MAY 24, 2024

PROJECT NO: 2571-6892

SENT VIA: EMAIL TO MSHIH@LINCOLN.CA

Town of Lincoln
4800 South Service Rd
Beamsville, ON L3J 1L3

Attention: **Melissa Shih**

RE: **TRANSPORTATION IMPACT STUDY ADDENDUM IMPROVEMENT WARRANTS**

Dear Melissa,

C.F. Crozier & Associates Inc. (Crozier) was retained by 4933 Vic Court Globizen LP ("Globizen") in support of a proposed mixed-use development located at 4933 Victoria Avenue North in the Town of Lincoln (Town). This letter was prepared in response to the pre-submission comments provided by Town Staff.

Per the meeting held between the Town, Crozier and Globizen on May 21, 2024, this letter was prepared to provide information regarding the timing and scope of the improvements required by the growth in the area and the additional traffic expected once this development is completed. It is to provide additional information regarding the Transportation Demand Management facilities on site as they relate to the larger network. Attached to this letter is the diagram showing the connections between the site and the proposed active transportation network in the surrounding area.

This letter is to serve as an addendum to the Transportation Impact Study (TIS) dated May 2024. Specific details regarding the development, growth rates in the area and the development's horizon years can be found in the TIS.

Per the meeting, two scenarios were examined to determine the timing and type of improvements required. These two scenarios include one where the traffic in the area is grown by the growth rates for traffic in the area and no other developments in area and another where the 4933 Victoria Avenue North development is added to the first scenario. These scenarios were tested in each of the horizon years as described in the TIS.

Tables 1 and 2 summarize the results for the warrants for intersection signalization and left turn lane for the intersections of Victoria Avenue North/North Service Road and South Service Road/QEW Niagara bound respectively. The traffic signal warrants were done per the Ontario Manual (OTM) Justifications 1-4 and 7. The left turn lane warrants were done per the Ministry of Transportation's (MTO's) supplement for the Transportation Association of Canada's (TAC's) Geometric Design Guide for Canadian Roads (GDGCR). While all horizon years were tested, the critical years, determined by whether any improvement is required, are included in these tables.

Table 1: Victoria Avenue North and North Service Road Warrant Results

Warrant	Year/Scenario		
	2036 with just Growth	2026 with Site Traffic	2036 with Site Traffic
Left Turn Lane	Not Warranted	Not Warranted	Warranted
Intersection Signalization	Warranted	Warranted	Warranted

Table 2: South Service Road and QEW Niagara bound Warrant Results

Warrant	Year/Scenario
	2036 with Site Traffic
Intersection Signalization	Not Warranted

As can be seen in **Table 1**, at Victoria Avenue North and North Service Road the signals are warranted by 2036 without the development being included however this warrant moves up to the year 2026 once the development's expected trips are added. Also in 2036, with the traffic growth and the site traffic expected, an exclusive left turn lane is required with a storage length of 15 metres per the charts in the MTO's supplement. **Figure 1** estimates the requirements to the intersection to include this left turn lane.

As seen in **Table 2,** the intersection of South Service Road and QEW Niagara bound does not trigger the signalization in the ultimate scenario. Left turn lanes are existing at this intersection. The detailed results of the warrants are attached to this letter.

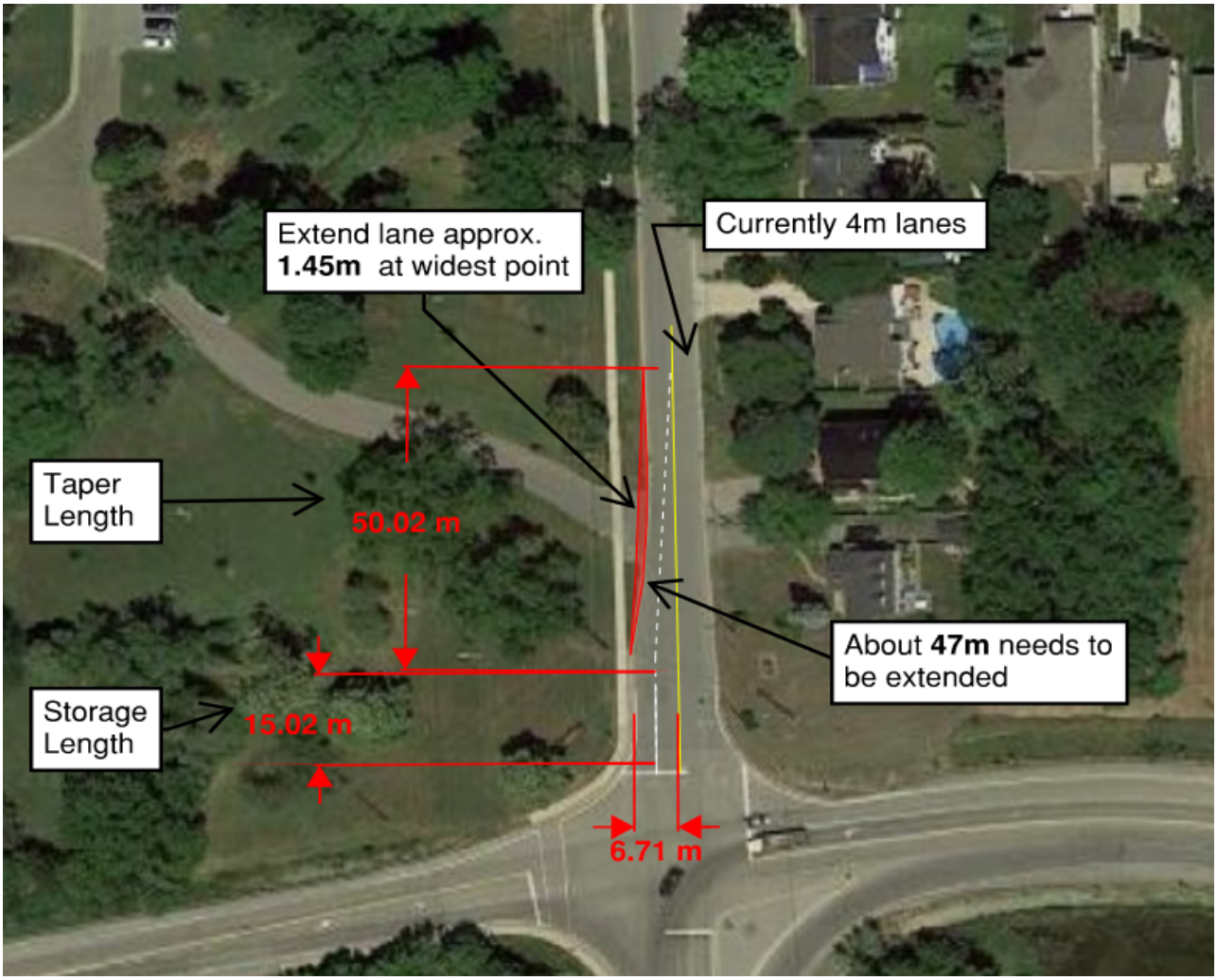


Figure 1 – Intersection Improvements at Victoria Avenue North and North Service Road

We trust that the contents herein address the comments received to date in relation to the proposed development located at 4933 Victoria Avenue North in the Town of Lincoln.

