

## STUDY AND ANALYSIS INFORMATION

|                            |                     |   |                         |
|----------------------------|---------------------|---|-------------------------|
| Municipality:              | Stubenville         | Traffic Volumes Obtained By:                      | Smart Services          |
| County:                    | Jefferson           | Analysis Date:                                    | 11/6/2024               |
| ODOT Engineering District: | 11                  | Agency/ Company Name Performing Warrant Analysis: | Strand Associates, Inc. |
| Google map link:           | <a href="#">Map</a> |   |                         |

### Analysis Information

Data Collection Date: 9/10/2024  
 Day of the Week: Tuesday

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Existing Traffic Signal at intersection: Yes

Total Number of Approaches at Intersection: 4

### Major Street Information

Major Street Name and Route Number: 4th St

Major Street Approach Direction: N-Bound  
S-Bound

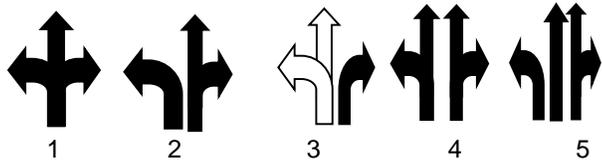
Number of Thru Lanes on Each Major Street Approach: 1 LANE(S)

Speed Limit or 85th Percentile Speed on the Major Street\*: 25 MPH  
\*Unknown assumes below 45 mph

### Minor Street Information

Minor Street Name and Route Number: Adams St

Minor Street Approach Configuration: 2 E-Bound  
2 W-Bound



Number of Thru Lanes on Each Minor Street Approach: 1 LANE(S)

Apply Right Turn Lane Reduction\*: Yes

\*Right Turn Lane Reduction Shall be used for Warrants 1, 2, & 3 for New ODOT Signals. Please refer to TEM 402-3.2 for clarification and criteria under which Right Turn Reduction is not required.

## TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

|  | Warrant     |            | Notes and Comments:  |                  |          |         |
|--|-------------|------------|--|------------------|----------|---------|
|  | Applicable? | Satisfied? |  |                  |          |         |
| <b>Warrant 1, Eight-Hour Vehicular Volume</b>  | Yes         | No         |  |                  |          |         |
| <b>Warrant 2, Four-Hour Vehicular Volume</b>   | Yes         | No         |  |                  |          |         |
| <b>Warrant 3, Peak Hour</b>  | Yes         | No         | Signals installed under Warrant 3 should be traffic actuated. <table border="1" style="float: right; margin-top: 5px;"> <tr><td style="text-align: center;"><b>Peak Hour</b></td></tr> <tr><td style="text-align: center;">12:00 PM</td></tr> <tr><td style="text-align: center;">1:00 PM</td></tr> </table>   | <b>Peak Hour</b> | 12:00 PM | 1:00 PM |
| <b>Peak Hour</b>   |             |            |  |                  |          |         |
| 12:00 PM   |             |            |  |                  |          |         |
| 1:00 PM  |             |            |  |                  |          |         |
| For Warrants 1-3, new ODOT signals must be based off of 100% volume thresholds (TEM 402-3.2) |             |            |  |                  |          |         |
| <b>Warrant 4, Pedestrian Volume</b>  | Yes         | No         | If this warrant is met, and a traffic control signal is justified by an engineering study, the traffic control signal shall be equipped with pedestrian signal heads complying with the provisions set forth in Chapter 4E of the OMUTCD. <table border="1" style="float: right; margin-top: 5px;"> <tr><td style="text-align: center;"><b>Peak Hour</b></td></tr> <tr><td style="text-align: center;">12:00 PM</td></tr> <tr><td style="text-align: center;">1:00 PM</td></tr> </table> | <b>Peak Hour</b> | 12:00 PM | 1:00 PM |
| <b>Peak Hour</b>   |             |            |  |                  |          |         |
| 12:00 PM   |             |            |  |                  |          |         |
| 1:00 PM  |             |            |  |                  |          |         |
| <b>Warrant 5, School Crossing</b>  | No          |            | N/A  |                  |          |         |
| <b>Warrant 6, Coordinated Signal System</b>  | No          |            | (Shall not be used as the sole warrant in the analysis)  |                  |          |         |
| <b>Warrant 7, Crash Experience</b>   | No          |            | If this is the sole warrant, signal must be semi-actuated with control devices which provide proper coordination if installed at an intersection within a coordinated system and normally should be fully traffic actuated if installed at an isolated intersection.   |                  |          |         |
| <b>Warrant 8, Roadway Network</b>  | No          |            | (Shall not be used as the sole warrant in the analysis)  |                  |          |         |
| <b>Warrant 9, Intersection Near a Grade Crossing</b>   | No          |            | Figure 4C-9  |                  |          |         |
| <b>Multi-Way Stop Warrant</b>  | Yes         | Yes        | May be used as an interim measure if traffic signal warrants are satisfied.  |                  |          |         |

**The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.**

|  |
|--|
| <p>If no warrants are satisfied, additional options may be considered:</p> <ol style="list-style-type: none"> <li>1. An engineering study, performed by a firm prequalified by ODOT for signal design, if approved by the ODOT district, may be used to justify a new signal installation or retention of an existing signal that otherwise does not meet the published warrants. An example of such an instance is a traffic signal in proximity to a railroad crossing that serves to reduce queuing across the tracks.</li> <li>2. According to TEM 402-2, If the actual turning movement counts fail to satisfy a signal warrant, it may be acceptable to use traffic volumes projected to the second year after project completion. The <b>Modeling and Forecasting Section</b> should provide the projected traffic volumes.</li> <li>3. A pedestrian hybrid beacon may be considered for installation to facilitate pedestrian crossings at a location that does not meet traffic signal warrants (see Chapter 4C of TEM) or at a location that meets traffic signal warrants under Sections 4C.05 and/or 4C.06 but a decision is made to not install a traffic control signal. <b>Please fill inputs on PHB Score Sheet and submit to ODOT.</b></li> </ol> |
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Considerations such as geometrics and lack of sight distance generally have not been accepted in lieu of satisfying signal warrants. These considerations may allow an otherwise unwarranted traffic signal to be retained at **100 percent** local cost. Please review TEM 402-4 for details.

