Luca and Ray Angod

City of Kitchener

Biehn Drive Extension Delegation

Methodology and
Adherence to Guidelines

December 16, 2024

Who Will Use This Road? Current Residents

I went to Neighbourhood 3 and asked 21 people these 2 questions:

1. When you drive, what percent of the time do you go south on Biehn Drive toward Caryndale?

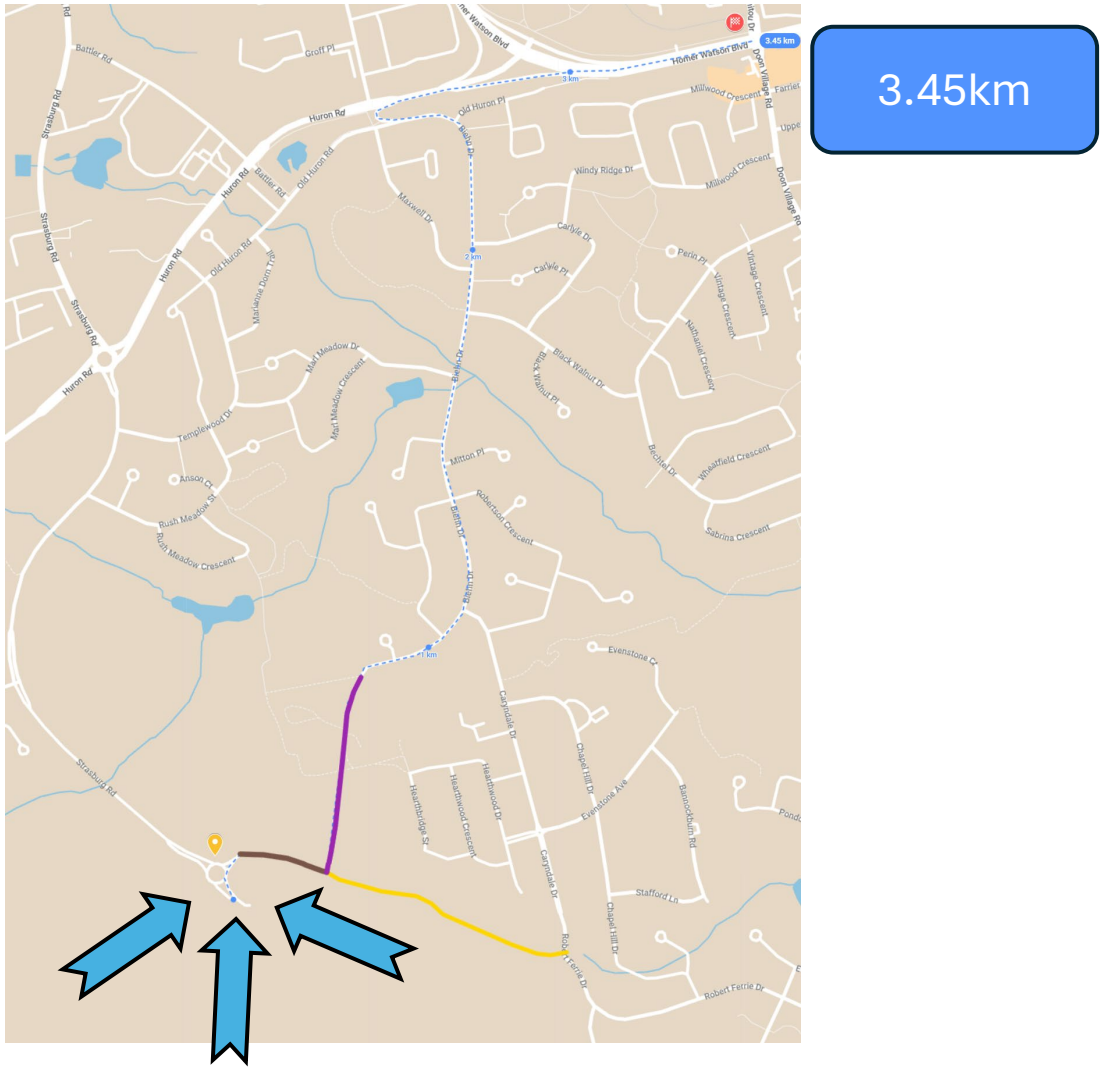
2. If Biehn Drive is extended, what percent of the time will you use it?