Should you have any questions or require any further information, please do not hesitate to contact the undersigned.

Sincerely,

C.F. CROZIER & ASSOCIATES INC.

Ian Lindley

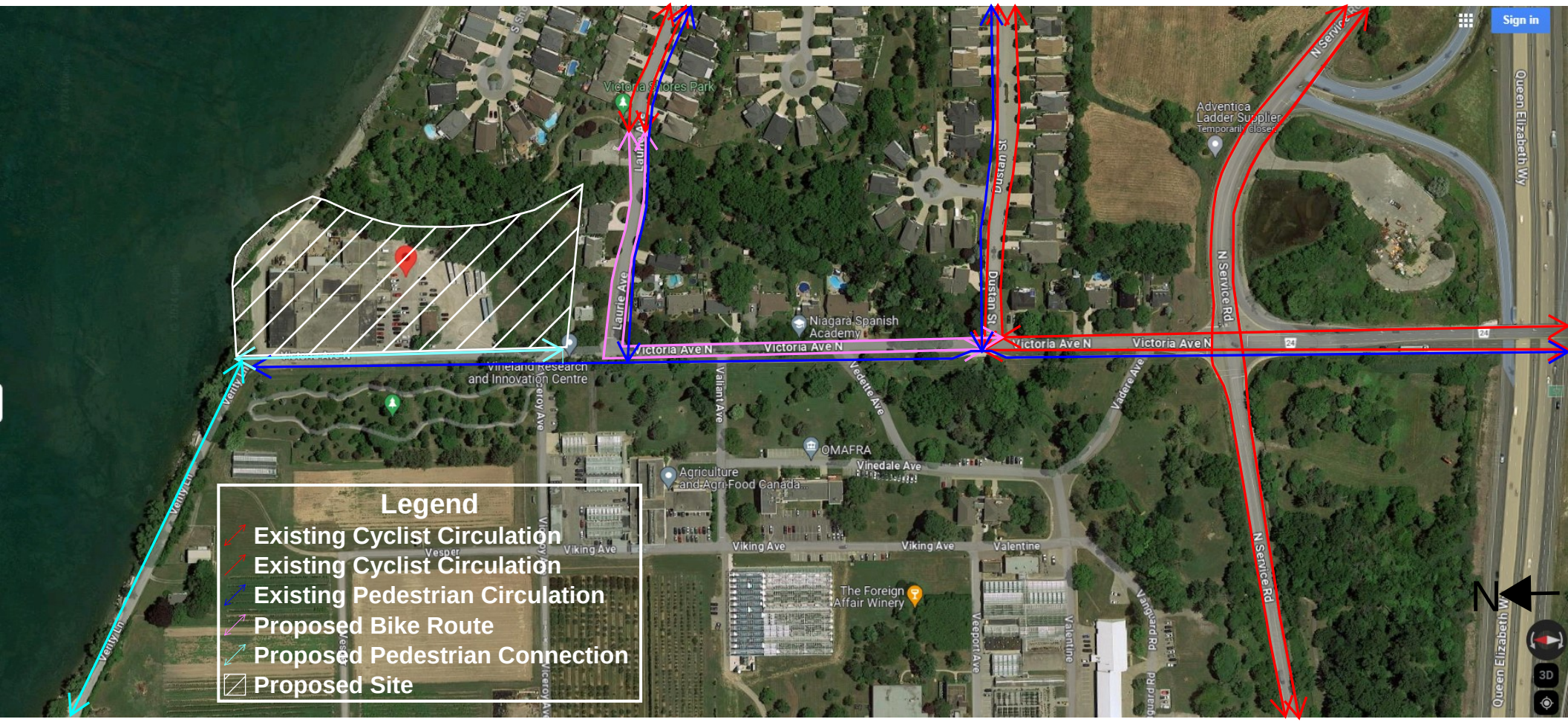
Ian Lindley, P.Eng. MASc.
Project Engineer, Transportation

IL;dd

J:\2500\2571 - 4933 Vic Court Globizen LP\6892 - 4933 Victoria Avenue N (Vineland)\Letters\2024.05.24_(2571-6892)_Addendum.docx

Attachment A

Active Transportation Connections


Legend
Existing Cyclist Circulation
Existing Cyclist Circulation
Existing Pedestrian Circulation
Proposed Bike Route
Proposed Pedestrian Connection
Proposed Site
Victoria Shores Park
Laurie Ave
Dustan St
Niagara Spanish Academy
Victoria Ave N
Vineland Research and Innovation Centre
Adventica Ladder Supplier
Temporarily closed
N Service Rd
Queen Elizabeth Wy
Valiant Ave
Vedette Ave
Vadere Ave
OMAFRA
Vinedale Ave
Agriculture and Agri-Food Canada...
Viking Ave
Valentine
The Foreign Affair Winery
Veeport Ave
Vanguard Rd
Verity Ln
Vesper
Sign in
N
3D

Attachment B

Warrant Results

Input Data Sheet

Analysis Sheet | Results Sheet | Proposed Collision

GO TO Justification:

What are the intersecting roadways? Victoria Avenue N and North Service Road

What is the direction of the Main Road street? North-South

When was the data collected? 2031 Grown

Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road? 1

b.- Number of lanes on the Minor Road? 1

c.- How many approaches? 4

d.- What is the operating environment? Urban **Population >= 10,000 AND Speed < 70 km/hr**