Conclusion: Do Not Retain Existing Traffic Signal

Notes:

## OMUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

**Number of Lanes for Moving Traffic on Each Approach**

**Major Street:** 1 Lane

**Minor Street:** 1 Lane

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? **No**

*\*Only applicable after an adequate trial of other alternatives (See section 4C.02.06 of the 2012 OMUTCD)*

| Lanes<br>Major/<br>Minor | Adjusted<br>Volumes |       | Condition A |      |      |      | Condition B |      |      |      | Combination A/B* |      |         |      |         |      |         |      |
|--------------------------|---------------------|-------|-------------|------|------|------|-------------|------|------|------|------------------|------|---------|------|---------|------|---------|------|
|                          |                     |       | 100%        |      | 70%  |      | 100%        |      | 70%  |      | Cond. A          |      | Cond. B |      | Cond. A |      | Cond. B |      |
|                          | Major               | Minor | Maj.        | Min. | Maj. | Min. | Maj.        | Min. | Maj. | Min. | Maj.             | Min. | Maj.    | Min. | Maj.    | Min. | Maj.    | Min. |
| 1 / 1                    | X                   |       | 500         | 150  | 350  | 105  | 750         | 75   | 525  | 53   | 400              | 120  | 600     | 60   | 280     | 84   | 420     | 42   |
| 2+ / 1                   |                     |       | 600         | 150  | 420  | 105  | 900         | 75   | 630  | 53   | 480              | 120  | 720     | 60   | 336     | 84   | 504     | 42   |
| 2+ / 2+                  |                     |       | 600         | 200  | 420  | 140  | 900         | 100  | 630  | 70   | 480              | 160  | 720     | 80   | 336     | 112  | 504     | 56   |
| 1 / 2+                   |                     |       | 500         | 200  | 350  | 140  | 750         | 100  | 525  | 70   | 400              | 160  | 600     | 80   | 280     | 112  | 420     | 56   |
| 12:00 AM                 | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 12:15 AM                 | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 12:30 AM                 | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 12:45 AM                 | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 1:00 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 1:15 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 1:30 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 1:45 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 2:00 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 2:15 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 2:30 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 2:45 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 3:00 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 3:15 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 3:30 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 3:45 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 4:00 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 4:15 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 4:30 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 4:45 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 5:00 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 5:15 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 5:30 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 5:45 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 6:00 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 6:15 AM                  | 24                  | 7     |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 6:30 AM                  | 47                  | 11    |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 6:45 AM                  | 82                  | 19    |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 7:00 AM                  | 119                 | 29    |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 7:15 AM                  | 123                 | 29    |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 7:30 AM                  | 141                 | 33    |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 7:45 AM                  | 147                 | 34    |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 8:00 AM                  | 154                 | 32    |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 8:15 AM                  | 146                 | 38    |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 8:30 AM                  | 135                 | 48    |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 8:45 AM                  | 125                 | 48    |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 9:00 AM                  | 125                 | 50    |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 9:15 AM                  | 150                 | 46    |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 9:30 AM                  | 153                 | 37    |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |
| 9:45 AM                  | 166                 | 42    |             |      |      |      |             |      |      |      |                  |      |         |      |         |      |         |      |



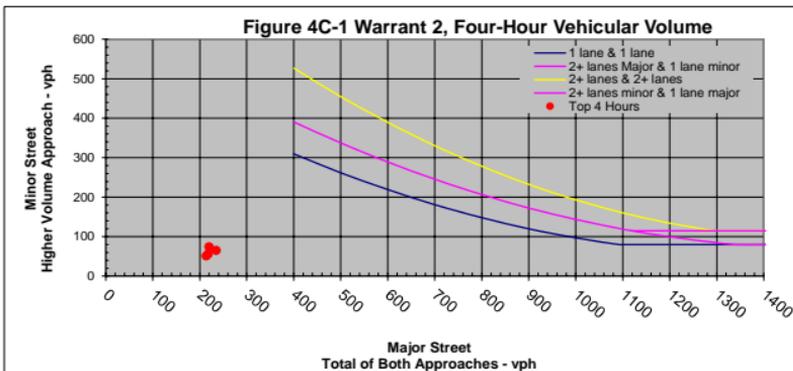
**OMUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME**

|   |   |   |
|---|---|---|
| Number of Lanes for Moving Traffic on Each Approach | Total Number of Unique Hours Met on Figure 4C-1 | 0 |
|---|---|---|

|                      |  |   |
|----------------------|--|---|
| Major street: 1 Lane | Total Number of Unique Hours Met on Figure 4C-2 (70% Factor) | 0 |
| Minor Street: 1 Lane |  |   |

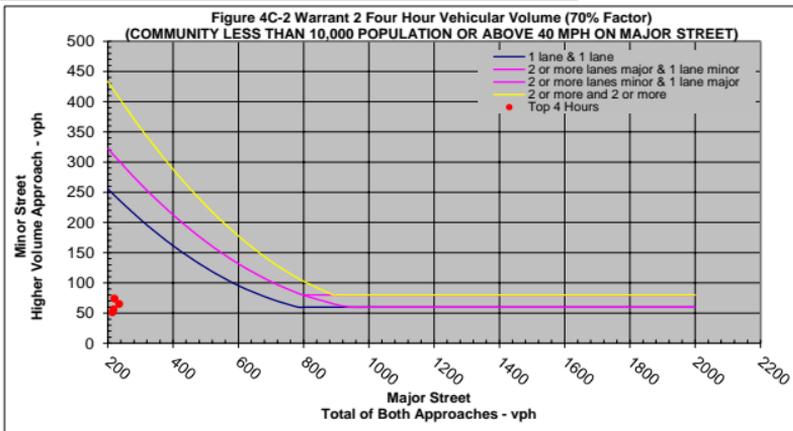
|   |    |
|---|----|
| Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? | No |
|---|----|