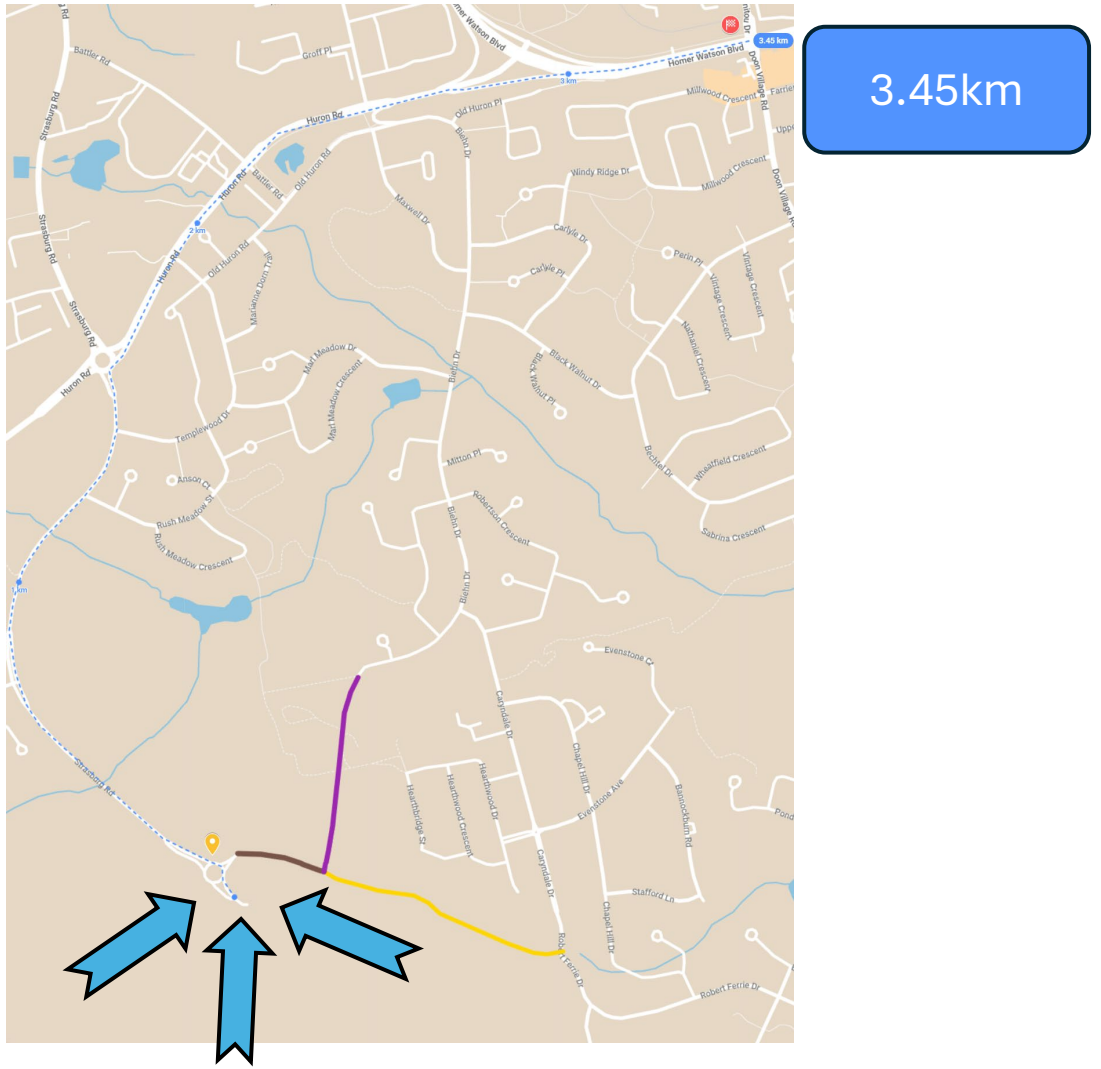
My Findings

	% trips south on Biehn
Study Mean	21%
ESR	50%

ESR total trips estimate is **25 times higher** than people's responses

Who Will Use This Road? Future Residents





Distance is the same, but the Strasburg route has faster roads.

Which route would you take?

Can you find a destination where Biehn Dr is the best route?

Who Will Use This Road?

Current residents say they won’t use it
Future residents don’t need it

Why does the report say that people will use it?

Transportation Impact Study Guidelines

The City of Kitchener utilizes the Regional Municipality of Waterloo's Transportation Impact Study (TIS) Guidelines adopted November 2008 and can be found on the Region's website.

Region of Waterloo

AS ADOPTED BY REGION OF WATERLOO COUNCIL
SEPTEMBER 18, 2013 REPORT NO. P-13-088

HOUSEKEEPING EDITS APPLIED
UPDATED TO FILE VERSION 4, JULY 22, 2014

The TIS is an important tool in the overall development planning process. It assists developers and public agencies in making land use decisions, and provides information that identifies the impacts of proposed development on the existing streets and circulation networks and recommends mitigation measures for the impacts identified.