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

Hour Ending	Main Northbound Approach			Minor Eastbound Approach			Main Southbound Approach			Minor Westbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:00	14	15	156	3	24	58	9	18	3	200	58	20	0
8:00	14	15	156	3	24	58	9	18	3	200	58	20	0
9:00	14	15	156	3	24	58	9	18	3	200	58	20	0
12:00	14	15	156	3	24	58	9	18	3	200	58	20	0
13:00	14	15	156	3	24	58	9	18	3	200	58	20	0
16:00	14	15	156	3	24	58	9	18	3	200	58	20	0
17:00	14	15	156	3	24	58	9	18	3	200	58	20	0
18:00	14	15	156	3	24	58	9	18	3	200	58	20	0
Total	**108**	**120**	**1,250**	**20**	**194**	**460**	**68**	**140**	**22**	**1,596**	**460**	**158**	**0**

Justification 5: Collision Experience

Preceding Months	Number of Collisions*
1-12	0
13-24	0
25-36	0

* Include only collisions that are susceptable to correction through the installation of traffic signal control

Justification 6: Pedestrian Volume

a.- Please fill in table below summarizing total pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	10,000	5	10	5	0	0	0	0	
Factored 8 hour pedestrian volume	20,005		25		0		0		
% Assigned to crossing rate	23%		34%		30%		100%		
Net 8 Hour Pedestrian Volume at Crossing									4,610
Net 8 Hour Vehicular Volume on Street Being Crossed									2,000

b.- Please fill in table below summarizing delay to pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	10,000	5	10	5	0	0	0	0	
Total 8 hour pedestrians delayed greater than 10 seconds	10	10	1	6	2	4	0	0	
Factored volume of total pedestrians	20,005		25		0		0		
Factored volume of delayed pedestrians	30		8		8		0		
% Assigned to Crossing Rate	23%		34%		30%		100%		
Net 8 Hour Volume of Total Pedestrians									4,610
Net 8 Hour Volume of Delayed Pedestrians									12

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

Intersection: Victoria Avenue N and North Service Road Count Date: 2031 Grown

Summary Results

Justification			Compliance	Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	80 %	☐	☑
	B	Crossing Volume	100 %		
2. Delay to Cross Traffic	A	Main Road	30 %	☐	☑
	B	Crossing Road	100 %		
3. Combination	A	Justificaton 1	80 %	☐	☑
	B	Justification 2	30 %		
4. 4-Hr Volume			68 %	☐	☑
5. Collision Experience			0 %	☐	☑
6. Pedestrians	A	Volume	Justification met	☐	☑
	B	Delay	Justification not met		

Major Road:	Victoria Avenue N	Condition:	Free Flow	Date:	22-May-24
Minor Road:	North Service Road	Major Rd. Lanes:	1	Project No.:	2571-6892
Horizon Year:	2031 Grown	Intersection Type:	Existing	Analyst:	AK

OTM Book 12 - Table 19 - Justification 7 - Projected Volumes (Traffic Signal Justification for Future Development - Traffic Impact Studies)

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT 1 LANE HIGHWAYS		MINIMUM REQUIREMENT 2 OR MORE LANE		COMPLIANCE		
						Sectional		Entire Percentage
		Free Flow	Restricted Flow	Free Flow	Restricted Flow	Numerical	Percentage	
1. Minimum Vehicular Volume	A. Vehicle Volume, All Approaches (Avg. Hour)	576	864	720	1080	574.5	100%	100%
	B. Vehicle Volume, Along Minor Streets (Avg. Hour)	144	204	144	204	361	251%	
2. Delay to Cross Traffic	A. Vehicle Volume, Major Street (Avg. Hour)	576	864	720	1080	213.5	37%	37%
	B. Combined Vehicle and Pedestrian Volume Crossing Artery From Minor Streets (Avg. Hour)	60	90	144	204	260	433%	

Note:
Existing Intersection Requires 120 % Justification
Proposed Intersection Requires 150 % Justication

Signal Justification 7 Met: [ ] **Yes** [X] **No**

Inputs: Condition is "Free Flow" or "Restricted Flow"
Major Lanes is number of through lanes per direction (1,2,3)
Intersection Type is "Existing" or "Proposed"
Change Numerical Column in Table only

Input Data Sheet

Analysis Sheet | Results Sheet | Proposed Collision

GO TO Justification:

What are the intersecting roadways? Victoria Avenue N and North Service Road

What is the direction of the Main Road street? North-South

When was the data collected? 2036 Grown + Site

Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road? 1

b.- Number of lanes on the Minor Road? 1

c.- How many approaches? 4

d.- What is the operating environment? Urban **Population >= 10,000 AND Speed < 70 km/hr**

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

Hour Ending	Main Northbound Approach			Minor Eastbound Approach			Main Southbound Approach			Minor Westbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:00	15	62	173	3	27	64	52	56	3	220	63	67	0
8:00	15	62	173	3	27	64	52	56	3	220	63	67	0
9:00	15	62	173	3	27	64	52	56	3	220	63	67	0
12:00	15	62	173	3	27	64	52	56	3	220	63	67	0
13:00	15	62	173	3	27	64	52	56	3	220	63	67	0
16:00	15	62	173	3	27	64	52	56	3	220	63	67	0
17:00	15	62	173	3	27	64	52	56	3	220	63	67	0
18:00	15	62	173	3	27	64	52	56	3	220	63	67	0
Total	**120**	**493**	**1,380**	**22**	**214**	**510**	**420**	**445**	**26**	**1,760**	**506**	**539**	**0**

Justification 5: Collision Experience

Preceding Months	Number of Collisions*
1-12	0
13-24	0
25-36	0

* Include only collisions that are susceptable to correction through the installation of traffic signal control

Justification 6: Pedestrian Volume

a.- Please fill in table below summarizing total pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	10,000	5	10	5	0	0	0	0	
Factored 8 hour pedestrian volume	20,005		25		0		0		
% Assigned to crossing rate	23%		34%		30%		100%		
Net 8 Hour Pedestrian Volume at Crossing									4,610
Net 8 Hour Vehicular Volume on Street Being Crossed									2,000

b.- Please fill in table below summarizing delay to pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	10,000	5	10	5	0	0	0	0	
Total 8 hour pedestrians delayed greater than 10 seconds	10	10	1	6	2	4	0	0	
Factored volume of total pedestrians	20,005		25		0		0		
Factored volume of delayed pedestrians	30		8		8		0		
% Assigned to Crossing Rate	23%		34%		30%		100%		
Net 8 Hour Volume of Total Pedestrians									4,610
Net 8 Hour Volume of Delayed Pedestrians									12

