	**809**	10	65	153	**228**	53	36	43	**132**	**360**	**1169**
11:30 12:30	78	283	62	**423**	92	339	14	**445**	**868**	9	33	86	**128**	52	38	69	**159**	**287**	**1155**
12:30 13:30	93	314	68	**475**	48	295	9	**352**	**827**	9	45	92	**146**	55	46	62	**163**	**309**	**1136**
15:00 16:00	131	332	56	**519**	75	426	13	**514**	**1033**	12	49	72	**133**	78	84	73	**235**	**368**	**1401**
16:00 17:00	207	412	84	**703**	122	403	23	**548**	**1251**	20	77	145	**242**	91	109	70	**270**	**512**	**1763**
17:00 18:00	152	334	78	**564**	70	324	14	**408**	**972**	15	48	93	**156**	99	81	62	**242**	**398**	**1370**
Sub Total	926	2745	673	**4344**	588	2775	108	**3471**	**7815**	103	514	953	**1570**	507	452	491	**1450**	**3020**	**10835**
U Turns				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	926	2745	673	**4344**	588	2775	108	**3471**	**7815**	103	514	953	**1570**	507	452	491	**1450**	**3020**	**10835**
EQ 12Hr	1287	3816	935	**6038**	817	3857	150	**4825**	**10863**	143	714	1325	**2182**	705	628	682	**2015**	**4197**	**15060**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																	**1.39**		
AVG 12Hr	1158	3434	842	**5434**	736	3472	135	**4342**	**9776**	129	643	1192	**1964**	634	565	614	**1814**	**3778**	**13554**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																	**.90**		
AVG 24Hr	1518	4499	1103	**7119**	964	4548	177	**5688**	**12807**	169	842	1562	**2573**	831	741	805	**2376**	**4949**	**17756**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																	**1.31**		

Comments:

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

W.O. 36994

Turning Movement Count - 15 Minute Summary Report

CARP RD @ RICHARDSON SIDE RD

Survey Date: Thursday, May 04, 2017

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

		CARP RD									RICHARDSON SIDE RD									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	13	99	21	**133**	10	82	0	**92**	**225**	3	18	51	**72**	4	4	9	**17**	**89**	**314**
07:15	07:30	18	109	24	**151**	20	102	2	**124**	**275**	4	29	37	**70**	8	3	14	**25**	**95**	**370**
07:30	07:45	15	81	25	**121**	13	105	4	**122**	**243**	8	28	39	**75**	6	8	20	**34**	**109**	**352**
07:45	08:00	26	124	34	**184**	15	84	3	**102**	**286**	3	35	43	**81**	13	9	22	**44**	**125**	**411**
08:00	08:15	22	104	30	**156**	20	87	6	**113**	**269**	5	24	33	**62**	11	5	12	**28**	**90**	**359**
08:15	08:30	24	93	32	**149**	18	92	1	**111**	**260**	3	19	50	**72**	15	7	7	**29**	**101**	**361**
08:30	08:45	21	84	41	**146**	17	82	4	**103**	**249**	2	20	26	**48**	10	10	17	**37**	**85**	**334**
08:45	09:00	25	81	33	**139**	28	76	5	**109**	**248**	0	24	33	**57**	12	12	11	**35**	**92**	**340**
09:00	09:15	21	81	18	**120**	12	84	3	**99**	**219**	2	16	32	**50**	15	7	8	**30**	**80**	**299**
09:15	09:30	38	72	25	**135**	12	64	2	**78**	**213**	0	18	48	**66**	9	20	10	**39**	**105**	**318**
09:30	09:45	26	65	19	**110**	10	59	0	**69**	**179**	1	19	43	**63**	16	6	6	**28**	**91**	**270**
09:45	10:00	16	77	23	**116**	6	71	5	**82**	**198**	7	12	30	**49**	13	3	19	**35**	**84**	**282**
11:30	11:45	17	54	18	**89**	17	69	3	**89**	**178**	3	13	20	**36**	15	8	18	**41**	**77**	**255**
11:45	12:00	24	77	24	**125**	25	98	4	**127**	**252**	3	6	18	**27**	9	7	12	**28**	**55**	**307**
12:00	12:15	15	68	10	**93**	26	85	5	**116**	**209**	2	8	27	**37**	14	13	21	**48**	**85**	**294**
12:15	12:30	22	84	10	**116**	24	87	2	**113**	**229**	1	6	21	**28**	14	10	18	**42**	**70**	**299**
12:30	12:45	18	69	13	**100**	15	77	2	**94**	**194**	2	15	25	**42**	13	11	13	**37**	**79**	**273**
12:45	13:00	21	77	20	**118**	15	83	3	**101**	**219**	3	13	26	**42**	15	15	12	**42**	**84**	**303**
13:00	13:15	27	78	15	**120**	10	63	0	**73**	**193**	2	7	18	**27**	15	8	26	**49**	**76**	**269**
13:15	13:30	27	90	20	**137**	8	72	4	**84**	**221**	2	10	23	**35**	12	12	11	**35**	**70**	**291**
15:00	15:15	32	84	15	**131**	25	111	6	**142**	**273**	5	13	17	**35**	15	13	13	**41**	**76**	**349**
15:15	15:30	20	75	19	**114**	15	97	4	**116**	**230**	1	10	21	**32**	22	28	17	**67**	**99**	**329**
15:30	15:45	41	84	10	**135**	16	103	1	**120**	**255**	2	8	9	**19**	21	21	26	**68**	**87**	**342**
15:45	16:00	38	89	12	**139**	19	115	2	**136**	**275**	4	18	25	**47**	20	22	17	**59**	**106**	**381**
16:00	16:15	50	80	20	**150**	34	138	4	**176**	**326**	5	20	34	**59**	24	35	20	**79**	**138**	**464**
16:15	16:30	55	100	20	**175**	28	84	6	**118**	**293**	3	19	44	**66**	28	29	16	**73**	**139**	**432**
16:30	16:45	53	129	22	**204**	23	104	9	**136**	**340**	4	19	36	**59**	19	23	20	**62**	**121**	**461**
16:45	17:00	49	103	22	**174**	37	77	4	**118**	**292**	8	19	31	**58**	20	22	14	**56**	**114**	**406**
17:00	17:15	41	69	18	**128**	20	109	3	**132**	**260**	5	17	33	**55**	27	25	17	**69**	**124**	**384**
17:15	17:30	44	90	26	**160**	17	71	4	**92**	**252**	2	14	21	**37**	22	20	14	**56**	**93**	**345**
17:30	17:45	37	101	16	**154**	18	68	4	**90**	**244**	4	9	22	**35**	34	18	15	**67**	**102**	**346**
17:45	18:00	30	74	18	**122**	15	76	3	**94**	**216**	4	8	17	**29**	16	18	16	**50**	**79**	**295**
TOTAL:		926	2745	673	**4344**	588	2775	108	**3471**	**7815**	103	514	953	**1570**	507	452	491	**1450**	**3020**	**10835**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order 36994

CARP RD @ RICHARDSON SIDE RD

Count Date: Thursday, May 04, 2017 **Start Time:** 07:00

	CARP RD			RICHARDSON SIDE RD			
Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 08:00	0	0	**0**	1	1	**2**	**2**
08:00 09:00	0	0	**0**	0	0	**0**	**0**
09:00 10:00	1	0	**1**	0	0	**0**	**1**
11:30 12:30	0	0	**0**	0	0	**0**	**0**
12:30 13:30	0	0	**0**	1	0	**1**	**1**
15:00 16:00	0	1	**1**	0	0	**0**	**1**
16:00 17:00	0	1	**1**	2	1	**3**	**4**
17:00 18:00	0	0	**0**	0	1	**1**	**1**
Total	1	2	**3**	4	3	**7**	**10**

Comment:

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

W.O. 36994

Turning Movement Count - Heavy Vehicle Report

CARP RD @ RICHARDSON SIDE RD

Survey Date: Thursday, May 04, 2017

		CARP RD									RICHARDSON SIDE RD									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	08:00	8	37	9	**54**	13	63	1	**77**	**131**	1	28	18	**47**	1	3	3	**7**	**54**	**185**
08:00	09:00	19	50	6	**75**	9	41	1	**51**	**126**	2	2	11	**15**	6	10	5	**21**	**36**	**162**
09:00	10:00	34	53	3	**90**	2	48	2	**52**	**142**	1	7	11	**19**	8	18	9	**35**	**54**	**196**
11:30	12:30	9	38	4	**51**	2	46	1	**49**	**100**	1	2	10	**13**	3	3	10	**16**	**29**	**129**
12:30	13:30	12	35	4	**51**	7	28	1	**36**	**87**	2	2	13	**17**	3	0	3	**6**	**23**	**110**
15:00	16:00	12	43	3	**58**	4	32	0	**36**	**94**	1	1	4	**6**	1	5	10	**16**	**22**	**116**
16:00	17:00	33	43	1	**77**	6	26	3	**35**	**112**	4	1	2	**7**	0	24	5	**29**	**36**	**148**
17:00	18:00	5	24	0	**29**	2	12	0	**14**	**43**	0	0	1	**1**	1	0	3	**4**	**5**	**48**
Sub Total		132	323	30	**485**	45	296	9	**350**	**835**	12	43	70	**125**	23	63	48	**134**	**259**	**1094**
U-Turns (Heavy Vehicles)					**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total		132	323	30	**0**	45	296	9	**350**	**835**	12	43	70	**125**	23	63	48	**134**	**259**	**1094**