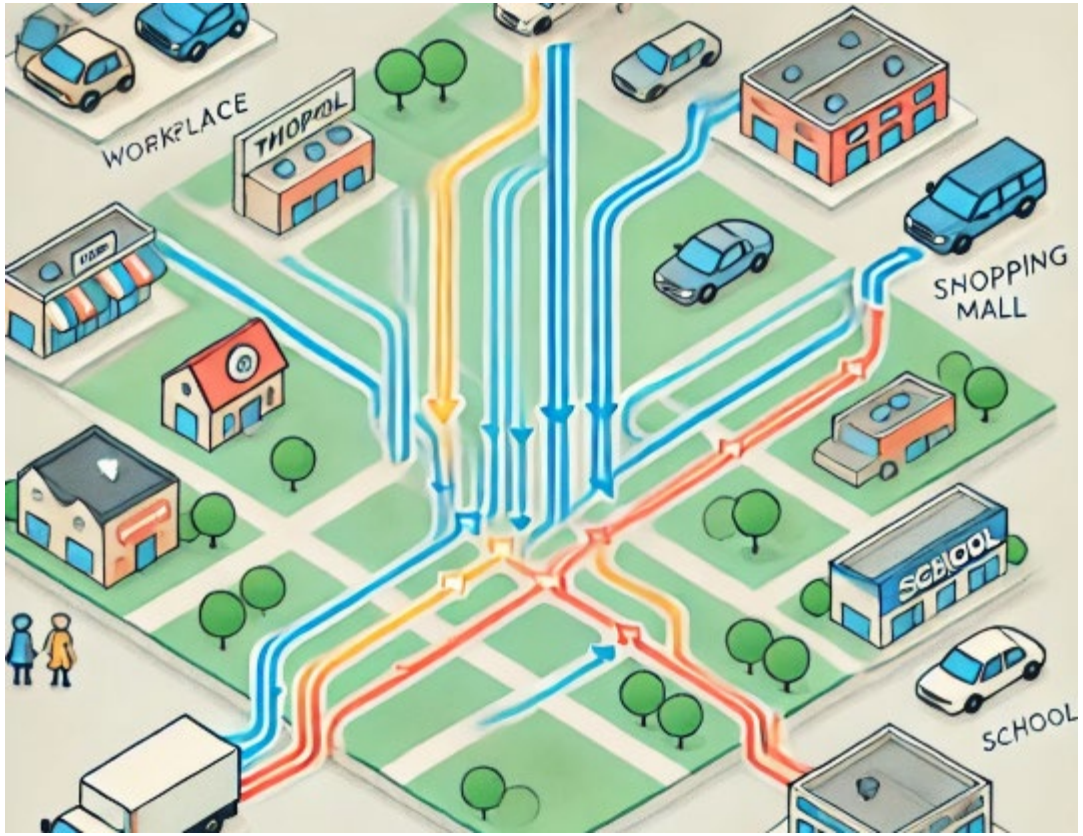
2.2 Key Issues and Constraints

Planned/Proposed Development: The extension of Biehn Drive will need to consider any proposed plans of subdivision and the potential network of future local streets.

https://www.regionofwaterloo.ca/en/living-here/resources/Design-Standards/Transportation-Impact-Study-Guidelines.pdf
https://www.kitchener.ca/en/resourcesGeneral/Documents/DSD_ENG_Development_Manual_2021.pdf

2 Key Concepts

Trip Generation Rate: The average number of trips to/from an area



Trip Distribution: How trips flow between origins and destinations

Trip Generation - Guidelines

Region of Waterloo Transportation Impact Study Guidelines

APPENDIX B:
FORMAT FOR TRIP GENERATION TABLES

Land Use	ITE Code	Size	AM Peak Hour				PM Peak Hour			
			Rate/Equation	In	Out	Total	Rate/Equation	In	Out	Total

Biehn Drive Extension Traffic Study

Table 2: BTE Trip Generation Rates of Existing Neighbourhoods (2024)

Neighbourhood	Approximate Number of Dwelling Units	ITE Trip Generation Rate	Total Daily Vehicle Trips
Neighbourhood 1 (Biehn Drive North Neighbourhood)	260	Single-Family Detached Housing 9.43 Daily Trip Generation Rate/Dwelling Unit	2452
Neighbourhood 2 (Marl Meadow Neighbourhood)	475		4480
Neighbourhood 3 (Biehn Drive South Neighborhood)	265		2490
Neighbourhood 4 (Caryndale Neighbourhood)	225		2122

https://www.regionofwaterloo.ca/en/living-here/resources/Design-Standards/Transportation-Impact-Study-Guidelines.pdf
https://pub-kitchener.escribemeetings.com/filestream.ashx?DocumentId=22750

Trip Generation Comparables

Kitchener, ON (2023)

Land Uses	GFA (Dwelling Units)	Parameters	Peak Hour					
			Weekday AM ☑			Weekday PM ☑		
			In ☑	Out	Total	In	Out	Total
Low-Rise Residential (LUC 220)	210 units	Trip Ratio	24%	76%	100%	63%	37%	100%
		Gross Trips	21	67	88	70	41	111
Total Primary Trips			***21***	***67***	***88***	***70***	***41***	***111***

https://pub-kitchener.escribemeetings.com/filestream.ashx?DocumentId=16620

Trip Generation Comparables

Mississauga, ON (2021)

Land Use		Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Residential Condominium	Units: 207						
ITE Code 221	Distribution	26%	74%	100%	61%	39%	100%
Multifamily Housing	Equation	Ln(T)= 0.98Ln(X)-0.98			Ln(T)= 0.96Ln(X)-0.63		
(Mid-Rise)	Rate	0.09	0.25	0.34	0.26	0.17	0.43
	Trips	**18**	**52**	**70**	**54**	**35**	**89**

https://www.mississauga.ca/wp-content/uploads/2022/04/06115838/W8_2935_Traffic_Impact_Study_March2022.pdf

Trip Generation Comparables

Guelph, ON (2006)

Proposed Industrial Development – 1,200,000 ft²	WEEKDAY AM Peak Hour			WEEKDAY PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Directional Distribution	88%	12%	100%	12%	88%	100%
Trip Rate (per 1,000 ft²)	0.88	0.12	1.00	0.12	0.88	1.00
Gross Trips	1055	145	1200	145	1055	1200
Net New Trips	**1055**	**145**	**1200**	**145**	**1055**	**1200**

https://guelph.ca/wp-content/uploads/Lefarge_TrafficImpactStudy.pdf

Trip Generation Comparables

St. Johns, NL (2008)