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

Intersection: Victoria Avenue N and North Service Road Count Date: 2036 Grown + Site

Summary Results

Justification			Compliance	Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	100 %	☑	☐
	B	Crossing Volume	100 %		
2. Delay to Cross Traffic	A	Main Road	50 %	☐	☑
	B	Crossing Road	100 %		
3. Combination	A	Justificaton 1	100 %	☐	☑
	B	Justification 2	50 %		
4. 4-Hr Volume			100 %	☑	☐
5. Collision Experience			0 %	☐	☑
6. Pedestrians	A	Volume	Justification met	☐	☑
	B	Delay	Justification not met		

Major Road:	Victoria Avenue N	Condition:	Free Flow	Date:	22-May-24
Minor Road:	North Service Road	Major Rd. Lanes:	1	Project No.:	2571-6892
Horizon Year:	2036 Grown + Site	Intersection Type:	Existing	Analyst:	AK

OTM Book 12 - Table 19 - Justification 7 - Projected Volumes (Traffic Signal Justification for Future Development - Traffic Impact Studies)

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT 1 LANE HIGHWAYS		MINIMUM REQUIREMENT 2 OR MORE LANE		COMPLIANCE		
						Sectional		Entire Percentage
		Free Flow	Restricted Flow	Free Flow	Restricted Flow	Numerical	Percentage	
1. Minimum Vehicular Volume	A. Vehicle Volume, All Approaches (Avg. Hour)	576	864	720	1080	804.37	140%	140%
	B. Vehicle Volume, Along Minor Streets (Avg. Hour)	144	204	144	204	443.86	308%	
2. Delay to Cross Traffic	A. Vehicle Volume, Major Street (Avg. Hour)	576	864	720	1080	360.51	63%	63%
	B. Combined Vehicle and Pedestrian Volume Crossing Artery From Minor Streets (Avg. Hour)	60	90	144	204	286	477%	

Note:
Existing Intersection Requires 120 % Justification
Proposed Intersection Requires 150 % Justication

Signal Justification 7 Met: [X] **Yes** [ ] **No**

Inputs: Condition is "Free Flow" or "Restricted Flow"
Major Lanes is number of through lanes per direction (1,2,3)
Intersection Type is "Existing" or "Proposed"
Change Numerical Column in Table only

Input Data Sheet

Analysis Sheet | Results Sheet | Proposed Collision

GO TO Justification:

What are the intersecting roadways? Victoria Avenue N and North Service Road

What is the direction of the Main Road street? North-South

When was the data collected? 2036 Grown

Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road? 1

b.- Number of lanes on the Minor Road? 1

c.- How many approaches? 4

d.- What is the operating environment? Urban **Population >= 10,000 AND Speed < 70 km/hr**

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

Hour Ending	Main Northbound Approach			Minor Eastbound Approach			Main Southbound Approach			Minor Westbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:00	15	17	173	3	27	64	9	19	3	220	63	22	0
8:00	15	17	173	3	27	64	9	19	3	220	63	22	0
9:00	15	17	173	3	27	64	9	19	3	220	63	22	0
12:00	15	17	173	3	27	64	9	19	3	220	63	22	0
13:00	15	17	173	3	27	64	9	19	3	220	63	22	0
16:00	15	17	173	3	27	64	9	19	3	220	63	22	0
17:00	15	17	173	3	27	64	9	19	3	220	63	22	0
18:00	15	17	173	3	27	64	9	19	3	220	63	22	0
Total	**120**	**132**	**1,380**	**22**	**214**	**510**	**74**	**154**	**26**	**1,760**	**506**	**174**	**0**

Justification 5: Collision Experience

Preceding Months	Number of Collisions*
1-12	0
13-24	0
25-36	0

* Include only collisions that are susceptable to correction through the installation of traffic signal control

Justification 6: Pedestrian Volume

a.- Please fill in table below summarizing total pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	10,000	5	10	5	0	0	0	0	
Factored 8 hour pedestrian volume	20,005		25		0		0		
% Assigned to crossing rate	23%		34%		30%		100%		
Net 8 Hour Pedestrian Volume at Crossing									4,610
Net 8 Hour Vehicular Volume on Street Being Crossed									2,000

b.- Please fill in table below summarizing delay to pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	10,000	5	10	5	0	0	0	0	
Total 8 hour pedestrians delayed greater than 10 seconds	10	10	1	6	2	4	0	0	
Factored volume of total pedestrians	20,005		25		0		0		
Factored volume of delayed pedestrians	30		8		8		0		
% Assigned to Crossing Rate	23%		34%		30%		100%		
Net 8 Hour Volume of Total Pedestrians									4,610
Net 8 Hour Volume of Delayed Pedestrians									12

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

Intersection: Victoria Avenue N and North Service Road Count Date: 2036 Grown

Summary Results

Justification			Compliance		Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	88	%	☐	☑
	B	Crossing Volume	100	%		
2. Delay to Cross Traffic	A	Main Road	33	%	☐	☑
	B	Crossing Road	100	%		
3. Combination	A	Justificaton 1	88	%	☐	☑
	B	Justification 2	33	%		
4. 4-Hr Volume			77	%	☐	☑
5. Collision Experience			0	%	☐	☑
6. Pedestrians	A	Volume	Justification met		☐	☑
	B	Delay	Justification not met			

Major Road:	Victoria Avenue N	Condition:	Free Flow	Date:	22-May-24
Minor Road:	North Service Road	Major Rd. Lanes:	1	Project No.:	2571-6892
Horizon Year:	2036 Grown	Intersection Type:	Existing	Analyst:	AK

OTM Book 12 - Table 19 - Justification 7 - Projected Volumes (Traffic Signal Justification for Future Development - Traffic Impact Studies)

