

**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**

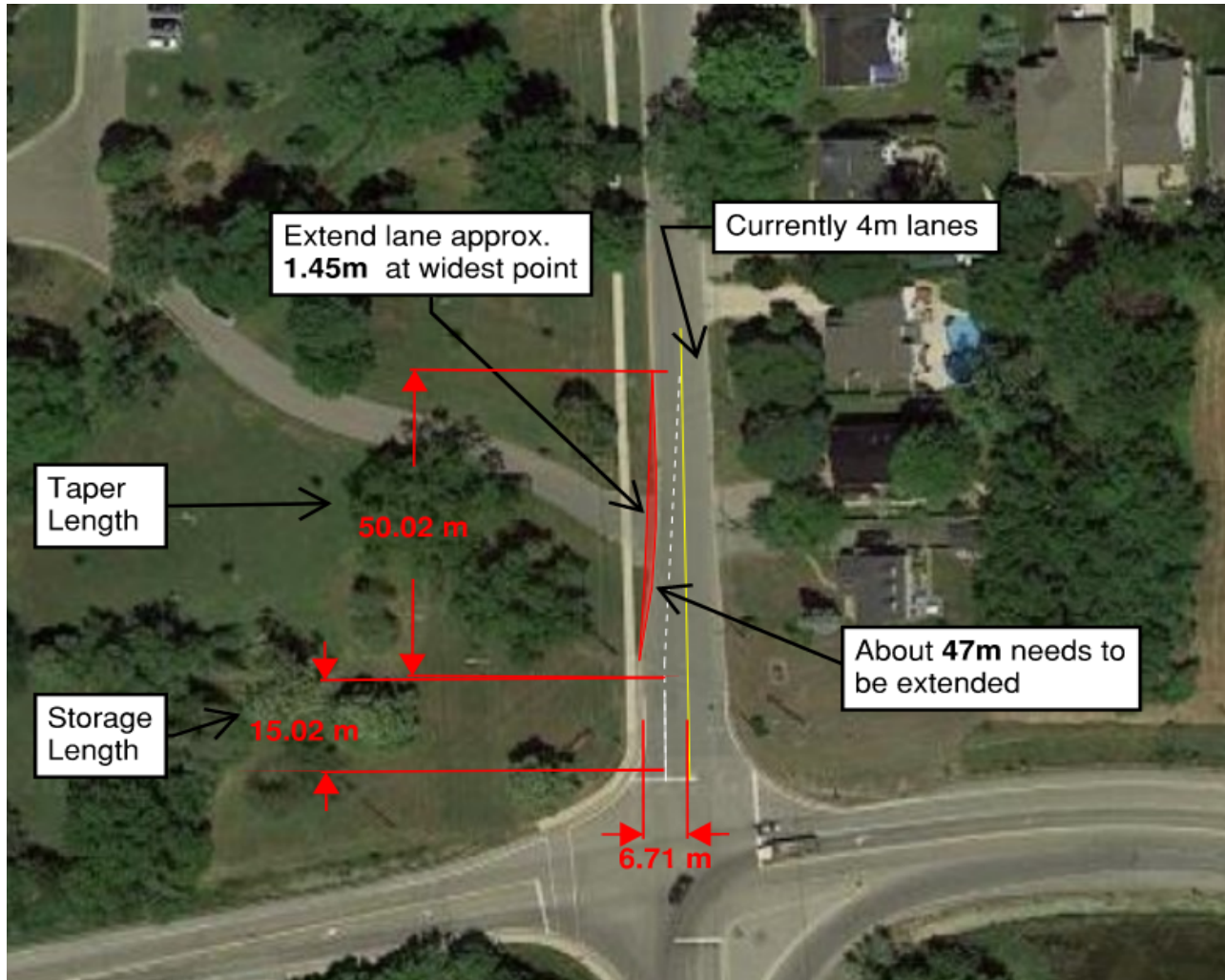
| Warrant                    | Year/Scenario         |                        |                        |
|----------------------------|-----------------------|------------------------|------------------------|
|                            | 2036 with just Growth | 2026 with Site Traffic | 2036 with Site 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, P.Eng. M.A.Sc.  
Project Engineer, Transportation