Table 4 - Trip Generation Estimates for Pleasantville Redevelopment

Land Use[1]	Number Units[1]	Trip Generation Rates[2]					Trips Generated[3]				
		AM Peak		PM Peak		Day	AM Peak		PM Peak		Day
		In	Out	In	Out	2-Way	In	Out	In	Out	2-Way
Land Use and Trip Generation Estimates for Phases 1 to 4 - 2010											
SingleFamily (ITE 210)	174 Units	0.19	0.56	0.64	0.37	9.57	33	97	111	64	1665
Apartment (ITE 220)	338 Apts	0.10	0.41	0.40	0.22	6.72	34	139	135	74	2271
Hi-Rise Apt (ITE 222)	181 Apts	0.08	0.22	0.21	0.14	4.20	14	40	38	25	760
Total Residential	693						81	276	284	163	4696
Phase 1a Retail[5] (ITE 820)	45.75 KGLA	0.63	0.40	1.80	1.95	42.94	29	18	82	89	1965
Phase 1a Offices[5] (ITE 710)	45.75 KGFA	1.36	0.19	0.25	1.24	11.01	62	9	11	57	504
Phase 1b Retail[5] (ITE 820)	10.75 KGLA	0.63	0.40	1.80	1.95	42.94	7	4	19	21	462
Phase 1b Offices[5] (ITE 710)	10.75 KGFA	1.36	0.19	0.25	1.24	11.01	15	2	3	13	118
Total Commercial	113						113	33	115	180	3049
Total Estimated Trips for Phases 1 to 4							194	309	399	343	7745
Land Use and Trip Generation Estimates for Phases 5 and 6 - 2012											
SingleFamily (ITE 210)	20 Units	0.19	0.56	0.64	0.37	9.57	4	11	13	7	191
Apartment (ITE 220)	93 Apts	0.10	0.41	0.40	0.22	6.72	9	38	37	20	625
Hi-Rise Apt (ITE 222)	181 Apts	0.08	0.22	0.21	0.14	4.20	14	40	38	25	760
Total Residential	294						27	89	88	52	1576
Phase 5a / 5b Retail[6] (ITE 820)	17.5 KGLA	0.63	0.40	1.80	1.95	42.94	11	7	32	34	751
Phase 5a / 5b Offices[6] (ITE 710)	17.5 KGFA	1.36	0.19	0.25	1.24	11.01	24	3	4	22	193
Total Commercial	35						35	10	36	56	944
Total Estimated Trips for Phases 5 and 6							62	99	124	108	2520

Land Use and Trip Generation Estimates for Full Development											
Total Residential	987						108	365	372	215	6272
Total Commercial	148						148	43	151	236	3993
Total Estimated Trips for Full Development							256	408	523	451	10265

https://www.stjohns.ca/en/streets-parking/resources/Documents/Traffic-Studies/TrafficImpactStudyPleasantvilleRedevelopment_1.pdf

Trip Generation Comparables

Penetanguishene, ON (2023)

LAND USE	RATE/ ESTIMATE	VARIABLE/ SIZE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			In	Out	Total	In	Out	Total
single family detached (ITE 210)	rate	units	0.18	0.52	0.70	0.59	0.35	0.94
	estimate	29	5	15	20	17	10	27

https://www.connectpenetanguishene.ca/42138/widgets/178216/documents/129261

Trip Generation Comparables

Wellington, ON (2023)

ITE Code	AM Trips ☑			PM Trips ☑		
	Avg Rate	% Enter ☑	% Exit	Avg Rate	% Enter	% Exit
210 – Single-Family Detached	0.76	26	74	1.00	64	36
220 – Multifamily (Low-Rise)	0.56	28	72	0.67	59	41

https://www.thecounty.ca/wp-content/uploads/2024/06/Traffic-Impact-Study.pdf

Trip Generation Comparables

Kitchener, ON (2024)

Table 2: BTE Trip Generation Rates of Existing Neighbourhoods (2024)			
Neighbourhood	**Approximate Number of Dwelling Units**	**ITE Trip Generation Rate**	**Total Daily Vehicle Trips**
Neighbourhood 1 (Biehn Drive North Neighbourhood)	260	Single-Family Detached Housing 9.43 Daily Trip Generation Rate/Dwelling Unit	2452
Neighbourhood 2 (Marl Meadow Neighbourhood)	475		4480
Neighbourhood 3 (Biehn Drive South Neighborhood)	265		2490
Neighbourhood 4 (Caryndale Neighbourhood)	225		2122

https://pub-kitchener.escribemeetings.com/filestream.ashx?DocumentId=22832

Trip Distribution - Guidelines

Region of Waterloo Transportation Impact Study Guidelines

APPENDIX C:
FORMAT FOR TRIP DISTRIBUTION TABLES

Origin / Destination	Percent Distribution			
	AM Peak Hour		PM Peak Hour	
To / From the North:	In	Out	In	Out
Via Via Street A				
Via Via Street B				
Via Via Street C etc...				

trip distribution are attached as Appendices C and D. The trip distribution table should be accompanied by a trip distribution map.

Biehn Drive Extension Traffic Study

Table 3: BTE Trip Distribution and Assignment (2024)

Scenario	Origin / Destination Neighbourhood	Distribution		Number of Vehicle Trips
Scenario 1 – Extension of Biehn Drive (Location – Current Biehn Drive Terminus)	Neighbourhood 2 (Marl Meadow Neighbourhood)	Trips to/from the south via Robert Ferrie Drive	5%	224
	Neighbourhood 3 (Biehn Drive South Neighborhood)	Trips to/from the south Robert Ferrie Drive	90%	2,258
			Total=	2,482

[1] https://www.regionofwaterloo.ca/en/living-here/resources/Design-Standards/Transportation-Impact-Study-Guidelines.pdf
[2] https://pub-kitchener.escribemeetings.com/filestream.ashx?DocumentId=22750