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

Work Order 36994

Turning Movement Count - Pedestrian Volume Report

CARP RD @ RICHARDSON SIDE RD

Count Date: Thursday, May 04, 2017 **Start Time:** 07:00

Time Period		NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00	07:15	0	0	**0**	0	0	**0**	**0**
07:15	07:30	0	0	**0**	0	0	**0**	**0**
07:30	07:45	0	0	**0**	0	0	**0**	**0**
07:45	08:00	0	0	**0**	0	0	**0**	**0**
07:00	08:00	0	0	**0**	0	0	**0**	**0**
08:00	08:15	0	0	**0**	0	0	**0**	**0**
08:15	08:30	0	0	**0**	0	0	**0**	**0**
08:30	08:45	0	0	**0**	0	0	**0**	**0**
08:45	09:00	0	0	**0**	0	0	**0**	**0**
08:00	09:00	0	0	**0**	0	0	**0**	**0**
09:00	09:15	0	0	**0**	0	0	**0**	**0**
09:15	09:30	0	0	**0**	0	0	**0**	**0**
09:30	09:45	0	0	**0**	0	0	**0**	**0**
09:45	10:00	0	0	**0**	0	0	**0**	**0**
09:00	10:00	0	0	**0**	0	0	**0**	**0**
11:30	11:45	0	0	**0**	0	0	**0**	**0**
11:45	12:00	0	0	**0**	0	0	**0**	**0**
12:00	12:15	0	0	**0**	0	0	**0**	**0**
12:15	12:30	0	0	**0**	0	0	**0**	**0**
11:30	12:30	0	0	**0**	0	0	**0**	**0**
12:30	12:45	0	0	**0**	0	0	**0**	**0**
12:45	13:00	0	0	**0**	0	0	**0**	**0**
13:00	13:15	0	0	**0**	0	0	**0**	**0**
13:15	13:30	0	0	**0**	0	0	**0**	**0**
12:30	13:30	0	0	**0**	0	0	**0**	**0**
15:00	15:15	0	0	**0**	0	0	**0**	**0**
15:15	15:30	0	0	**0**	0	0	**0**	**0**
15:30	15:45	0	0	**0**	0	0	**0**	**0**
15:45	16:00	0	0	**0**	0	0	**0**	**0**
15:00	16:00	0	0	**0**	0	0	**0**	**0**
16:00	16:15	0	0	**0**	0	0	**0**	**0**
16:15	16:30	0	0	**0**	0	0	**0**	**0**
16:30	16:45	0	0	**0**	0	0	**0**	**0**
16:45	17:00	0	0	**0**	0	0	**0**	**0**
16:00	17:00	0	0	**0**	0	0	**0**	**0**
17:00	17:15	0	0	**0**	0	0	**0**	**0**
17:15	17:30	0	0	**0**	0	0	**0**	**0**
17:30	17:45	0	0	**0**	0	0	**0**	**0**
17:45	18:00	0	0	**0**	0	0	**0**	**0**
17:00	18:00	0	0	**0**	0	0	**0**	**0**
Total	.....	0	0	**0**	0	0	**0**	**0**

Comment:

Transportation Services - Traffic Services

Work Order
36994

Turning Movement Count - 15 Min U-Turn Total Report

CARP RD @ RICHARDSON SIDE RD

Survey Date: Thursday, May 04, 2017

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		0	0	0	0	0

Appendix C

Synchro Worksheets – Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	116	152	38	25	68	81	418	113	68	378	15
Future Volume (vph)	20	116	152	38	25	68	81	418	113	68	378	15
Satd. Flow (prot)	0	1616	0	0	1600	0	1658	1689	0	1658	1735	0
Flt Permitted		0.971			0.690		0.472			0.368		
Satd. Flow (perm)	0	1574	0	0	1120	0	824	1689	0	642	1735	0
Satd. Flow (RTOR)		60			58			19			3	
Lane Group Flow (vph)	0	320	0	0	146	0	90	590	0	76	437	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	27.5	27.5		27.5	27.5		62.0	62.0		62.0	62.0	
Total Split (s)	45.5	45.5		45.5	45.5		62.0	62.0		62.0	62.0	
Total Split (%)	42.3%	42.3%		42.3%	42.3%		57.7%	57.7%		57.7%	57.7%	
Yellow Time (s)	3.7	3.7		3.7	3.7		4.6	4.6		4.6	4.6	
All-Red Time (s)	1.8	1.8		1.8	1.8		1.4	1.4		1.4	1.4	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5			5.5		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		20.0			20.0		56.3	56.3		56.3	56.3	
Actuated g/C Ratio		0.23			0.23		0.64	0.64		0.64	0.64	
v/c Ratio		0.79			0.49		0.17	0.54		0.18	0.39	
Control Delay		40.2			23.1		9.0	11.9		9.6	9.9	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		40.2			23.1		9.0	11.9		9.6	9.9	
LOS		D			C		A	B		A	A	
Approach Delay		40.2			23.1			11.5			9.9	
Approach LOS		D			C			B			A	
Queue Length 50th (m)		43.6			13.1		5.7	49.2		4.9	32.7	
Queue Length 95th (m)		73.3			30.7		16.4	102.9		15.0	68.1	
Internal Link Dist (m)		335.7			351.7			322.4			371.5	
Turn Bay Length (m)							54.0			95.0		
Base Capacity (vph)		752			544		527	1089		411	1112	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.43			0.27		0.17	0.54		0.18	0.39	

Intersection Summary
Cycle Length: 107.5
Actuated Cycle Length: 87.8
Natural Cycle: 90
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.79

Intersection Signal Delay: 17.6 Intersection LOS: B
Intersection Capacity Utilization 73.7% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: Carp & Richardson Side

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	77	145	91	109	70	207	412	84	122	403	23
Future Volume (vph)	20	77	145	91	109	70	207	412	84	122	403	23
Satd. Flow (prot)	0	1597	0	0	1655	0	1658	1701	0	1658	1731	0
Flt Permitted		0.960			0.667		0.427			0.372		
Satd. Flow (perm)	0	1540	0	0	1123	0	745	1701	0	649	1731	0
Satd. Flow (RTOR)		80			19			14			4	
Lane Group Flow (vph)	0	269	0	0	300	0	230	551	0	136	474	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	27.5	27.5		27.5	27.5		62.0	62.0		62.0	62.0	
Total Split (s)	45.5	45.5		45.5	45.5		62.0	62.0		62.0	62.0	
Total Split (%)	42.3%	42.3%		42.3%	42.3%		57.7%	57.7%		57.7%	57.7%	
Yellow Time (s)	3.7	3.7		3.7	3.7		4.6	4.6		4.6	4.6	
All-Red Time (s)	1.8	1.8		1.8	1.8		1.4	1.4		1.4	1.4	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5			5.5		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		26.2			26.2		56.4	56.4		56.4	56.4	
Actuated g/C Ratio		0.28			0.28		0.60	0.60		0.60	0.60	
v/c Ratio		0.55			0.92		0.52	0.54		0.35	0.46	
Control Delay		23.8			64.4		18.6	15.0		15.2	13.8	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		23.8			64.4		18.6	15.0		15.2	13.8	
LOS		C			E		B	B		B	B	
Approach Delay		23.8			64.4			16.1			14.1	
Approach LOS		C			E			B			B	
Queue Length 50th (m)		30.0			52.1		23.3	55.2		12.0	45.1	
Queue Length 95th (m)		53.8			86.8		62.1	116.8		34.1	95.0	
Internal Link Dist (m)		335.7			351.7			322.4			371.5	
Turn Bay Length (m)							54.0			95.0		
Base Capacity (vph)		704			491		446	1024		388	1038	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.38			0.61		0.52	0.54		0.35	0.46	

Intersection Summary
Cycle Length: 107.5
Actuated Cycle Length: 94.2
Natural Cycle: 90
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.92

Intersection Signal Delay: 23.9 Intersection LOS: C
Intersection Capacity Utilization 86.5% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Carp & Richardson Side