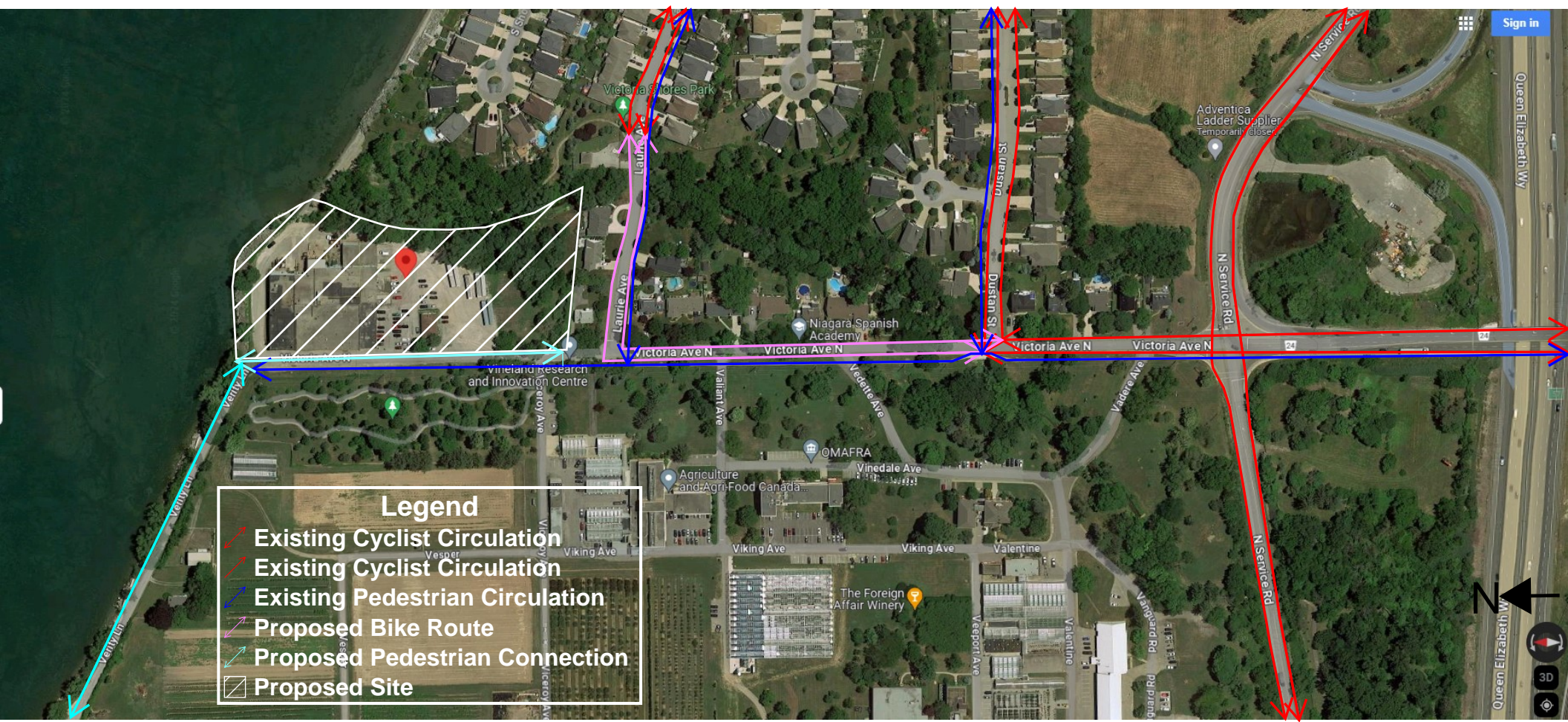
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J:\2500\2571 - 4933 Vic Court Globizen LP\6892 - 4933 Victoria Avenue N (Vineland)\Letters\2024.05.24\_(2571-6892)\_Addendum.docx







# Attachment A

## Active Transportation Connections





**Legend**

-  Existing Cyclist Circulation
-  Existing Cyclist Circulation
-  Existing Pedestrian Circulation
-  Proposed Bike Route
-  Proposed Pedestrian Connection
-  Proposed Site

Sign in

Queen Elizabeth WY

Adventica Ladder Supplier  
Temporarily closed

Victoria Stores Park

Niagara Spanish Academy

Vineland Research and Innovation Centre

Agriculture and Agri-Food Canada

MAFRA

The Foreign Affair Winery

N

3D

# Attachment B

## Warrant Results

# Input Data Sheet

Analysis Sheet

Results Sheet

Proposed Collision

What are the intersecting roadways?

Victoria Avenue N and North Service Road

GO TO Justification:

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                              |
| <b>Total</b> | <b>108</b>               | <b>120</b> | <b>1,250</b> | <b>20</b>                | <b>194</b> | <b>460</b> | <b>68</b>                | <b>140</b> | <b>22</b> | <b>1,596</b>             | <b>460</b> | <b>158</b> | <b>0</b>                       |

## Justification 5: Collision Experience

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

\* Include only collisions that are susceptible 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 |       |
| <b>Total 8 hour pedestrian volume</b>                      | 10,000   | 5          | 10       | 5          | 0                  | 0          | 0                  | 0          |       |
| <b>Factored 8 hour pedestrian volume</b>                   | 20,005   |            | 25       |            | 0                  |            | 0                  |            |       |
| <b>% Assigned to crossing rate</b>                         | 23%      |            | 34%      |            | 30%                |            | 100%               |            |       |
| <b>Net 8 Hour Pedestrian Volume at Crossing</b>            |          |            |          |            |                    |            |                    |            | 4,610 |
| <b>Net 8 Hour Vehicular Volume on Street Being Crossed</b> |          |            |          |            |                    |            |                    |            | 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 |       |
| <b>Total 8 hour pedestrian volume</b>                           | 10,000   | 5          | 10       | 5          | 0                  | 0          | 0                  | 0          |       |
| <b>Total 8 hour pedestrians delayed greater than 10 seconds</b> | 10       | 10         | 1        | 6          | 2                  | 4          | 0                  | 0          |       |
| <b>Factored volume of total pedestrians</b>                     | 20,005   |            | 25       |            | 0                  |            | 0                  |            |       |
| <b>Factored volume of delayed pedestrians</b>                   | 30       |            | 8        |            | 8                  |            | 0                  |            |       |
| <b>% Assigned to Crossing Rate</b>                              | 23%      |            | 34%      |            | 30%                |            | 100%               |            |       |
| <b>Net 8 Hour Volume of Total Pedestrians</b>                   |          |            |          |            |                    |            |                    |            | 4,610 |
| <b>Net 8 Hour Volume of Delayed Pedestrians</b>                 |          |            |          |            |                    |            |                    |            | 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                      | NO                                  |
| 1. Minimum Vehicular Volume | A Total Volume    | 80 %       |                          |                                     |
|                             | B Crossing Volume | 100 %      | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Delay to Cross Traffic   | A Main Road       | 30 %       |                          |                                     |
|                             | B Crossing Road   | 100 %      | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Combination              | A Justificaton 1  | 80 %       |                          |                                     |
|                             | B Justification 2 | 30 %       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. 4-Hr Volume              |                   | 68 %       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