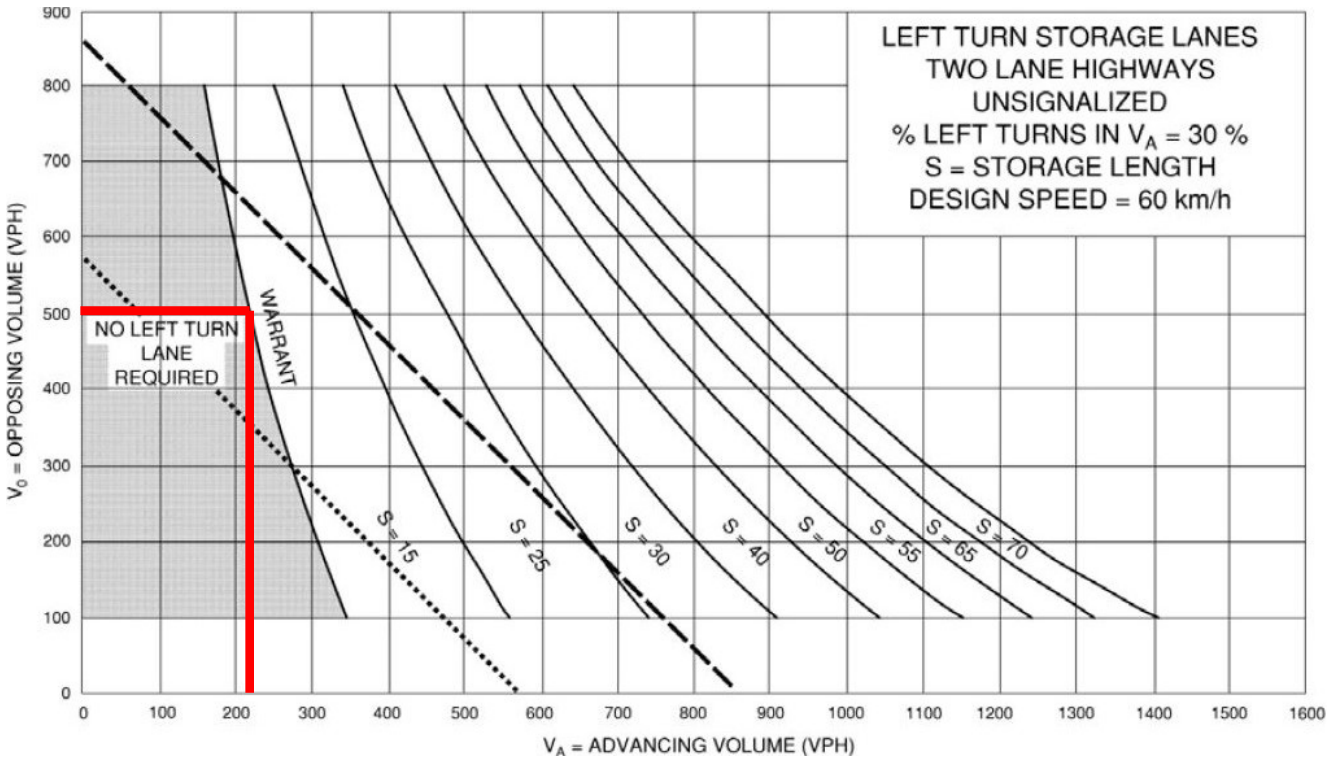
JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT 1 LANE HIGHWAYS		MINIMUM REQUIREMENT 2 OR MORE LANE		COMPLIANCE		
						Sectional		Entire Percentage
		Free Flow	Restricted Flow	Free Flow	Restricted Flow	Numerical	Percentage	
1. Minimum Vehicular Volume	A. Vehicle Volume, All Approaches (Avg. Hour)	576	864	720	1080	634	110%	110%
	B. Vehicle Volume, Along Minor Streets (Avg. Hour)	144	204	144	204	398.25	277%	
2. Delay to Cross Traffic	A. Vehicle Volume, Major Street (Avg. Hour)	576	864	720	1080	235.75	41%	41%
	B. Combined Vehicle and Pedestrian Volume Crossing Artery From Minor Streets (Avg. Hour)	60	90	144	204	286	477%	

Note:
Existing Intersection Requires 120 % Justification
Proposed Intersection Requires 150 % Justication

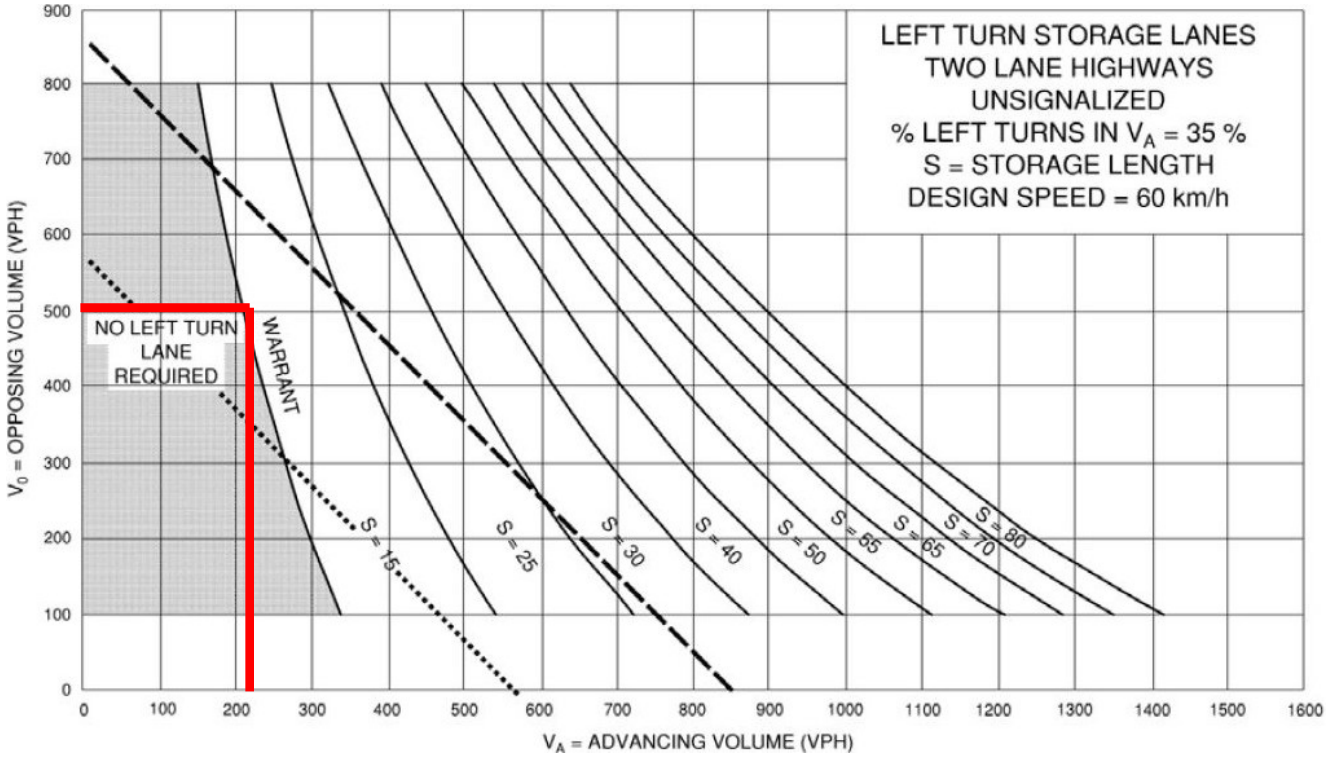
Signal Justification 7 Met: [X] **Yes** [ ] **No**