Appendix D

Collision Data

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Traffic Control Condition	Classification Of Accident	Initial Impact Type	Road Surface Condition
2015-03-20	2015	9:01	CARDEVCO RD @ CARP RD	01 - Clear	01 - Daylight	02 - Stop sign		02 - Non-fatal injury	99 - Other	01 - Dry
2017-10-05	2017	13:45	CARDEVCO RD @ CARP RD	01 - Clear	01 - Daylight	02 - Stop sign		03 - P.D. only	03 - Rear end	01 - Dry
2017-09-28	2017	12:30	CARDEVCO RD @ CARP RD	01 - Clear	01 - Daylight	02 - Stop sign		02 - Non-fatal injury	03 - Rear end	01 - Dry
2015-10-16	2015	10:55	CARP RD @ CAVANMORE RD	01 - Clear	01 - Daylight	02 - Stop sign		02 - Non-fatal injury	05 - Turning movement	01 - Dry
2014-03-27	2014	21:30	CARP RD @ RICHARDSON SIDE RD	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
2014-04-29	2014	13:30	CARP RD @ RICHARDSON SIDE RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2014-08-28	2014	17:51	CARP RD @ RICHARDSON SIDE RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	05 - Turning movement	01 - Dry
2014-11-07	2014	11:22	CARP RD @ RICHARDSON SIDE RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
2015-01-28	2015	8:28	CARP RD @ RICHARDSON SIDE RD	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	02 - Angle	01 - Dry
2016-09-03	2016	17:03	CARP RD @ RICHARDSON SIDE RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	07 - SMV other	01 - Dry
2016-06-13	2016	8:08	CARP RD @ RICHARDSON SIDE RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	05 - Turning movement	01 - Dry
2016-06-29	2016	17:15	CARP RD @ RICHARDSON SIDE RD	02 - Rain	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	02 - Wet
2017-11-17	2017	13:45	CARP RD @ RICHARDSON SIDE RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
2017-03-19	2017	1:18	CARP RD @ RICHARDSON SIDE RD	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	07 - SMV other	01 - Dry
2013-05-16	2013	16:09	CARP RD @ RICHARDSON SIDE RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	05 - Turning movement	01 - Dry
2013-06-23	2013	8:30	CARP RD @ RICHARDSON SIDE RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
2013-10-09	2013	19:00	CARP RD @ RICHARDSON SIDE RD	01 - Clear	05 - Dusk	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2015-05-11	2015	16:15	CARP RD @ WESTHUNT RD	01 - Clear	01 - Daylight	02 - Stop sign		03 - P.D. only	02 - Angle	01 - Dry
2016-06-20	2016	8:37	CARP RD btwn CARDEVCO RD & WESTHUNT RD	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
2016-06-22	2016	22:00	CARP RD btwn CARDEVCO RD & WESTHUNT RD	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2013-07-16	2013	4:50	CARP RD btwn CAVANMORE RD & CARDEVCO RD	01 - Clear	03 - Dawn	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2017-08-04	2017	22:00	CARP RD btwn REIS RD & CAVANMORE RD	02 - Rain	07 - Dark	10 - No control		03 - P.D. only	07 - SMV other	02 - Wet
2013-02-06	2013	8:41	CARP RD btwn REIS RD & CAVANMORE RD	05 - Drifting Snow	01 - Daylight	10 - No control		03 - P.D. only	07 - SMV other	03 - Loose snow
2013-06-19	2013	15:23	CARP RD btwn REIS RD & CAVANMORE RD	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2013-10-31	2013	6:55	CARP RD btwn REIS RD & CAVANMORE RD	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	99 - Other	02 - Wet
2014-04-16	2014	7:44	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	03 - Rear end	01 - Dry
2015-07-07	2015	12:59	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2015-12-30	2015	6:11	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	04 - Freezing Rain	07 - Dark	10 - No control		03 - P.D. only	03 - Rear end	06 - Ice
2017-09-11	2017	11:17	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
2017-10-30	2017	11:33	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	02 - Rain	01 - Daylight	10 - No control		03 - P.D. only	07 - SMV other	02 - Wet
2017-11-29	2017	6:30	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	02 - Rain	03 - Dawn	10 - No control		03 - P.D. only	07 - SMV other	02 - Wet
2017-12-14	2017	10:01	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
2017-01-22	2017	13:45	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	02 - Wet
2017-04-18	2017	7:45	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
2013-01-10	2013	12:00	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	99 - Other	02 - Wet
2013-02-28	2013	6:20	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	03 - Snow	07 - Dark	10 - No control		03 - P.D. only	01 - Approaching	03 - Loose snow
2013-03-28	2013	14:10	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	05 - Turning movement	01 - Dry
2014-01-27	2014	13:08	RICHARDSON SIDE RD btwn CARDEVCO RD & CARP RD	03 - Snow	01 - Daylight	10 - No control		03 - P.D. only	07 - SMV other	03 - Loose snow
2014-05-08	2014	20:11	RICHARDSON SIDE RD btwn CARDEVCO RD & CARP RD	02 - Rain	05 - Dusk	10 - No control		03 - P.D. only	07 - SMV other	02 - Wet
2015-11-29	2015	17:09	RICHARDSON SIDE RD btwn CARDEVCO RD & CARP RD	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2013-05-19	2013	15:57	RICHARDSON SIDE RD btwn CARDEVCO RD & CARP RD	02 - Rain	01 - Daylight	10 - No control		02 - Non-fatal injury	01 - Approaching	02 - Wet
2013-11-28	2013	6:42	RICHARDSON SIDE RD btwn CARDEVCO RD & CARP RD	01 - Clear	03 - Dawn	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2013-12-05	2013	20:11	RICHARDSON SIDE RD btwn CARDEVCO RD & CARP RD	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	07 - SMV other	02 - Wet
2014-03-13	2014	2:01	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	05 - Drifting Snow	07 - Dark	10 - No control		03 - P.D. only	07 - SMV other	05 - Packed snow
2014-08-09	2014	9:34	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2015-11-13	2015	13:46	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	02 - Rain	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	02 - Wet
2016-01-18	2016	10:08	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	07 - SMV other	03 - Loose snow
2016-10-27	2016	7:36	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2016-05-13	2016	17:17	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	05 - Turning movement	01 - Dry
2017-09-29	2017	0:00	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	01 - Clear	00 - Unknown	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2017-03-06	2017	22:30	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	04 - Freezing Rain	07 - Dark	10 - No control		03 - P.D. only	07 - SMV other	06 - Ice
2013-08-12	2013	16:35	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	02 - Wet
2013-10-28	2013	9:42	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2013-12-09	2013	7:50	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	03 - Snow	03 - Dawn	10 - No control		03 - P.D. only	01 - Approaching	03 - Loose snow