|                         |     |                          |                                     |
|-------------------------|-----|--------------------------|-------------------------------------|
| 5. Collision Experience | 0 % | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|-------------------------|-----|--------------------------|-------------------------------------|

|                |          |                       |                          |                                     |
|----------------|----------|-----------------------|--------------------------|-------------------------------------|
| 6. Pedestrians | A Volume | Justification met     |                          |                                     |
|                | B Delay  | Justification not met | <input type="checkbox"/> | <input checked="" type="checkbox"/> |



Major Road: Victoria Avenue N  
 Minor Road: North Service Road  
 Horizon Year: 2031 Grown

Condition: Free Flow  
 Major Rd. Lanes: 1  
 Intersection Type: Existing

Date: 22-May-24  
 Project No.: 2571-6892  
 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 |            |                   |
|-----------------------------|--|-------------------------------------|-----------------|------------------------------------|-----------------|------------|------------|-------------------|
|                             |  | Free Flow                           | Restricted Flow | Free Flow                          | Restricted Flow | Sectional  |            | Entire Percentage |
|                             |  |                                     |                 |                                    |                 | 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 % Justification

Signal Justification 7 Met:  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

What are the intersecting roadways?

Victoria Avenue N and North Service Road

GO TO Justification:

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?

b.- Number of lanes on the Minor Road?

c.- How many approaches?

d.- What is the operating environment?  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                              |
| <b>Total</b> | <b>120</b>               | <b>493</b> | <b>1,380</b> | <b>22</b>                | <b>214</b> | <b>510</b> | <b>420</b>               | <b>445</b> | <b>26</b> | <b>1,760</b>             | <b>506</b> | <b>539</b> | <b>0</b>                       |

## Justification 5: Collision Experience

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

\* Include only collisions that are susceptible 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 |       |
| <b>Total 8 hour pedestrian volume</b>                      | 10,000   | 5          | 10       | 5          | 0                  | 0          | 0                  | 0          |       |
| <b>Factored 8 hour pedestrian volume</b>                   | 20,005   |            | 25       |            | 0                  |            | 0                  |            |       |
| <b>% Assigned to crossing rate</b>                         | 23%      |            | 34%      |            | 30%                |            | 100%               |            |       |
| <b>Net 8 Hour Pedestrian Volume at Crossing</b>            |          |            |          |            |                    |            |                    |            | 4,610 |
| <b>Net 8 Hour Vehicular Volume on Street Being Crossed</b> |          |            |          |            |                    |            |                    |            | 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 |       |
| <b>Total 8 hour pedestrian volume</b>                           | 10,000   | 5          | 10       | 5          | 0                  | 0          | 0                  | 0          |       |
| <b>Total 8 hour pedestrians delayed greater than 10 seconds</b> | 10       | 10         | 1        | 6          | 2                  | 4          | 0                  | 0          |       |
| <b>Factored volume of total pedestrians</b>                     | 20,005   |            | 25       |            | 0                  |            | 0                  |            |       |
| <b>Factored volume of delayed pedestrians</b>                   | 30       |            | 8        |            | 8                  |            | 0                  |            |       |
| <b>% Assigned to Crossing Rate</b>                              | 23%      |            | 34%      |            | 30%                |            | 100%               |            |       |
| <b>Net 8 Hour Volume of Total Pedestrians</b>                   |          |            |          |            |                    |            |                    |            | 4,610 |
| <b>Net 8 Hour Volume of Delayed Pedestrians</b>                 |          |            |          |            |                    |            |                    |            | 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                                 | NO                                  |
| 1. Minimum Vehicular Volume | A Total Volume    | 100 %      | <input type="checkbox"/>            | <input type="checkbox"/>            |
|                             | B Crossing Volume | 100 %      | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 2. Delay to Cross Traffic   | A Main Road       | 50 %       | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
|                             | B Crossing Road   | 100 %      | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 3. Combination              | A Justificaton 1  | 100 %      | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
|                             | B Justification 2 | 50 %       | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 4. 4-Hr Volume              |                   | 100 %      | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |

|                         |     |                          |                                     |
|-------------------------|-----|--------------------------|-------------------------------------|
| 5. Collision Experience | 0 % | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|-------------------------|-----|--------------------------|-------------------------------------|

|                |          |                       |                          |                                     |
|----------------|----------|-----------------------|--------------------------|-------------------------------------|
| 6. Pedestrians | A Volume | Justification met     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|                | B Delay  | Justification not met | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Major Road: Victoria Avenue N  
 Minor Road: North Service Road  
 Horizon Year: 2036 Grown + Site

Condition: Free Flow  
 Major Rd. Lanes: 1  
 Intersection Type: Existing

Date: 22-May-24  
 Project No.: 2571-6892  
 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 |            |                   |
|-----------------------------|--|-------------------------------------|-----------------|------------------------------------|-----------------|------------|------------|-------------------|
|                             |  | Free Flow                           | Restricted Flow | Free Flow                          | Restricted Flow | Sectional  |            | Entire Percentage |
|                             |  |                                     |                 |                                    |                 | 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 % Justification

Signal Justification 7 Met:  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

What are the intersecting roadways?