Inputs: Condition is "Free Flow" or "Restricted Flow"
Major Lanes is number of through lanes per direction (1,2,3)
Intersection Type is "Existing" or "Proposed"
Change Numerical Column in Table only

AM Peak Hour



AM Peak Hour

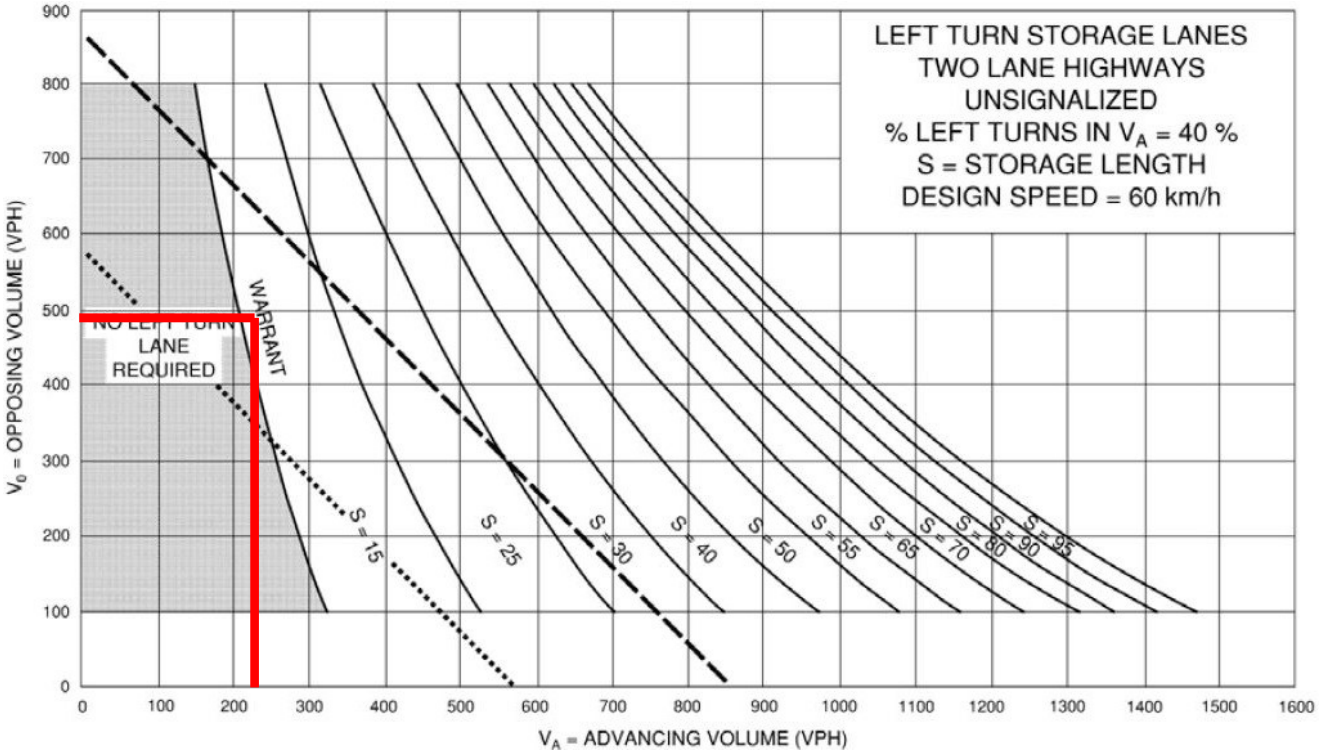


Left-Turn Lane Warrant

2036 Grown + Site Traffic

Victoria Avenue North and North Service Road

PM Peak Hour



Left-Turn Lane Warrant

2036 Grown + Site Traffic

Victoria Avenue North and North Service Road

Input Data Sheet

Analysis Sheet | Results Sheet | Proposed Collision

GO TO Justification:

What are the intersecting roadways? Victoria Avenue N and North Service Road

What is the direction of the Main Road street? North-South

When was the data collected? 2026 Grown + Site

Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road? 1

b.- Number of lanes on the Minor Road? 1

c.- How many approaches? 4

d.- What is the operating environment? Urban **Population >= 10,000 AND Speed < 70 km/hr**

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

Hour Ending	Main Northbound Approach			Minor Eastbound Approach			Main Southbound Approach			Minor Westbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:00	13	59	142	3	22	52	51	52	3	181	52	64	0
8:00	13	59	142	3	22	52	51	52	3	181	52	64	0
9:00	13	59	142	3	22	52	51	52	3	181	52	64	0
12:00	13	59	142	3	22	52	51	52	3	181	52	64	0
13:00	13	59	142	3	22	52	51	52	3	181	52	64	0
16:00	13	59	142	3	22	52	51	52	3	181	52	64	0
17:00	13	59	142	3	22	52	51	52	3	181	52	64	0
18:00	13	59	142	3	22	52	51	52	3	181	52	64	0
Total	**100**	**469**	**1,134**	**20**	**176**	**418**	**406**	**419**	**22**	**1,446**	**416**	**509**	**0**

Justification 5: Collision Experience

Preceding Months	Number of Collisions*
1-12	0
13-24	0
25-36	0

* Include only collisions that are susceptable to correction through the installation of traffic signal control