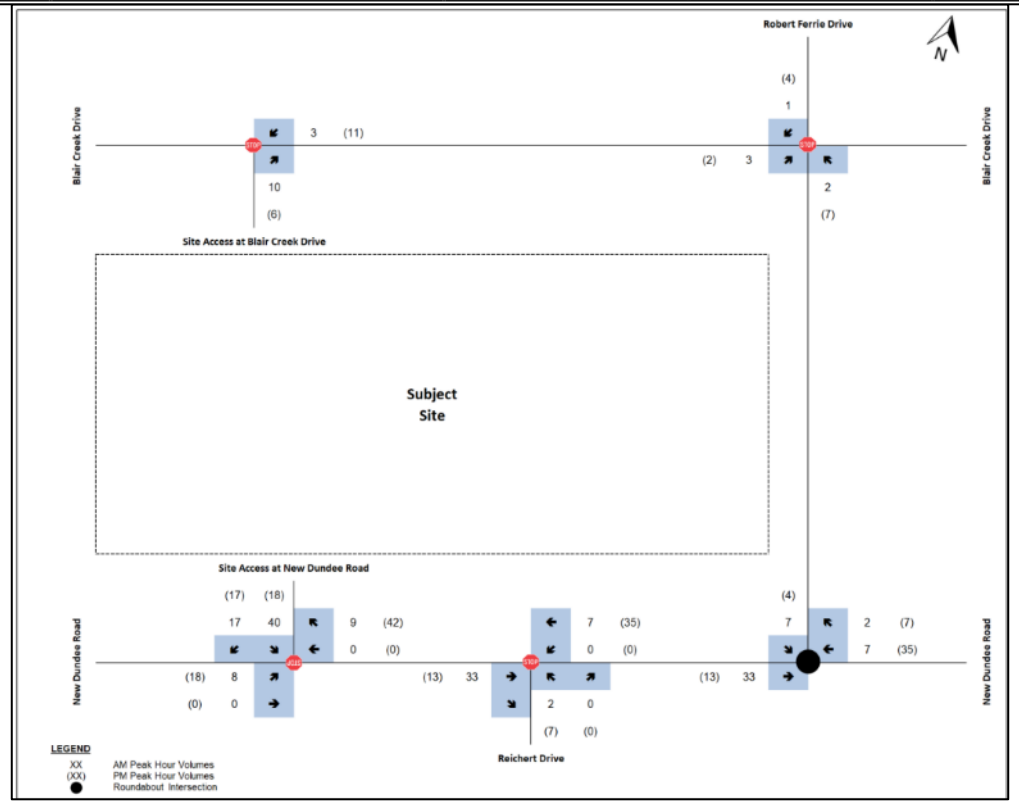
Trip Distribution Comparables

Kitchener, ON (2023)

Site generated traffic for the residential development was distributed mainly based on a review of the existing travel patterns and confirmed with the 2016 Transportation Tomorrow Survey (TTS) data for residential trips for the study

Table 2 Directional Trip Distribution of Site Traffic (Residential)

Peak Period	Direction	North (Robert Ferrie)	South (Reichert)	East (New Dundee)	West (New Dundee)
AM ☑	Inbound ☑	5%	10%	45%	40%
	Outbound	5%	10%	60%	25%
PM ☑	Inbound	5%	10%	60%	43%
	Outbound	5%	10%	25%	42%



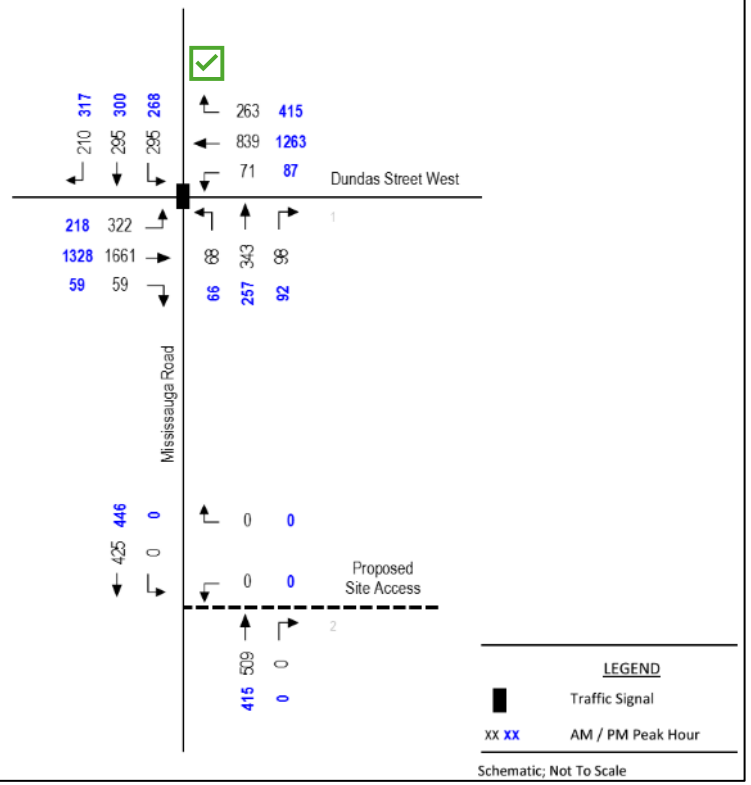
https://pub-kitchener.escribemeetings.com/filestream.ashx?DocumentId=16620

Trip Distribution Comparables

Mississauga, ON (2021)

Site trips for the proposed development (residential uses) were distributed to / from the site and the boundary roadways using 2016 TTS data and existing travel patterns. Details are provided in Appendix C.

Figure 6: Future Background Traffic Volumes, Weekday AM and PM Peak Hours



Cross Tabulation Query Form - Trip - 2016 v1.1

Row: Planning district of destination - pd_dest
Column: 2006 GTA zone of origin - gta06_orig
Table: Primary travel mode of trip - mode_prime
Filters:
(2006 GTA zone of origin - gta06_orig In 3650
Primary travel mode of trip - mode_prime In D
Start time of trip - start_time In 600-900)