Victoria Avenue N and North Service Road

GO TO Justification:

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?

b.- Number of lanes on the Minor Road?

c.- How many approaches?

d.- What is the operating environment?  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                              |
| <b>Total</b> | <b>120</b>               | <b>132</b> | <b>1,380</b> | <b>22</b>                | <b>214</b> | <b>510</b> | <b>74</b>                | <b>154</b> | <b>26</b> | <b>1,760</b>             | <b>506</b> | <b>174</b> | <b>0</b>                       |

## Justification 5: Collision Experience

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

\* Include only collisions that are susceptible 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 |       |
| <b>Total 8 hour pedestrian volume</b>                      | 10,000   | 5          | 10       | 5          | 0                  | 0          | 0                  | 0          |       |
| <b>Factored 8 hour pedestrian volume</b>                   | 20,005   |            | 25       |            | 0                  |            | 0                  |            |       |
| <b>% Assigned to crossing rate</b>                         | 23%      |            | 34%      |            | 30%                |            | 100%               |            |       |
| <b>Net 8 Hour Pedestrian Volume at Crossing</b>            |          |            |          |            |                    |            |                    |            | 4,610 |
| <b>Net 8 Hour Vehicular Volume on Street Being Crossed</b> |          |            |          |            |                    |            |                    |            | 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 |       |
| <b>Total 8 hour pedestrian volume</b>                           | 10,000   | 5          | 10       | 5          | 0                  | 0          | 0                  | 0          |       |
| <b>Total 8 hour pedestrians delayed greater than 10 seconds</b> | 10       | 10         | 1        | 6          | 2                  | 4          | 0                  | 0          |       |
| <b>Factored volume of total pedestrians</b>                     | 20,005   |            | 25       |            | 0                  |            | 0                  |            |       |
| <b>Factored volume of delayed pedestrians</b>                   | 30       |            | 8        |            | 8                  |            | 0                  |            |       |
| <b>% Assigned to Crossing Rate</b>                              | 23%      |            | 34%      |            | 30%                |            | 100%               |            |       |
| <b>Net 8 Hour Volume of Total Pedestrians</b>                   |          |            |          |            |                    |            |                    |            | 4,610 |
| <b>Net 8 Hour Volume of Delayed Pedestrians</b>                 |          |            |          |            |                    |            |                    |            | 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                      | NO                                  |
| 1. Minimum Vehicular Volume | A Total Volume    | 88 %       |                          |                                     |
|                             | B Crossing Volume | 100 %      | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Delay to Cross Traffic   | A Main Road       | 33 %       |                          |                                     |
|                             | B Crossing Road   | 100 %      | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Combination              | A Justificaton 1  | 88 %       |                          |                                     |
|                             | B Justification 2 | 33 %       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. 4-Hr Volume              |                   | 77 %       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

|                         |     |                          |                                     |
|-------------------------|-----|--------------------------|-------------------------------------|
| 5. Collision Experience | 0 % | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|-------------------------|-----|--------------------------|-------------------------------------|

|                |          |                       |                          |                                     |
|----------------|----------|-----------------------|--------------------------|-------------------------------------|
| 6. Pedestrians | A Volume | Justification met     |                          |                                     |
|                | B Delay  | Justification not met | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Major Road: Victoria Avenue N  
 Minor Road: North Service Road  
 Horizon Year: 2036 Grown

Condition: Free Flow  
 Major Rd. Lanes: 1  
 Intersection Type: Existing

Date: 22-May-24  
 Project No.: 2571-6892  
 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 |            |                   |
|-----------------------------|--|-------------------------------------|-----------------|------------------------------------|-----------------|------------|------------|-------------------|
|                             |  | Free Flow                           | Restricted Flow | Free Flow                          | Restricted Flow | Sectional  |            | Entire Percentage |
|                             |  |                                     |                 |                                    |                 | 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:

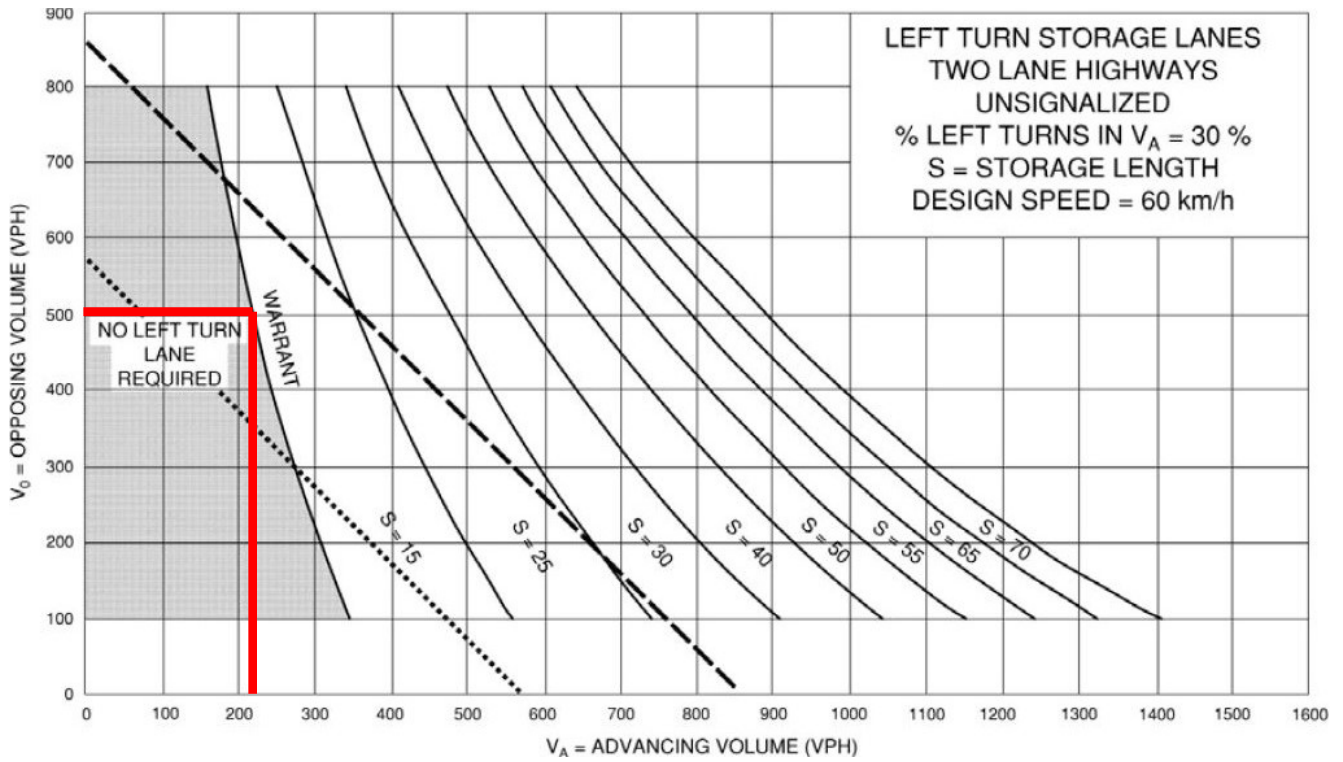
Existing Intersection Requires 120 % Justification  
 Proposed Intersection Requires 150 % Justification

Signal Justification 7 Met:  Yes  No

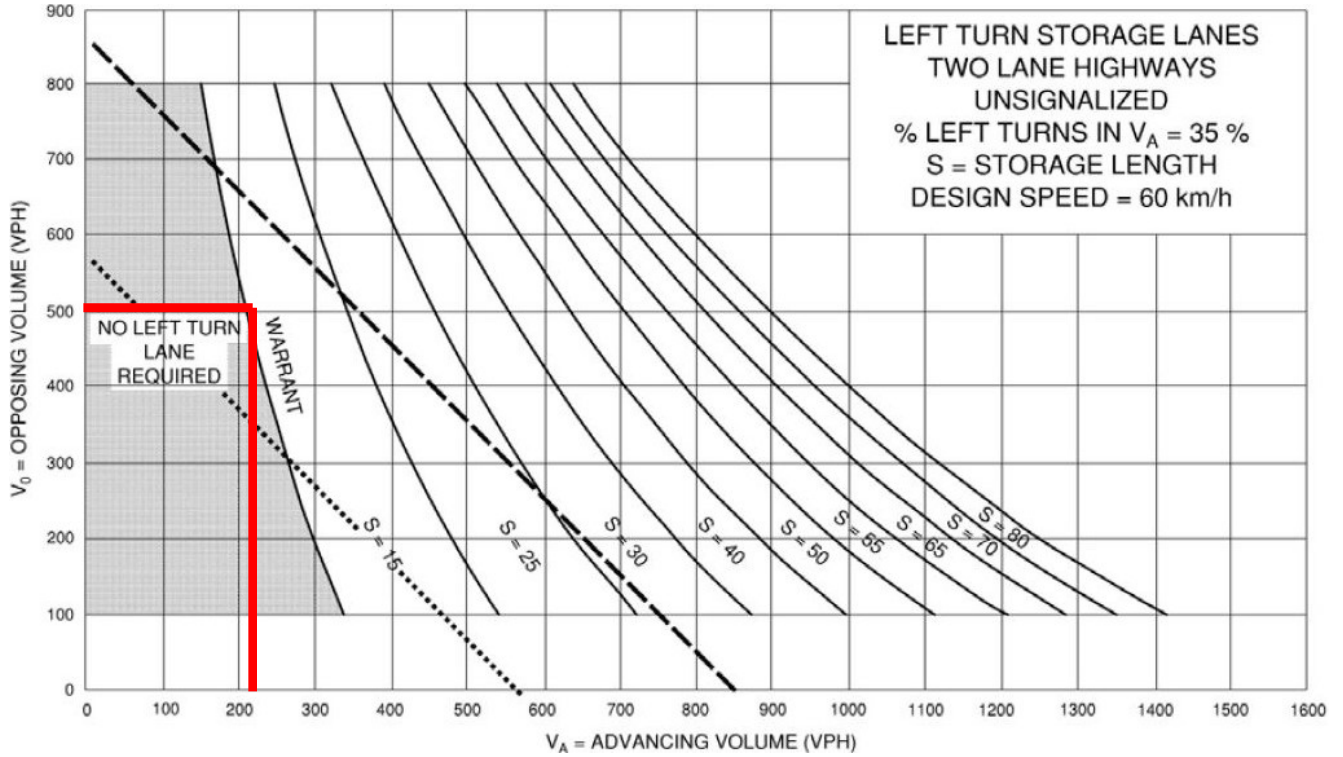
Inputs:

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

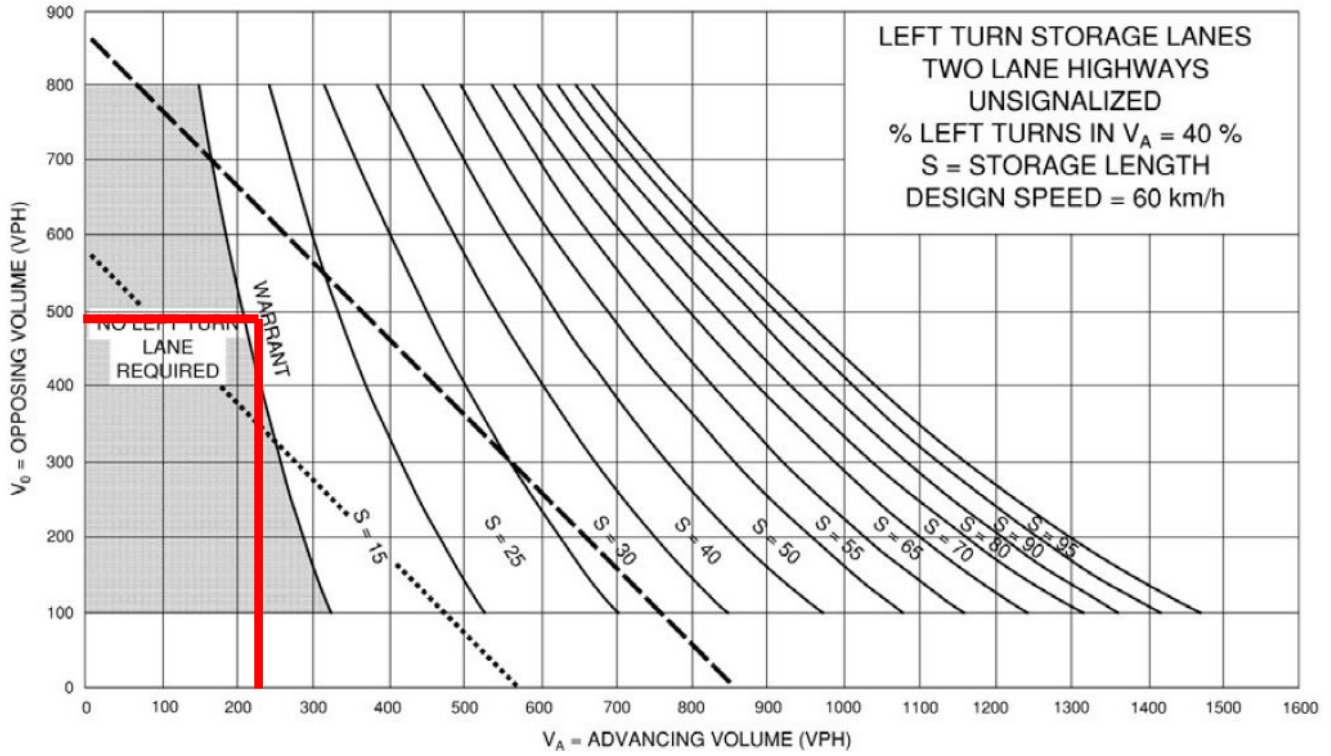


Left-Turn Lane Warrant

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                              |
| <b>Total</b> | <b>100</b>               | <b>469</b> | <b>1,134</b> | <b>20</b>                | <b>176</b> | <b>418</b> | <b>406</b>               | <b>419</b> | <b>22</b> | <b>1,446</b>             | <b>416</b> | <b>509</b> | <b>0</b>                       |

## Justification 5: Collision Experience

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

\* Include only collisions that are susceptible 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 |       |
| <b>Total 8 hour pedestrian volume</b>                      | 10,000   | 5          | 10       | 5          | 0                  | 0          | 0                  | 0          |       |
| <b>Factored 8 hour pedestrian volume</b>                   | 20,005   |            | 25       |            | 0                  |            | 0                  |            |       |
| <b>% Assigned to crossing rate</b>                         | 23%      |            | 34%      |            | 30%                |            | 100%               |            |       |
| <b>Net 8 Hour Pedestrian Volume at Crossing</b>            |          |            |          |            |                    |            |                    |            | 4,610 |
| <b>Net 8 Hour Vehicular Volume on Street Being Crossed</b> |          |            |          |            |                    |            |                    |            | 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 |       |
| <b>Total 8 hour pedestrian volume</b>                           | 10,000   | 5          | 10       | 5          | 0                  | 0          | 0                  | 0          |       |
| <b>Total 8 hour pedestrians delayed greater than 10 seconds</b> | 10       | 10         | 1        | 6          | 2                  | 4          | 0                  | 0          |       |
| <b>Factored volume of total pedestrians</b>                     | 20,005   |            | 25       |            | 0                  |            | 0                  |            |       |
| <b>Factored volume of delayed pedestrians</b>                   | 30       |            | 8        |            | 8                  |            | 0                  |            |       |
| <b>% Assigned to Crossing Rate</b>                              | 23%      |            | 34%      |            | 30%                |            | 100%               |            |       |
| <b>Net 8 Hour Volume of Total Pedestrians</b>                   |          |            |          |            |                    |            |                    |            | 4,610 |
| <b>Net 8 Hour Volume of Delayed Pedestrians</b>                 |          |            |          |            |                    |            |                    |            | 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                      | NO                                  |
| 1. Minimum Vehicular Volume | A Total Volume    | 96 %       |                          |                                     |
|                             | B Crossing Volume | 100 %      | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Delay to Cross Traffic   | A Main Road       | 44 %       |                          |                                     |
|                             | B Crossing Road   | 100 %      | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Combination              | A Justificaton 1  | 96 %       |                          |                                     |
|                             | B Justification 2 | 44 %       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. 4-Hr Volume              |                   | 85 %       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