Justification 6: Pedestrian Volume

a.- Please fill in table below summarizing total pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	10,000	5	10	5	0	0	0	0	
Factored 8 hour pedestrian volume	20,005		25		0		0		
% Assigned to crossing rate	23%		34%		30%		100%		
Net 8 Hour Pedestrian Volume at Crossing									4,610
Net 8 Hour Vehicular Volume on Street Being Crossed									2,000

b.- Please fill in table below summarizing delay to pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	10,000	5	10	5	0	0	0	0	
Total 8 hour pedestrians delayed greater than 10 seconds	10	10	1	6	2	4	0	0	
Factored volume of total pedestrians	20,005		25		0		0		
Factored volume of delayed pedestrians	30		8		8		0		
% Assigned to Crossing Rate	23%		34%		30%		100%		
Net 8 Hour Volume of Total Pedestrians									4,610
Net 8 Hour Volume of Delayed Pedestrians									12

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

Intersection: Victoria Avenue N and North Service Road Count Date: 2026 Grown + Site

Summary Results

Justification			Compliance	Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	96 %	☐	☑
	B	Crossing Volume	100 %		
2. Delay to Cross Traffic	A	Main Road	44 %	☐	☑
	B	Crossing Road	100 %		
3. Combination	A	Justificaton 1	96 %	☐	☑
	B	Justification 2	44 %		
4. 4-Hr Volume			85 %	☐	☑
5. Collision Experience			0 %	☐	☑
6. Pedestrians	A	Volume	Justification met	☐	☑
	B	Delay	Justification not met		

Major Road:	Victoria Avenue N	Condition:	Free Flow	Date:	22-May-24
Minor Road:	North Service Road	Major Rd. Lanes:	1	Project No.:	2571-6892
Horizon Year:	2026 Grown + Site	Intersection Type:	Existing	Analyst:	AK

OTM Book 12 - Table 19 - Justification 7 - Projected Volumes (Traffic Signal Justification for Future Development - Traffic Impact Studies)

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT 1 LANE HIGHWAYS		MINIMUM REQUIREMENT 2 OR MORE LANE		COMPLIANCE		
						Sectional		Entire Percentage
		Free Flow	Restricted Flow	Free Flow	Restricted Flow	Numerical	Percentage	
1. Minimum Vehicular Volume	A. Vehicle Volume, All Approaches (Avg. Hour)	576	864	720	1080	691.87	120%	120%
	B. Vehicle Volume, Along Minor Streets (Avg. Hour)	144	204	144	204	373.12	259%	
2. Delay to Cross Traffic	A. Vehicle Volume, Major Street (Avg. Hour)	576	864	720	1080	318.76	55%	55%
	B. Combined Vehicle and Pedestrian Volume Crossing Artery From Minor Streets (Avg. Hour)	60	90	144	204	235	392%	

Note:
Existing Intersection Requires 120 % Justification
Proposed Intersection Requires 150 % Justication

Signal Justification 7 Met: [X] **Yes** [ ] **No**

Inputs: Condition is "Free Flow" or "Restricted Flow"
Major Lanes is number of through lanes per direction (1,2,3)
Intersection Type is "Existing" or "Proposed"
Change Numerical Column in Table only

Major Road:	South Service Road	Condition:	Free Flow	Date:	22-May-24
Minor Road:	QEW Niagara Bound Ramps	Major Rd. Lanes:	1	Project No.:	2571-6892
Horizon Year:	2036 Grown + Site SAT	Intersection Type:	Existing	Analyst:	AK

OTM Book 12 - Table 19 - Justification 7 - Projected Volumes (Traffic Signal Justification for Future Development - Traffic Impact Studies)

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT 1 LANE HIGHWAYS		MINIMUM REQUIREMENT 2 OR MORE LANE		COMPLIANCE		
						Sectional		Entire Percentage
		Free Flow	Restricted Flow	Free Flow	Restricted Flow	Numerical	Percentage	
1. Minimum Vehicular Volume	A. Vehicle Volume, All Approaches (Avg. Hour)	864	1296	1080	1620	636.45	74%	74%
	B. Vehicle Volume, Along Minor Streets (Avg. Hour)	216	306	216	306	311.95	144%	
2. Delay to Cross Traffic	A. Vehicle Volume, Major Street (Avg. Hour)	864	1296	1080	1620	324.5	38%	23%
	B. Combined Vehicle and Pedestrian Volume Crossing Artery From Minor Streets (Avg. Hour)	90	135	216	306	21	23%	

Note:
Existing Intersection Requires 120 % Justification
Proposed Intersection Requires 150 % Justication

Signal Justification 7 Met: [ ] **Yes** [X] **No**

Inputs: Condition is "Free Flow" or "Restricted Flow"
Major Lanes is number of through lanes per direction (1,2,3)
Intersection Type is "Existing" or "Proposed"
Change Numerical Column in Table only

Input Data Sheet

Analysis Sheet | Results Sheet | Proposed Collision

GO TO Justification:

What are the intersecting roadways? South Service Road and QEW Niagara Bound Ramps

What is the direction of the Main Road street? East-West

When was the data collected? 2036 Grown + Site (AM/PM)

Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road? 1

b.- Number of lanes on the Minor Road? 1

c.- How many approaches? 3

d.- What is the operating environment? Urban **Population >= 10,000 AND Speed < 70 km/hr**

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

Hour Ending	Main Eastbound Approach			Minor Northbound Approach			Main Westbound Approach			Minor Southbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:00	291	17	0	0	0	0	0	16	11	9	0	209	0
8:00	291	17	0	0	0	0	0	16	11	9	0	209	0
9:00	291	17	0	0	0	0	0	16	11	9	0	209	0
12:00	291	17	0	0	0	0	0	16	11	9	0	209	0
13:00	291	17	0	0	0	0	0	16	11	9	0	209	0
16:00	291	17	0	0	0	0	0	16	11	9	0	209	0
17:00	291	17	0	0	0	0	0	16	11	9	0	209	0
18:00	291	17	0	0	0	0	0	16	11	9	0	209	0
Total	**2,329**	**138**	**0**	**0**	**0**	**0**	**0**	**126**	**88**	**70**	**0**	**1,675**	**0**

Justification 5: Collision Experience

Preceding Months	Number of Collisions*
1-12	0
13-24	0
25-36	0

* Include only collisions that are susceptable to correction through the installation of traffic signal control