	North 31%		
West 19%		37%	East
	South 14%		

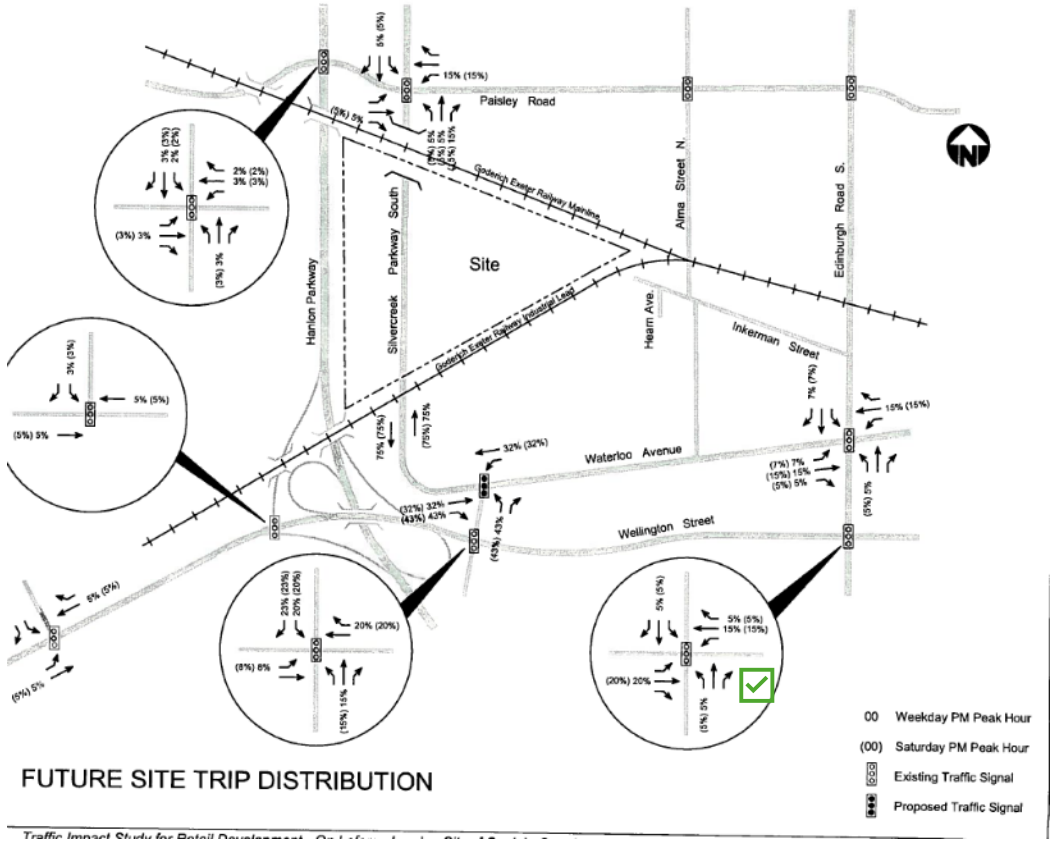
Destination Zone	No. of Trips from City of Mississauga 2006 GTA Zone 3650	Percent of Trips from City of Mississauga 2006 GTA Zone 3650	Location respect to site
PD 1 of Toronto	121	5%	E
PD 2 of Toronto	10	0%	E
PD 3 of Toronto	10	0%	E
PD 4 of Toronto	20	1%	E
PD 6 of Toronto	15	1%	E
PD 8 of Toronto	217	9%	E
PD 9 of Toronto	85	4%	E
PD 10 of Toronto	30	1%	E
PD 13 of Toronto	5	0%	E
PD 16 of Toronto	45	2%	E
Vaughan	58	2%	E
Caledon	7	0%	N
Brampton	56	2%	N
Mississauga			
136	141	6%	E
137	341	14%	S
138	33	1%	E
139	94	4%	E
140	384	16%	N
141	61	3%	N
142	44	2%	N
143	491	-	Internal
144	165	7%	N
146	15	1%	N
Halton Hills	7	0%	N
Oakville	283	12%	W
Burlington	60	2%	W
Hamilton	94	4%	W
Cambridge	16	1%	W
Total	**2417**	**100%**	

https://www.mississauga.ca/wp-content/uploads/2022/04/06115838/W8_2935_Traffic_Impact_Study_March2022.pdf

Trip Distribution Comparables

Guelph, ON (2006)

hypothetical primary market area with a radius of approximately 5 kilometres (which translates into the entire City of Guelph) was established, and trips were assigned to routes based on population distributions. Non-home-based distributions were based on traffic patterns on the surrounding road



FUTURE SITE TRIP DISTRIBUTION

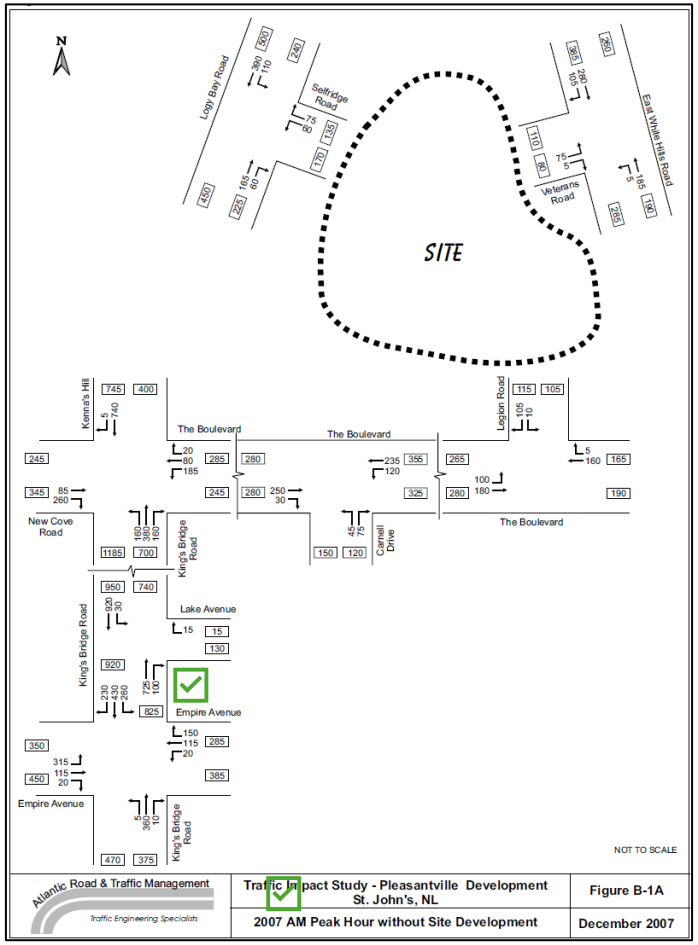
https://guelph.ca/wp-content/uploads/Lefarge_TrafficImpactStudy.pdf