Appendix E

Site Vehicle Operation Estimates

Andrew Harte

From: Christopher Gordon
Sent: January 28, 2019 6:23 AM
To: Andrew Harte
Subject: FW: ECA follow up noise questions
Attachments: Car Road RMX Traffic Routes.docx; DRAFT Site Plan - Employee Parking Option 1.pdf

Christopher Gordon, P.Eng.
CGH Transportation Inc.
P: 343-999-9117
E: Christopher.Gordon@CGHTransportation.com

From: Angela Jonkman <ajonkman@rcii.com>
Sent: January 25, 2019 2:19 PM
To: Christopher Gordon <christopher.gordon@cghtransportation.com>
Subject: FW: ECA follow up noise questions

Chris,

See email below from Cavanagh. Cavanagh felt that the information might necessary/helpful for you while you are preparing your proposal.

Angela Jonkman, P.Eng. | Senior Project Manager

From: Ben Houle [mailto:BHoule@thomascavanagh.ca]
Sent: January-25-19 1:47 PM
To: Angela Jonkman
Cc: Chris Collins
Subject: FW: ECA follow up noise questions

Angela,

I was looking back through my emails and found the following breakdown regarding the number of anticipated trip generations from the Concrete Plant.

Hopefully this can aid Chris Gordon in the preparation of his report.

Please let us know if you require any additional information.

Regards,

Ben Houle, P. Eng.
Project Engineer, Land Development
bhoule@thomascavanagh.ca

O: (613) 257-2918 | C: (613) 227-5162 |

From: Kevin Brennan <KBrennan@cavanaghconcrete.ca>
Sent: June-14-18 11:30 AM
To: Phil White <PWhite@thomascavanagh.ca>
Cc: Ben Houle <BHoule@thomascavanagh.ca>
Subject: RE: ECA follow up noise questions

Hi Phil,

	Maximum Number of Vehicles per hour				
Operations	**Aggregate Trucks**	**Cement Tanker Trucks**	**Sand Trucks**	**Ready-Mix Concrete trucks**	**Loaders**
Daytime [7am - 7pm]	6	3	6	14	2
Evening [7pm - 11pm]	4	2	4	12	1
Night Time [11pm - 7am]	0	1	0	6	1