Justification 6: Pedestrian Volume

a.- Please fill in table below summarizing total pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	10,000	5	10	5	0	0	0	0	
Factored 8 hour pedestrian volume	20,005		25		0		0		
% Assigned to crossing rate	23%		34%		30%		100%		
Net 8 Hour Pedestrian Volume at Crossing									4,610
Net 8 Hour Vehicular Volume on Street Being Crossed									2,000

b.- Please fill in table below summarizing delay to pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	10,000	5	10	5	0	0	0	0	
Total 8 hour pedestrians delayed greater than 10 seconds	10	10	1	6	2	4	0	0	
Factored volume of total pedestrians	20,005		25		0		0		
Factored volume of delayed pedestrians	30		8		8		0		
% Assigned to Crossing Rate	23%		34%		30%		100%		
Net 8 Hour Volume of Total Pedestrians									4,610
Net 8 Hour Volume of Delayed Pedestrians									12

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

Intersection: South Service Road and QEW Niagara Bound Ramps Count Date: 2036 Grown + Site (AM/PM)

Summary Results

Justification			Compliance	Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	77 %	☐	☑
	B	Crossing Volume	86 %		
2. Delay to Cross Traffic	A	Main Road	47 %	☐	☑
	B	Crossing Road	12 %		
3. Combination	A	Justificaton 1	77 %	☐	☑
	B	Justification 2	12 %		
4. 4-Hr Volume			64 %	☐	☑
5. Collision Experience			0 %	☐	☑
6. Pedestrians	A	Volume	Justification met	☐	☑
	B	Delay	Justification not met		

Major Road:	South Service Road	Condition:	Free Flow	Date:	22-May-24
Minor Road:	QEW Niagara Bound Ramps	Major Rd. Lanes:	1	Project No.:	2571-6892
Horizon Year:	2036 Grown + Site (AM/PM)	Intersection Type:	Existing	Analyst:	AK

OTM Book 12 - Table 19 - Justification 7 - Projected Volumes (Traffic Signal Justification for Future Development - Traffic Impact Studies)

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT 1 LANE HIGHWAYS		MINIMUM REQUIREMENT 2 OR MORE LANE		COMPLIANCE		
						Sectional		Entire Percentage
		Free Flow	Restricted Flow	Free Flow	Restricted Flow	Numerical	Percentage	
1. Minimum Vehicular Volume	A. Vehicle Volume, All Approaches (Avg. Hour)	864	1296	1080	1620	553.35	64%	64%
	B. Vehicle Volume, Along Minor Streets (Avg. Hour)	216	306	216	306	218.17	101%	
2. Delay to Cross Traffic	A. Vehicle Volume, Major Street (Avg. Hour)	864	1296	1080	1620	335.19	39%	10%
	B. Combined Vehicle and Pedestrian Volume Crossing Artery From Minor Streets (Avg. Hour)	90	135	216	306	9	10%	

Note:
Existing Intersection Requires 120 % Justification
Proposed Intersection Requires 150 % Justication

Signal Justification 7 Met: [ ] **Yes** [X] **No**

Inputs: Condition is "Free Flow" or "Restricted Flow"
Major Lanes is number of through lanes per direction (1,2,3)
Intersection Type is "Existing" or "Proposed"
Change Numerical Column in Table only

Input Data Sheet

Analysis Sheet | Results Sheet | Proposed Collision

GO TO Justification:

What are the intersecting roadways? South Service Road and QEW Niagara Bound Ramps

What is the direction of the Main Road street? East-West

When was the data collected? 2036 Grown + Site SAT

Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road? 1

b.- Number of lanes on the Minor Road? 1

c.- How many approaches? 3

d.- What is the operating environment? Urban **Population >= 10,000 AND Speed < 70 km/hr**

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

Hour Ending	Main Eastbound Approach			Minor Northbound Approach			Main Westbound Approach			Minor Southbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:00	289	17	0	0	0	0	0	8	11	21	0	291	0
8:00	289	17	0	0	0	0	0	8	11	21	0	291	0
9:00	289	17	0	0	0	0	0	8	11	21	0	291	0
12:00	289	17	0	0	0	0	0	8	11	21	0	291	0
13:00	289	17	0	0	0	0	0	8	11	21	0	291	0
16:00	289	17	0	0	0	0	0	8	11	21	0	291	0
17:00	289	17	0	0	0	0	0	8	11	21	0	291	0
18:00	289	17	0	0	0	0	0	8	11	21	0	291	0
Total	**2,312**	**136**	**0**	**0**	**0**	**0**	**0**	**64**	**84**	**168**	**0**	**2,328**	**0**

Justification 5: Collision Experience

Preceding Months	Number of Collisions*
1-12	0
13-24	0
25-36	0

* Include only collisions that are susceptable to correction through the installation of traffic signal control

Justification 6: Pedestrian Volume

a.- Please fill in table below summarizing total pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	10,000	5	10	5	0	0	0	0	
Factored 8 hour pedestrian volume	20,005		25		0		0		
% Assigned to crossing rate	23%		34%		30%		100%		
Net 8 Hour Pedestrian Volume at Crossing									4,610
Net 8 Hour Vehicular Volume on Street Being Crossed									2,000

b.- Please fill in table below summarizing delay to pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	10,000	5	10	5	0	0	0	0	
Total 8 hour pedestrians delayed greater than 10 seconds	10	10	1	6	2	4	0	0	
Factored volume of total pedestrians	20,005		25		0		0		
Factored volume of delayed pedestrians	30		8		8		0		
% Assigned to Crossing Rate	23%		34%		30%		100%		
Net 8 Hour Volume of Total Pedestrians									4,610
Net 8 Hour Volume of Delayed Pedestrians									12

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

Intersection: South Service Road and QEW Niagara Bound Ramps Count Date: 2036 Grown + Site SAT

Summary Results

Justification			Compliance	Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	88 %	☐	☑
	B	Crossing Volume	100 %		
2. Delay to Cross Traffic	A	Main Road	45 %	☐	☑
	B	Crossing Road	28 %		
3. Combination	A	Justificaton 1	88 %	☐	☑
	B	Justification 2	28 %		
4. 4-Hr Volume			90 %	☐	☑
5. Collision Experience			0 %	☐	☑
6. Pedestrians	A	Volume	Justification met	☐	☑
	B	Delay	Justification not met		