Trip Distribution Comparables

St. Johns, NL (2008)

Distribution of Site Generated Trips

The City of St. John's QRS II Transportation Planning Model and local knowledge of the Study Area were used to determine the following distribution for site generated trips:



https://www.stjohns.ca/en/streets-parking/resources/Documents/Traffic-Studies/TrafficImpactStudyPleasantvilleRedevelopment_1.pdf

Trip Distribution Comparables

Penetanguishene, ON (2023)

The distribution of the new trips generated by the site has been developed based on distribution data provided in the 2016 Transportation Tomorrow Survey (TTS). The TTS is a comprehensive travel survey conducted in the Greater Golden Horseshoe Area once every five years. As per the

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	07:00:00	From:	08:00:00
To:	10:00:00	To:	09:00:00

Intersection: Church St & O'Reilley St
Site Code: 2308200001
Count Date: Apr 13, 2023

Weather conditions: Clear

** Unsignalized Intersection ** **Major Road:** Church St runs N/S

North Approach

	Out	In	Total
	13	11	24
	1	1	2
	0	0	0
	14	12	26

Church St

	0	0	0
	1	0	0
	12	1	0
Totals	13	1	0

Peds: 0

Peds: 0 | Peds: 1

Peds: 0

Totals	10	7	0
	9	4	0
	1	3	0
	0	0	0

Church St

East Approach

	Out	In	Total
	9	5	14
	1	3	4
	1	0	1
	11	8	19

O'Reilley St

Totals			
0	0	0	0
2	2	0	0
9	7	1	1

South Approach

	Out	In	Total
	13	19	32
	4	2	6
	0	1	1
	17	22	39

https://www.connectpenetanguishene.ca/42138/widgets/178216/documents/129261

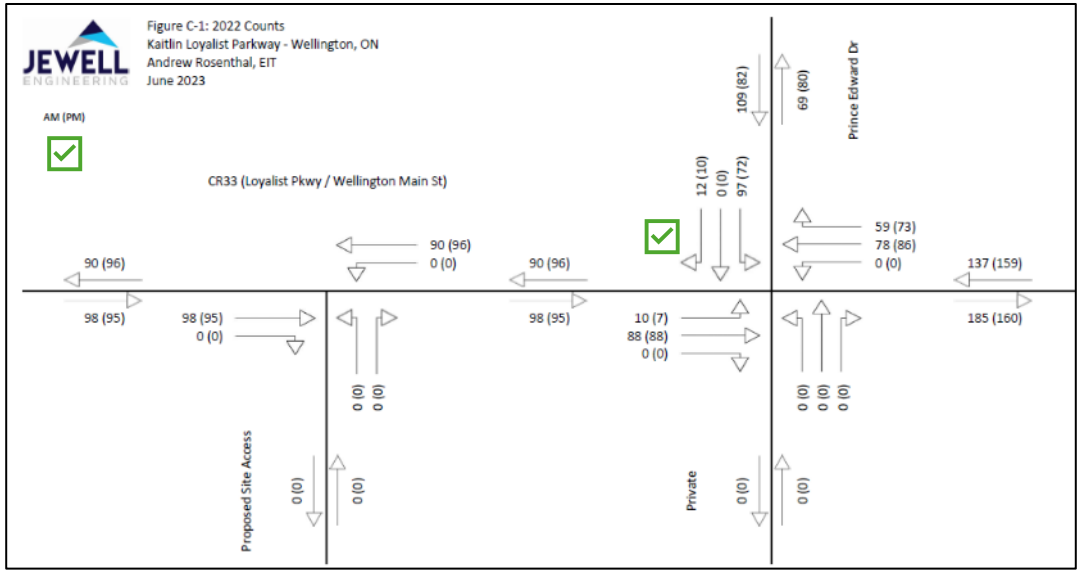
Trip Distribution Comparables

Wellington, ON (2023)

The new vehicle trips generated by the proposed residential development were assigned and distributed to the surrounding road network according to the existing travel patterns which reflect various "trip productions and attractions" in the study environs. The vehicular trip distribution assumes inbound/outbound trip distribution based on the following:

Table 4-3: AM/PM Trip Distribution

	AM Out	AM In	PM Out	PM In
To/From East	89%	86%	88%	91%
To/From West	11%	14%	12%	9%



https://www.thecounty.ca/wp-content/uploads/2024/06/Traffic-Impact-Study.pdf

Trip Distribution Comparables

Kitchener, ON (2024)

The trip distribution and assignment of traffic to Biehn Drive under Scenario 1 and Caryndale Drive under Scenario 2 are summarized in **Table 3**. The projected trip distribution is based on future travel patterns based on proposed improvements to the road network (i.e. Robert Ferrie

"Our professional opinion"

Erik Riek, Dec 6 2024

14	Trip distribution	○ ITE trip distribution IN/OUT split ○ Regional travel demand ○ Population and employment distribution ○ Market analysis of catchment area ○ Other…

Table 3: BTE Trip Distribution and Assignment (2024)

Scenario	Origin / Destination Neighbourhood	Distribution		Number of Vehicle Trips
Scenario 1 – Extension of Biehn Drive (Location – Current Biehn Drive Terminus)	Neighbourhood 2 (Marl Meadow Neighbourhood)	Trips to/from the south via Robert Ferrie Drive	5%	224
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			Total=	2,482

https://pub-kitchener.escribemeetings.com/filestream.ashx?DocumentId=22832

Review Process

"The independent consultant review [Associated Engineering] was of the over all EA process, not the transportation study specifically."