| Hour Interval Beginning At | Raw Traffic Counts |         |                  |         | Total Major Approach Volumes | Highest Actual Minor Street Approach Volumes | Hour Met? | Hour Met? (70% Factor) |
|----------------------------|--------------------|---------|------------------|---------|------------------------------|--|-----------|------------------------|
|                            | Major - 4th St     |         | Minor - Adams St |         |                              |  |           |                        |
|                            | N-Bound            | S-Bound | W-Bound          | E-Bound |                              |  |           |                        |
| 6:00 AM                    | 0                  | 0       | 0                | 0       | 0                            | 0  |           |                        |
| 6:15 AM                    | 12                 | 12      | 6                | 7       | 24                           | 7  |           |                        |
| 6:30 AM                    | 28                 | 19      | 11               | 9       | 47                           | 11   |           |                        |
| 6:45 AM                    | 49                 | 33      | 19               | 15      | 82                           | 19   |           |                        |
| 7:00 AM                    | 74                 | 45      | 29               | 24      | 119                          | 29   |           |                        |
| 7:15 AM                    | 79                 | 44      | 29               | 23      | 123                          | 29   |           |                        |
| 7:30 AM                    | 88                 | 52      | 31               | 33      | 141                          | 33   |           |                        |
| 7:45 AM                    | 87                 | 60      | 29               | 34      | 147                          | 34   |           |                        |
| 8:00 AM                    | 84                 | 70      | 31               | 32      | 154                          | 32   |           |                        |
| 8:15 AM                    | 79                 | 67      | 38               | 37      | 146                          | 38   |           |                        |
| 8:30 AM                    | 66                 | 69      | 48               | 34      | 135                          | 48   |           |                        |
| 8:45 AM                    | 61                 | 64      | 48               | 35      | 125                          | 48   |           |                        |
| 9:00 AM                    | 70                 | 55      | 50               | 41      | 125                          | 50   |           |                        |
| 9:15 AM                    | 83                 | 67      | 46               | 40      | 150                          | 46   |           |                        |
| 9:30 AM                    | 88                 | 65      | 37               | 36      | 153                          | 37   |           |                        |
| 9:45 AM                    | 95                 | 71      | 42               | 35      | 166                          | 42   |           |                        |
| 10:00 AM                   | 98                 | 79      | 38               | 33      | 177                          | 38   |           |                        |
| 10:15 AM                   | 92                 | 84      | 38               | 37      | 176                          | 38   |           |                        |
| 10:30 AM                   | 97                 | 95      | 45               | 40      | 192                          | 45   |           |                        |
| 10:45 AM                   | 107                | 97      | 45               | 44      | 204                          | 45   |           |                        |
| 11:00 AM                   | 89                 | 105     | 43               | 45      | 194                          | 45   |           |                        |
| 11:15 AM                   | 107                | 103     | 52               | 42      | 210                          | 52   |           |                        |
| 11:30 AM                   | 118                | 106     | 59               | 44      | 224                          | 59   |           |                        |
| 11:45 AM                   | 118                | 103     | 61               | 48      | 221                          | 61   |           |                        |
| 12:00 PM                   | 133                | 102     | 65               | 57      | 235                          | 65   |           |                        |
| 12:15 PM                   | 121                | 104     | 60               | 57      | 225                          | 60   |           |                        |
| 12:30 PM                   | 106                | 97      | 49               | 53      | 203                          | 53   |           |                        |
| 12:45 PM                   | 95                 | 105     | 45               | 48      | 200                          | 48   |           |                        |
| 1:00 PM                    | 97                 | 102     | 42               | 43      | 199                          | 43   |           |                        |
| 1:15 PM                    | 95                 | 97      | 41               | 45      | 192                          | 45   |           |                        |
| 1:30 PM                    | 113                | 93      | 36               | 50      | 206                          | 50   |           |                        |
| 1:45 PM                    | 120                | 94      | 37               | 51      | 214                          | 51   |           |                        |
| 2:00 PM                    | 123                | 92      | 45               | 58      | 215                          | 58   |           |                        |
| 2:15 PM                    | 122                | 106     | 54               | 60      | 228                          | 60   |           |                        |
| 2:30 PM                    | 108                | 120     | 68               | 59      | 228                          | 68   |           |                        |
| 2:45 PM                    | 100                | 120     | 74               | 57      | 220                          | 74   |           |                        |
| 3:00 PM                    | 90                 | 122     | 69               | 39      | 212                          | 69   |           |                        |
| 3:15 PM                    | 89                 | 127     | 59               | 44      | 216                          | 59   |           |                        |
| 3:30 PM                    | 90                 | 122     | 52               | 43      | 212                          | 52   |           |                        |
| 3:45 PM                    | 95                 | 119     | 51               | 41      | 214                          | 51   |           |                        |
| 4:00 PM                    | 93                 | 125     | 56               | 46      | 218                          | 56   |           |                        |
| 4:15 PM                    | 98                 | 111     | 59               | 41      | 209                          | 59   |           |                        |
| 4:30 PM                    | 99                 | 103     | 60               | 45      | 202                          | 60   |           |                        |
| 4:45 PM                    | 93                 | 101     | 60               | 43      | 194                          | 60   |           |                        |
| 5:00 PM                    | 84                 | 91      | 55               | 41      | 175                          | 55   |           |                        |
| 5:15 PM                    | 80                 | 91      | 43               | 34      | 171                          | 43   |           |                        |
| 5:30 PM                    | 70                 | 94      | 33               | 19      | 164                          | 33   |           |                        |
| 5:45 PM                    | 71                 | 80      | 21               | 19      | 151                          | 21   |           |                        |
| 6:00 PM                    | 74                 | 88      | 21               | 19      | 162                          | 21   |           |                        |
| 6:15 PM                    | 52                 | 63      | 16               | 14      | 115                          | 16   |           |                        |
| 6:30 PM                    | 37                 | 41      | 14               | 12      | 78                           | 14   |           |                        |
| 6:45 PM                    | 18                 | 29      | 10               | 8       | 47                           | 10   |           |                        |
| 7:00 PM                    | 0                  | 0       | 0                | 0       | 0                            | 0  |           |                        |
| 7:15 PM                    | 0                  | 0       | 0                | 0       | 0                            | 0  |           |                        |
| 7:30 PM                    | 0                  | 0       | 0                | 0       | 0                            | 0  |           |                        |
| 7:45 PM                    | 0                  | 0       | 0                | 0       | 0                            | 0  |           |                        |
| 8:00 PM                    | 0                  | 0       | 0                | 0       | 0                            | 0  |           |                        |



| Top Hours for Figure 4C-1 |          | Start Time | End Time | Major Street | Minor Street |
|---------------------------|----------|------------|----------|--------------|--------------|
| Top Hour                  | 2:45 PM  | 3:45 PM    | 220      | 74           |              |
| 2nd Highest Hour          | 12:00 PM | 1:00 PM    | 235      | 65           |              |
| 3rd Highest Hour          | 4:00 PM  | 5:00 PM    | 218      | 56           |              |
| 4th Highest Hour          | 1:45 PM  | 2:45 PM    | 214      | 51           |              |

| Top Hours for Figure 4C-2 |          | Start Time | End Time | Major Street | Minor Street |
|---------------------------|----------|------------|----------|--------------|--------------|
| Top Hour                  | 2:45 PM  | 3:45 PM    | 220      | 74           |              |
| 2nd Highest Hour          | 12:00 PM | 1:00 PM    | 235      | 65           |              |
| 3rd Highest Hour          | 4:00 PM  | 5:00 PM    | 218      | 56           |              |
| 4th Highest Hour          | 1:45 PM  | 2:45 PM    | 214      | 51           |              |