|                         |     |                          |                                     |
|-------------------------|-----|--------------------------|-------------------------------------|
| 5. Collision Experience | 0 % | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|-------------------------|-----|--------------------------|-------------------------------------|

|                |          |                       |                          |                                     |
|----------------|----------|-----------------------|--------------------------|-------------------------------------|
| 6. Pedestrians | A Volume | Justification met     |                          |                                     |
|                | B Delay  | Justification not met | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Major Road: Victoria Avenue N  
 Minor Road: North Service Road  
 Horizon Year: 2026 Grown + Site

Condition: Free Flow  
 Major Rd. Lanes: 1  
 Intersection Type: Existing

Date: 22-May-24  
 Project No.: 2571-6892  
 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 |            |                   |
|-----------------------------|--|-------------------------------------|-----------------|------------------------------------|-----------------|------------|------------|-------------------|
|                             |  | Free Flow                           | Restricted Flow | Free Flow                          | Restricted Flow | Sectional  |            | Entire Percentage |
|                             |  |                                     |                 |                                    |                 | 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 % Justification

Signal Justification 7 Met:  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  
 Minor Road: QEW Niagara Bound Ramps  
 Horizon Year: 2036 Grown + Site SAT

Condition: Free Flow  
 Major Rd. Lanes: 1  
 Intersection Type: Existing

Date: 22-May-24  
 Project No.: 2571-6892  
 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 |            |                   |
|-----------------------------|--|-------------------------------------|-----------------|------------------------------------|-----------------|------------|------------|-------------------|
|                             |  | Free Flow                           | Restricted Flow | Free Flow                          | Restricted Flow | Sectional  |            | Entire Percentage |
|                             |  |                                     |                 |                                    |                 | 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 % Justification

Signal Justification 7 Met:  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](#)

What are the intersecting roadways?

South Service Road and QEW Niagara Bound Ramps

GO TO Justification:

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?

b.- Number of lanes on the Minor Road?

c.- How many approaches?

d.- What is the operating environment?  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                              |
| <b>Total</b> | <b>2,329</b>            | <b>138</b> | <b>0</b> | <b>0</b>                  | <b>0</b> | <b>0</b> | <b>0</b>                | <b>126</b> | <b>88</b> | <b>70</b>                 | <b>0</b> | <b>1,675</b> | <b>0</b>                       |

## Justification 5: Collision Experience

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

\* Include only collisions that are susceptible 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 |       |
| <b>Total 8 hour pedestrian volume</b>                      | 10,000   | 5          | 10       | 5          | 0                  | 0          | 0                  | 0          |       |
| <b>Factored 8 hour pedestrian volume</b>                   | 20,005   |            | 25       |            | 0                  |            | 0                  |            |       |
| <b>% Assigned to crossing rate</b>                         | 23%      |            | 34%      |            | 30%                |            | 100%               |            |       |
| <b>Net 8 Hour Pedestrian Volume at Crossing</b>            |          |            |          |            |                    |            |                    |            | 4,610 |
| <b>Net 8 Hour Vehicular Volume on Street Being Crossed</b> |          |            |          |            |                    |            |                    |            | 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 |       |
| <b>Total 8 hour pedestrian volume</b>                           | 10,000   | 5          | 10       | 5          | 0                  | 0          | 0                  | 0          |       |
| <b>Total 8 hour pedestrians delayed greater than 10 seconds</b> | 10       | 10         | 1        | 6          | 2                  | 4          | 0                  | 0          |       |
| <b>Factored volume of total pedestrians</b>                     | 20,005   |            | 25       |            | 0                  |            | 0                  |            |       |
| <b>Factored volume of delayed pedestrians</b>                   | 30       |            | 8        |            | 8                  |            | 0                  |            |       |
| <b>% Assigned to Crossing Rate</b>                              | 23%      |            | 34%      |            | 30%                |            | 100%               |            |       |
| <b>Net 8 Hour Volume of Total Pedestrians</b>                   |          |            |          |            |                    |            |                    |            | 4,610 |
| <b>Net 8 Hour Volume of Delayed Pedestrians</b>                 |          |            |          |            |                    |            |                    |            | 12    |

# Results Sheet

[Input Sheet](#)

[Analysis Sheet](#)

[Proposed Collision](#)