Chris Spere, Dec 5 2024

Associated Engineering did not reply:

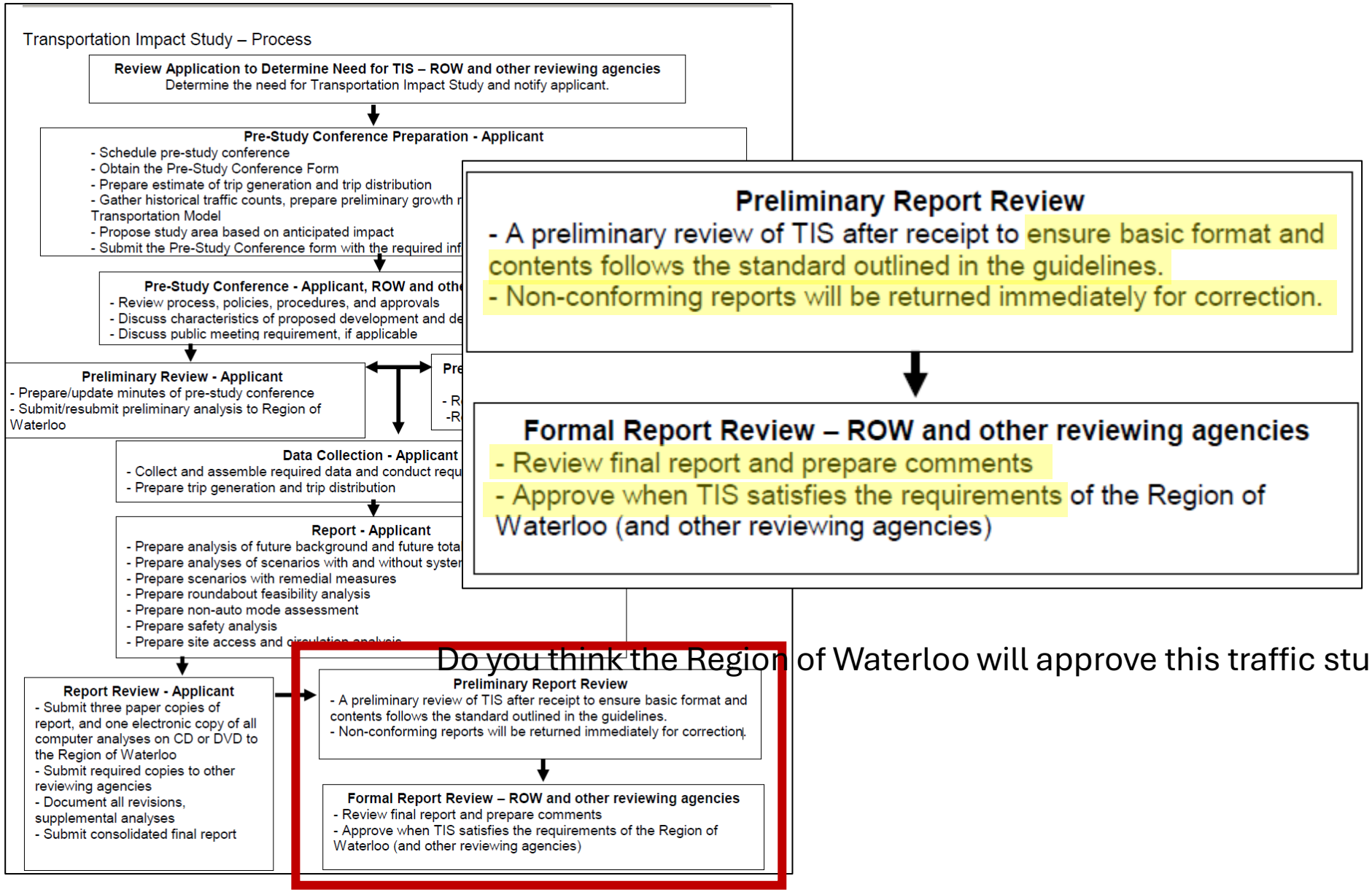
"Could you confirm that AE has reviewed the methodology and findings of this traffic study, and that AE stands behind its results and conclusions?"

Ray Angod, Dec 9 2024

"I'm following up on my request from Dec 9th. Could you confirm that AE has reviewed the methodology and findings of this traffic study, and that AE stands behind its results and conclusions?"

Ray Angod, Dec 11 2024

Review Process



Do you think the Region of Waterloo will approve this traffic study?

https://www.regionofwaterloo.ca/en/living-here/resources/Design-Standards/Transportation-Impact-Study-Guidelines.pdf

Rejection Implications

"If we reject the staff report, could this be appealed by anybody?"

Councillor Jason Deneault, Dec 2 2024

"I think the answer to your question is likely legal advice which I would recommend obtaining in-camera pursuant to Section 239(f) of the Municipal Act"

Katherine Hughes, Dec 2 2024

Acceptance Implications

- Liability for negligence?
- Breach of duty?
- Class action?
- Impact on insurance?
- Impact on funding?
- Impact on bond ratings?
- PPP challenges?
- Precedent for future cases?

Conclusion

In summary, this traffic study:

- Does not match empirical data
- Does not adhere to municipal guidelines
- Is not consistent with other municipal traffic studies
- May not have been reviewed before submitted to City Council
- Calls into question the validity of the entire ESR

Approving the ESR may involve risks that outweigh those associated with rejecting it.