Are the requirements for Warrant 2 met?: No

### OMUTCD WARRANT 3, PEAK HOUR

|  |                             |          |
|--|-----------------------------|----------|
| <b>Number of Lanes for Moving Traffic on Each Approach</b> | <b>Peak Hour Start time</b> | 12:00 PM |
| Major Street: 1 Lane                                       | <b>Peak Hour End Time</b>   | 1:00 PM  |
| Minor Street: 1 Lane                                       |                             |          |

|  |    |
|--|----|
| <b>Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street?</b> | No |
|--|----|

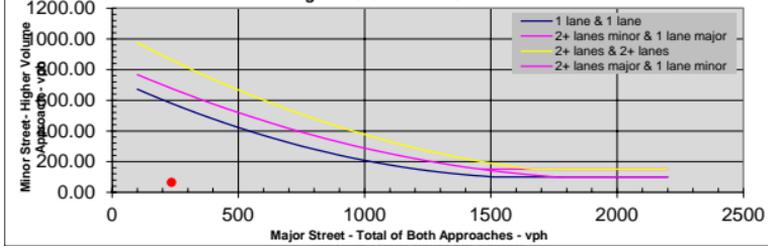
|   |    |
|---|----|
| Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time? | No |
|---|----|

|  |    |
|--|----|
| <b>Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present*</b>  |    |
| Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach? |    |
| Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?   | No |
| Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?                                | No |

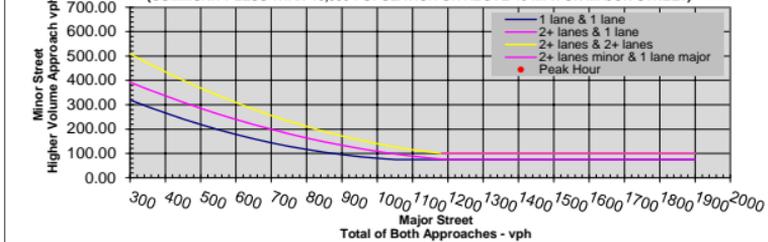
\*If applicable, attach all supporting calculations and documentation.

Are the requirements for Warrant 3 met?: No

**Figure 4C-3. Warrant 3 Peak Hour**



**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)**



| Hour Vehicular Volume      |   |   |  |   |
|----------------------------|---|---|--|---|
| Hour Interval Beginning At | Major Street Combined Vehicles Per Hour (VPH) | Highest Minor Street Approach Vehicles Per Hour (VPH) | Sum of Major Street and Highest Minor Street | Sum of Major Street and Combined Minor Street |
| 6:00 AM                    | 0   | 0   | 0  | 0   |
| 6:15 AM                    | 24  | 7   | 31   | 37  |
| 6:30 AM                    | 47  | 11  | 58   | 67  |
| 6:45 AM                    | 82  | 19  | 101  | 116   |
| 7:00 AM                    | 119   | 29  | 148  | 172   |
| 7:15 AM                    | 123   | 29  | 152  | 175   |
| 7:30 AM                    | 141   | 33  | 174  | 205   |
| 7:45 AM                    | 147   | 34  | 181  | 210   |
| 8:00 AM                    | 154   | 32  | 186  | 217   |
| 8:15 AM                    | 146   | 38  | 184  | 221   |
| 8:30 AM                    | 135   | 48  | 183  | 217   |
| 8:45 AM                    | 125   | 48  | 173  | 208   |
| 9:00 AM                    | 125   | 50  | 175  | 216   |
| 9:15 AM                    | 150   | 46  | 196  | 236   |
| 9:30 AM                    | 153   | 37  | 190  | 226   |
| 9:45 AM                    | 166   | 42  | 208  | 243   |
| 10:00 AM                   | 177   | 38  | 215  | 248   |
| 10:15 AM                   | 176   | 38  | 214  | 251   |
| 10:30 AM                   | 192   | 45  | 237  | 277   |
| 10:45 AM                   | 194   | 45  | 249  | 293   |
| 11:00 AM                   | 204   | 45  | 239  | 282   |
| 11:15 AM                   | 210   | 52  | 262  | 304   |
| 11:30 AM                   | 224   | 59  | 283  | 327   |
| 11:45 AM                   | 221   | 61  | 282  | 330   |
| 12:00 PM                   | 235   | 65  | 300  | 357   |
| 12:15 PM                   | 225   | 60  | 285  | 342   |
| 12:30 PM                   | 203   | 53  | 256  | 305   |
| 12:45 PM                   | 200   | 48  | 248  | 293   |
| 1:00 PM                    | 199   | 43  | 242  | 284   |
| 1:15 PM                    | 192   | 45  | 237  | 278   |
| 1:30 PM                    | 206   | 50  | 256  | 292   |
| 1:45 PM                    | 214   | 51  | 265  | 302   |
| 2:00 PM                    | 215   | 58  | 273  | 318   |
| 2:15 PM                    | 228   | 60  | 288  | 342   |
| 2:30 PM                    | 228   | 68  | 296  | 355   |
| 2:45 PM                    | 220   | 74  | 294  | 351   |
| 3:00 PM                    | 212   | 69  | 281  | 320   |
| 3:15 PM                    | 216   | 59  | 275  | 319   |
| 3:30 PM                    | 212   | 52  | 264  | 307   |
| 3:45 PM                    | 214   | 51  | 265  | 306   |
| 4:00 PM                    | 218   | 56  | 274  | 320   |
| 4:15 PM                    | 209   | 59  | 268  | 309   |
| 4:30 PM                    | 202   | 60  | 262  | 307   |
| 4:45 PM                    | 194   | 60  | 254  | 297   |
| 5:00 PM                    | 175   | 55  | 230  | 271   |
| 5:15 PM                    | 171   | 43  | 214  | 248   |
| 5:30 PM                    | 164   | 33  | 197  | 216   |
| 5:45 PM                    | 151   | 21  | 172  | 191   |
| 6:00 PM                    | 162   | 15  | 183  | 202   |
| 6:15 PM                    | 115   | 15  | 131  | 145   |
| 6:30 PM                    | 78  | 14  | 92   | 104   |
| 6:45 PM                    | 47  | 10  | 57   | 65  |
| 7:00 PM                    | 0   | 0   | 0  | 0   |
| 7:15 PM                    | 0   | 0   | 0  | 0   |
| 7:30 PM                    | 0   | 0   | 0  | 0   |
| 7:45 PM                    | 0   | 0   | 0  | 0   |
| 8:00 PM                    | 0   | 0   | 0  | 0   |

| Actual Peak Hour Major Traffic Volume | Actual Peak Hour Minor Traffic Volume | Required Peak Hour Minor Traffic Volume for Fig. 4C-3 | Required Peak Hour Minor Traffic Volume for Fig. 4C-4 |
|---------------------------------------|---------------------------------------|---|---|
| 235                                   | 65                                    | 580   | 358   |