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

## Summary Results

|                             | Justification     | Compliance | Signal Justified?        |                                     |
|-----------------------------|-------------------|------------|--------------------------|-------------------------------------|
|                             |                   |            | YES                      | NO                                  |
| 1. Minimum Vehicular Volume | A Total Volume    | 77 %       |                          |                                     |
|                             | B Crossing Volume | 86 %       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Delay to Cross Traffic   | A Main Road       | 47 %       |                          |                                     |
|                             | B Crossing Road   | 12 %       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Combination              | A Justificaton 1  | 77 %       |                          |                                     |
|                             | B Justification 2 | 12 %       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. 4-Hr Volume              |                   | 64 %       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

|                         |     |                          |                                     |
|-------------------------|-----|--------------------------|-------------------------------------|
| 5. Collision Experience | 0 % | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|-------------------------|-----|--------------------------|-------------------------------------|

|                |          |                       |                          |                                     |
|----------------|----------|-----------------------|--------------------------|-------------------------------------|
| 6. Pedestrians | A Volume | Justification met     |                          |                                     |
|                | B Delay  | Justification not met | <input type="checkbox"/> | <input checked="" type="checkbox"/> |



Major Road: South Service Road  
 Minor Road: QEW Niagara Bound Ramps  
 Horizon Year: 2036 Grown + Site (AM/PM)

Condition: Free Flow  
 Major Rd. Lanes: 1  
 Intersection Type: Existing

Date: 22-May-24  
 Project No.: 2571-6892  
 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 |            |                   |
|-----------------------------|--|-------------------------------------|-----------------|------------------------------------|-----------------|------------|------------|-------------------|
|                             |  | Free Flow                           | Restricted Flow | Free Flow                          | Restricted Flow | Sectional  |            | Entire Percentage |
|                             |  |                                     |                 |                                    |                 | 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 % Justification

Signal Justification 7 Met:  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

What are the intersecting roadways?

South Service Road and QEW Niagara Bound Ramps

GO TO Justification:

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?

b.- Number of lanes on the Minor Road?

c.- How many approaches?

d.- What is the operating environment?  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                              |
| <b>Total</b> | <b>2,312</b>            | <b>136</b> | <b>0</b> | <b>0</b>                  | <b>0</b> | <b>0</b> | <b>0</b>                | <b>64</b> | <b>84</b> | <b>168</b>                | <b>0</b> | <b>2,328</b> | <b>0</b>                       |

## Justification 5: Collision Experience

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

\* Include only collisions that are susceptible 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 |       |
| <b>Total 8 hour pedestrian volume</b>                      | 10,000   | 5          | 10       | 5          | 0                  | 0          | 0                  | 0          |       |
| <b>Factored 8 hour pedestrian volume</b>                   | 20,005   |            | 25       |            | 0                  |            | 0                  |            |       |
| <b>% Assigned to crossing rate</b>                         | 23%      |            | 34%      |            | 30%                |            | 100%               |            |       |
| <b>Net 8 Hour Pedestrian Volume at Crossing</b>            |          |            |          |            |                    |            |                    |            | 4,610 |
| <b>Net 8 Hour Vehicular Volume on Street Being Crossed</b> |          |            |          |            |                    |            |                    |            | 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 |       |
| <b>Total 8 hour pedestrian volume</b>                           | 10,000   | 5          | 10       | 5          | 0                  | 0          | 0                  | 0          |       |
| <b>Total 8 hour pedestrians delayed greater than 10 seconds</b> | 10       | 10         | 1        | 6          | 2                  | 4          | 0                  | 0          |       |
| <b>Factored volume of total pedestrians</b>                     | 20,005   |            | 25       |            | 0                  |            | 0                  |            |       |
| <b>Factored volume of delayed pedestrians</b>                   | 30       |            | 8        |            | 8                  |            | 0                  |            |       |
| <b>% Assigned to Crossing Rate</b>                              | 23%      |            | 34%      |            | 30%                |            | 100%               |            |       |
| <b>Net 8 Hour Volume of Total Pedestrians</b>                   |          |            |          |            |                    |            |                    |            | 4,610 |
| <b>Net 8 Hour Volume of Delayed Pedestrians</b>                 |          |            |          |            |                    |            |                    |            | 12    |

# Results Sheet

[Input Sheet](#)

[Analysis Sheet](#)

[Proposed Collision](#)

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

## Summary Results

|                             | Justification     | Compliance | Signal Justified?        |                                     |
|-----------------------------|-------------------|------------|--------------------------|-------------------------------------|
|                             |                   |            | YES                      | NO                                  |
| 1. Minimum Vehicular Volume | A Total Volume    | 88 %       |                          | <input checked="" type="checkbox"/> |
|                             | B Crossing Volume | 100 %      | <input type="checkbox"/> |                                     |
| 2. Delay to Cross Traffic   | A Main Road       | 45 %       |                          | <input checked="" type="checkbox"/> |
|                             | B Crossing Road   | 28 %       | <input type="checkbox"/> |                                     |
| 3. Combination              | A Justificaton 1  | 88 %       |                          | <input checked="" type="checkbox"/> |
|                             | B Justification 2 | 28 %       | <input type="checkbox"/> |                                     |
| 4. 4-Hr Volume              |                   | 90 %       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

|                         |     |                          |                                     |
|-------------------------|-----|--------------------------|-------------------------------------|
| 5. Collision Experience | 0 % | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|-------------------------|-----|--------------------------|-------------------------------------|

|                |          |                       |                          |                                     |
|----------------|----------|-----------------------|--------------------------|-------------------------------------|
| 6. Pedestrians | A Volume | Justification met     |                          | <input checked="" type="checkbox"/> |
|                | B Delay  | Justification not met | <input type="checkbox"/> |                                     |