## OMUTCD WARRANT 4, PEDESTRIAN VOLUME

| Hour Interval Beginning At                        | Major Street Combined Vehicles Per Hour (VPH) | Total of All Pedestrians Crossing Major Street Pedestrians Per Hour (PPH) |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
|---|---|---|---|-------------|--|---|------------|---|-------------|-------------|---------------------------|------------|----------|----------|-------------|------------------|----------|----------|-------------|---|------------------|---------|---------|-----|---|------------------|----------|----------|-----|---|------------------|----------|----------|-----|---|
| 6:00 AM   | 0   | 0   | <b>Built-up Isolated Community With Less Than 10,000 Population or Above 35 MPH on Major Street?</b> <span style="float: right; background-color: #C8E6C9; padding: 2px;">No</span>   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 6:15 AM   | 24  | 0   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 6:30 AM   | 47  | 0   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 6:45 AM   | 82  | 0   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 7:00 AM   | 119   | 2   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 7:15 AM   | 123   | 2   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 7:30 AM   | 141   | 3   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 7:45 AM   | 147   | 3   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 8:00 AM   | 154   | 1   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 8:15 AM   | 146   | 1   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 8:30 AM   | 135   | 1   | <b>15th Percentile Pedestrian Crossing Speed Less than 3.5 f/s?*</b> <span style="float: right; background-color: #C8E6C9; padding: 2px;">No</span><br><i>*If applicable, attach all supporting calculations, documentation, and findings.</i>  |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 8:45 AM   | 125   | 2   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 9:00 AM   | 125   | 5   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 9:15 AM   | 150   | 8   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 9:30 AM   | 153   | 7   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 9:45 AM   | 166   | 7   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 10:00 AM  | 177   | 8   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 10:15 AM  | 176   | 6   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 10:30 AM  | 192   | 7   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 10:45 AM  | 204   | 7   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 11:00 AM  | 194   | 5   | If 15th Percentile Pedestrian Crossing Speed is Less than 3.5 f/s, Reduce Criterion by (up to 50%): <span style="float: right; background-color: #FFF9C4; padding: 2px;"></span>  |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 11:15 AM  | 210   | 5   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 11:30 AM  | 224   | 5   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 11:45 AM  | 221   | 7   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 12:00 PM  | 235   | 5   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 12:15 PM  | 225   | 4   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 12:30 PM  | 203   | 3   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 12:45 PM  | 200   | 0   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 1:00 PM   | 199   | 2   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 1:15 PM   | 192   | 3   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 1:30 PM   | 206   | 3   | <b>Is the distance to the nearest traffic control signal or STOP sign controlling the major street that pedestrians desire to cross less than 300 feet?</b> <span style="float: right; background-color: #C8E6C9; padding: 2px;">No</span>  |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 1:45 PM   | 214   | 5   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 2:00 PM   | 215   | 8   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 2:15 PM   | 228   | 7   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 2:30 PM   | 228   | 8   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 2:45 PM   | 220   | 6   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 3:00 PM   | 212   | 6   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 3:15 PM   | 216   | 6   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 3:30 PM   | 212   | 5   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 3:45 PM   | 214   | 5   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 4:00 PM   | 218   | 0   | If the distance to the nearest traffic control signal or STOP sign controlling the major street that pedestrians desire to cross is less than 300 feet, will the proposed traffic control signal restrict the progressive movement of traffic? If applicable, attach supporting justification. <span style="float: right; background-color: #FFF9C4; padding: 2px;"></span>   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 4:15 PM   | 209   | 0   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 4:30 PM   | 202   | 1   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 4:45 PM   | 194   | 1   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 5:00 PM   | 175   | 2   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 5:15 PM   | 171   | 2   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 5:30 PM   | 164   | 2   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 5:45 PM   | 151   | 2   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 6:00 PM   | 162   | 2   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 6:15 PM   | 115   | 2   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 6:30 PM   | 78  | 1   | <b>Does the intersection meet the 4-Hour Volume?</b> <span style="float: right; background-color: #C8E6C9; padding: 2px;">No</span>   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 6:45 PM   | 47  | 1   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 7:00 PM   | 0   | 0   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 7:15 PM   | 0   | 0   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 7:30 PM   | 0   | 0   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 7:45 PM   | 0   | 0   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 8:00 PM   | 0   | 0   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
|   |   |   |   |             |  |   |            | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Top Hours for Figure 4C-5</th> <th>Start Time</th> <th>End Time</th> <th>Vehicles</th> <th>Pedestrians</th> </tr> </thead> <tbody> <tr> <td>Top Hour</td> <td>12:00 PM</td> <td>1:00 PM</td> <td>235</td> <td>5</td> </tr> <tr> <td>2nd Highest Hour</td> <td>2:15 PM</td> <td>3:15 PM</td> <td>228</td> <td>8</td> </tr> <tr> <td>3rd Highest Hour</td> <td>1:45 PM</td> <td>2:45 PM</td> <td>214</td> <td>5</td> </tr> <tr> <td>4th Highest Hour</td> <td>10:45 AM</td> <td>11:45 AM</td> <td>204</td> <td>7</td> </tr> </tbody> </table> |             |             | Top Hours for Figure 4C-5 | Start Time | End Time | Vehicles | Pedestrians | Top Hour         | 12:00 PM | 1:00 PM  | 235         | 5 | 2nd Highest Hour | 2:15 PM | 3:15 PM | 228 | 8 | 3rd Highest Hour | 1:45 PM  | 2:45 PM  | 214 | 5 | 4th Highest Hour | 10:45 AM | 11:45 AM | 204 | 7 |
| Top Hours for Figure 4C-5                         | Start Time                                    | End Time  |   |             |  |   |            | Vehicles  | Pedestrians |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| Top Hour  | 12:00 PM                                      | 1:00 PM   |   |             |  |   |            | 235   | 5           |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 2nd Highest Hour                                  | 2:15 PM                                       | 3:15 PM   | 228   | 8           |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 3rd Highest Hour                                  | 1:45 PM                                       | 2:45 PM   | 214   | 5           |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 4th Highest Hour                                  | 10:45 AM                                      | 11:45 AM  | 204   | 7           |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
|   |   |   | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Top Hours for Figure 4C-6</th> <th>Start Time</th> <th>End Time</th> <th>Vehicles</th> <th>Pedestrians</th> </tr> </thead> <tbody> <tr> <td>Top Hour</td> <td>12:00 PM</td> <td>1:00 PM</td> <td>235</td> <td>5</td> </tr> <tr> <td>2nd Highest Hour</td> <td>2:15 PM</td> <td>3:15 PM</td> <td>228</td> <td>8</td> </tr> <tr> <td>3rd Highest Hour</td> <td>1:45 PM</td> <td>2:45 PM</td> <td>214</td> <td>5</td> </tr> <tr> <td>4th Highest Hour</td> <td>10:45 AM</td> <td>11:45 AM</td> <td>204</td> <td>7</td> </tr> </tbody> </table> |             |  | Top Hours for Figure 4C-6                         | Start Time | End Time  | Vehicles    | Pedestrians | Top Hour                  | 12:00 PM   | 1:00 PM  | 235      | 5           | 2nd Highest Hour | 2:15 PM  | 3:15 PM  | 228         | 8 | 3rd Highest Hour | 1:45 PM | 2:45 PM | 214 | 5 | 4th Highest Hour | 10:45 AM | 11:45 AM | 204 | 7 |                  |          |          |     |   |
| Top Hours for Figure 4C-6                         | Start Time                                    | End Time  | Vehicles  | Pedestrians |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| Top Hour  | 12:00 PM                                      | 1:00 PM   | 235   | 5           |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 2nd Highest Hour                                  | 2:15 PM                                       | 3:15 PM   | 228   | 8           |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 3rd Highest Hour                                  | 1:45 PM                                       | 2:45 PM   | 214   | 5           |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 4th Highest Hour                                  | 10:45 AM                                      | 11:45 AM  | 204   | 7           |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
|   |   |   | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="5" style="text-align: center;">Peak Hour Used for Graphs 4C-7 &amp; 4C-8</th> </tr> <tr> <th colspan="5" style="text-align: center;">Top Hour</th> </tr> <tr> <th>Start Time</th> <th>End Time</th> <th>Vehicles</th> <th colspan="2">Pedestrians</th> </tr> </thead> <tbody> <tr> <td>12:00 PM</td> <td>1:00 PM</td> <td>235</td> <td colspan="2">5</td> </tr> </tbody> </table>  |             |  | Peak Hour Used for Graphs 4C-7 & 4C-8             |            |   |             |             | Top Hour                  |            |          |          |             | Start Time       | End Time | Vehicles | Pedestrians |   | 12:00 PM         | 1:00 PM | 235     | 5   |   |                  |          |          |     |   |                  |          |          |     |   |
| Peak Hour Used for Graphs 4C-7 & 4C-8             |   |   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| Top Hour  |   |   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| Start Time  | End Time                                      | Vehicles  | Pedestrians   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| 12:00 PM  | 1:00 PM                                       | 235   | 5   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
|   |   |   | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Number of Hours That Met the 4-Hour Criteria 4C-5</td> <td style="text-align: center;">0</td> </tr> </table>  |             |  | Number of Hours That Met the 4-Hour Criteria 4C-5 | 0          |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| Number of Hours That Met the 4-Hour Criteria 4C-5 | 0   |   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
|   |   |   | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Number of Hours That Met the 4-Hour Criteria 4C-6</td> <td style="text-align: center;">0</td> </tr> </table>  |             |  | Number of Hours That Met the 4-Hour Criteria 4C-6 | 0          |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |
| Number of Hours That Met the 4-Hour Criteria 4C-6 | 0   |   |   |             |  |   |            |   |             |             |                           |            |          |          |             |                  |          |          |             |   |                  |         |         |     |   |                  |          |          |     |   |                  |          |          |     |   |

Figure 4C-5. Warrant 4, Pedestrians Four-Hour Volume

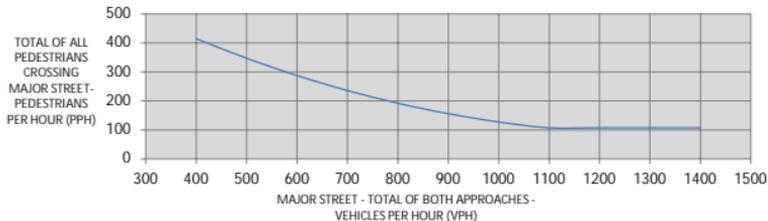


Figure 4C-6. Warrant 4, Pedestrian Four Hour Volume (70% Factor)

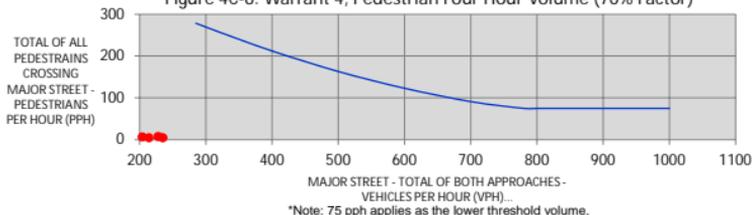


Figure 4C-7. Warrant 4, Pedestrian Peak Hour

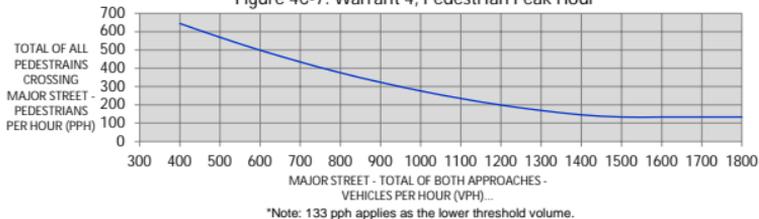
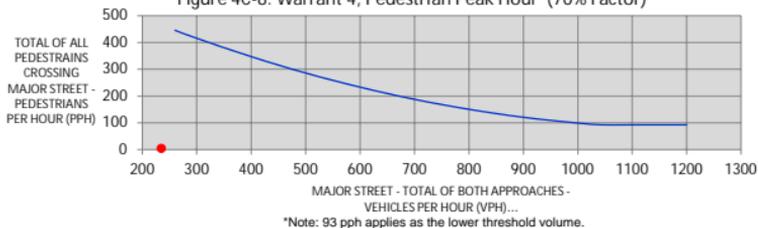


Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



## STUDY AND ANALYSIS INFORMATION

|                                   |                     |  |                         |
|-----------------------------------|---------------------|--|-------------------------|
| <b>Municipality:</b>              | Stubenville         | <b>Traffic Volumes Obtained By:</b>                      | Smart Services          |
| <b>County:</b>                    | Jefferson           | <b>Analysis Date:</b>                                    | 11/7/2024               |
| <b>ODOT Engineering District:</b> | 11                  | <b>Agency/ Company Name Performing Warrant Analysis:</b> | Strand Associates, Inc. |
| <b>Google map link:</b>           | <a href="#">Map</a> |  |                         |

### Analysis Information

**Data Collection Date:** 4/13/2021  
**Day of the Week:** Tuesday

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Existing Traffic Signal at intersection: Yes

Total Number of Approaches at Intersection: 4

### Major Street Information

Major Street Name and Route Number: Adams St

Major Street Approach Direction: E-Bound  
W-Bound

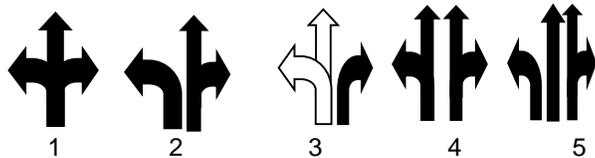
Number of Thru Lanes on Each Major Street Approach: 1 LANE(S)

Speed Limit or 85th Percentile Speed on the Major Street\*: 25 MPH  
\*Unknown assumes below 45 mph

### Minor Street Information

Minor Street Name and Route Number: 7th St

Minor Street Approach Configuration: 1 N-Bound  
1 S-Bound



Number of Thru Lanes on Each Minor Street Approach: 1 LANE(S)

Apply Right Turn Lane Reduction\*: Yes

\*Right Turn Lane Reduction Shall be used for Warrants 1, 2, & 3 for New ODOT Signals. Please refer to TEM 402-3.2 for clarification and criteria under which Right Turn Reduction is not required.

## TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

|  | Warrant     |            | Notes and Comments:   |                  |         |         |
|--|-------------|------------|---|------------------|---------|---------|
|  | Applicable? | Satisfied? |   |                  |         |         |
| <b>Warrant 1, Eight-Hour Vehicular Volume</b>  | Yes         | No         |   |                  |         |         |
| <b>Warrant 2, Four-Hour Vehicular Volume</b>   | Yes         | No         |   |                  |         |         |
| <b>Warrant 3, Peak Hour</b>  | Yes         | No         | Signals installed under Warrant 3 should be traffic actuated. <table border="1" style="float: right; margin-top: 5px;"> <tr><td style="text-align: center;"><b>Peak Hour</b></td></tr> <tr><td style="text-align: center;">2:30 PM</td></tr> <tr><td style="text-align: center;">3:30 PM</td></tr> </table>   | <b>Peak Hour</b> | 2:30 PM | 3:30 PM |
| <b>Peak Hour</b>   |             |            |   |                  |         |         |
| 2:30 PM  |             |            |   |                  |         |         |
| 3:30 PM  |             |            |   |                  |         |         |
| For Warrants 1-3, new ODOT signals must be based off of 100% volume thresholds (TEM 402-3.2) |             |            |   |                  |         |         |
| <b>Warrant 4, Pedestrian Volume</b>  | Yes         | No         | If this warrant is met, and a traffic control signal is justified by an engineering study, the traffic control signal shall be equipped with pedestrian signal heads complying with the provisions set forth in Chapter 4E of the OMUTCD. <table border="1" style="float: right; margin-top: 5px;"> <tr><td style="text-align: center;"><b>Peak Hour</b></td></tr> <tr><td style="text-align: center;">2:30 PM</td></tr> <tr><td style="text-align: center;">3:30 PM</td></tr> </table> | <b>Peak Hour</b> | 2:30 PM | 3:30 PM |
| <b>Peak Hour</b>   |             |            |   |                  |         |         |
| 2:30 PM  |             |            |   |                  |         |         |
| 3:30 PM  |             |            |   |                  |         |         |
| <b>Warrant 5, School Crossing</b>  | No          |            | N/A   |                  |         |         |
| <b>Warrant 6, Coordinated Signal System</b>  | No          |            | (Shall not be used as the sole warrant in the analysis)   |                  |         |         |
| <b>Warrant 7, Crash Experience</b>   | No          |            | If this is the sole warrant, signal must be semi-actuated with control devices which provide proper coordination if installed at an intersection within a coordinated system and normally should be fully traffic actuated if installed at an isolated intersection.  |                  |         |         |
| <b>Warrant 8, Roadway Network</b>  | No          |            | (Shall not be used as the sole warrant in the analysis)   |                  |         |         |
| <b>Warrant 9, Intersection Near a Grade Crossing</b>   | No          |            | Figure 4C-9   |                  |         |         |
| <b>Multi-Way Stop Warrant</b>  | Yes         | No         | May be used as an interim measure if traffic signal warrants are satisfied.   |                  |         |         |

**The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.**

|  |
|--|
| <p>If no warrants are satisfied, additional options may be considered:</p> <ol style="list-style-type: none"> <li>1. An engineering study, performed by a firm prequalified by ODOT for signal design, if approved by the ODOT district, may be used to justify a new signal installation or retention of an existing signal that otherwise does not meet the published warrants. An example of such an instance is a traffic signal in proximity to a railroad crossing that serves to reduce queuing across the tracks.</li> <li>2. According to TEM 402-2, If the actual turning movement counts fail to satisfy a signal warrant, it may be acceptable to use traffic volumes projected to the second year after project completion. The <b>Modeling and Forecasting Section</b> should provide the projected traffic volumes.</li> <li>3. A pedestrian hybrid beacon may be considered for installation to facilitate pedestrian crossings at a location that does not meet traffic signal warrants (see Chapter 4C of TEM) or at a location that meets traffic signal warrants under Sections 4C.05 and/or 4C.06 but a decision is made to not install a traffic control signal. <b>Please fill inputs on PHB Score Sheet and submit to ODOT.</b></li> </ol> |
|--|

Considerations such as geometrics and lack of sight distance generally have not been accepted in lieu of satisfying signal warrants. These considerations may allow an otherwise unwarranted traffic signal to be retained at **100 percent** local cost. Please review TEM 402-4 for details.

Conclusion: **Do Not Retain Existing Traffic Signal**

Notes:

## OMUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic  
on Each Approach

Major Street: 1 Lane

Minor Street: 1 Lane

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? No

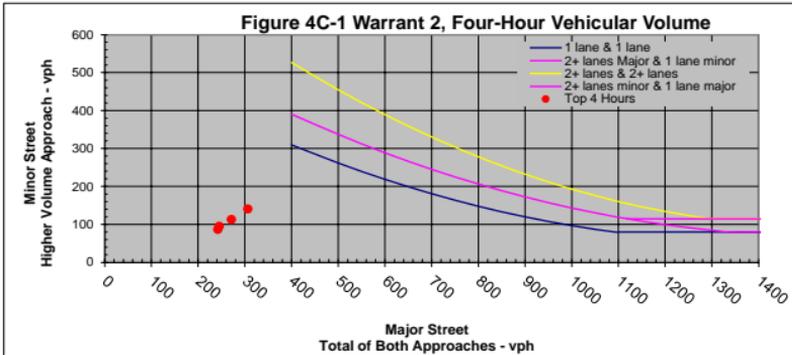
*\*Only applicable after an adequate trial of other alternatives (See section 4C.02.06 of the 2012 OMUTCD)*

| Lanes<br>Major/<br>Minor | Adjusted<br>Volumes |       | Condition A |      |      |      | Condition B |      |      |      | Combination A/B* |      |      |      |      |      |      |      |
|--------------------------|---------------------|-------|-------------|------|------|------|-------------|------|------|------|------------------|------|------|------|------|------|------|------|
|                          |                     |       | 100%        |      | 70%  |      | 100%        |      | 70%  |      | 80%              |      | 80%  |      | 56%  |      | 56%  |      |
|                          | Major               | Minor | Maj.        | Min. | Maj. | Min. | Maj.        | Min. | Maj. | Min. | Maj.             | Min. | Maj. | Min. | Maj. | Min. | Maj. | Min. |
| 1 / 1                    | X                   |       | 500         | 150  | 350  | 105  | 750         | 75   | 525  | 53   | 400              | 120  | 600  | 60   | 280  | 84   | 420  | 42   |
| 2+ / 1                   |                     |       | 600         | 150  | 420  | 105  | 900         | 75   | 630  | 53   | 480              | 120  | 720  | 60   | 336  | 84   | 504  | 42   |
| 2+ / 2+                  |                     |       | 600         | 200  | 420  | 140  | 900         | 100  | 630  | 70   | 480              | 160  | 720  | 80   | 336  | 112  | 504  | 56   |
| 1 / 2+                   |                     |       | 500         | 200  | 350  | 140  | 750         | 100  | 525  | 70   | 400              | 160  | 600  | 80   | 280  | 112  | 420  | 56   |
| 12:00 AM                 | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:15 AM                 | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:30 AM                 | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:45 AM                 | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:00 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:15 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:30 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:45 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:00 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:15 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:30 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:45 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:00 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:15 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:30 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:45 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:00 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:15 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:30 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:45 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:00 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:15 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:30 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:45 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:00 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:15 AM                  | 36                  | 11    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:30 AM                  | 74                  | 27    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:45 AM                  | 131                 | 43    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:00 AM                  | 188                 | 62    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:15 AM                  | 200                 | 74    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:30 AM                  | 216                 | 78    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:45 AM                  | 212                 | 97    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:00 AM                  | 201                 | 107   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:15 AM                  | 197                 | 99    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:30 AM                  | 189                 | 83    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:45 AM                  | 180                 | 66    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:00 AM                  | 179                 | 54    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:15 AM                  | 175                 | 62    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:30 AM                  | 171                 | 53    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:45 AM                  | 174                 | 68    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:00 AM                 | 181                 | 77    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:15 AM                 | 184                 | 71    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |



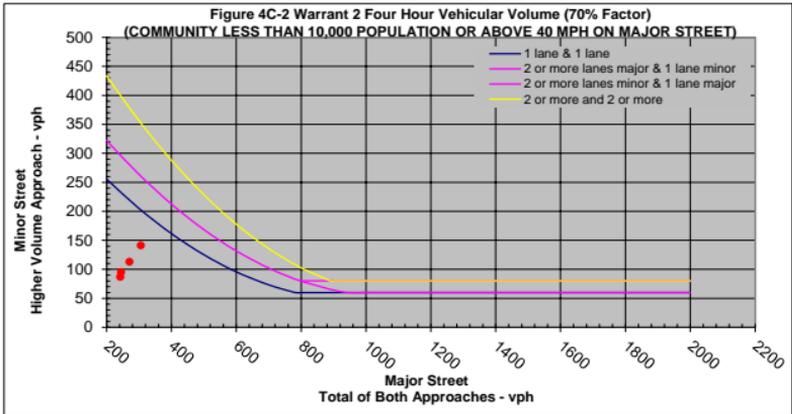
## OMUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

| Number of Lanes for Moving Traffic on Each Approach   |                    | Total Number of Unique Hours Met on Figure 4C-1              |                  |         |                              | 0  |           |                        |
|---|--------------------|--|------------------|---------|------------------------------|--|-----------|------------------------|
| Major street: 1 Lane  |                    | Total Number of Unique Hours Met on Figure 4C-2 (70% Factor) |                  |         |                              | 0  |           |                        |
| Minor Street: 1 Lane  |                    |  |                  |         |                              |  |           |                        |
| Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? |                    |  |                  |         |                              |  |           |                        |
| No  |                    |  |                  |         |                              |  |           |                        |
| Hour Interval Beginning At  | Raw Traffic Counts |  |                  |         | Total Major Approach Volumes | Highest Actual Minor Street Approach Volumes | Hour Met? | Hour Met? (70% Factor) |
|   | Minor - 7th St     |  | Major - Adams St |         |                              |  |           |                        |
|   | N-Bound            | S-Bound  | W-Bound          | E-Bound |                              |  |           |                        |
| 6:00 AM   | 0                  | 0  | 0                | 0       | 0                            | 0  |           |                        |
| 6:15 AM   | 2                  | 11   | 19               | 17      | 36                           | 11   |           |                        |
| 6:30 AM   | 4                  | 27   | 41               | 33      | 74                           | 27   |           |                        |
| 6:45 AM   | 7                  | 43   | 76               | 55      | 131                          | 43   |           |                        |
| 7:00 AM   | 11                 | 62   | 115              | 73      | 188                          | 62   |           |                        |
| 7:15 AM   | 12                 | 74   | 128              | 72      | 200                          | 74   |           |                        |
| 7:30 AM   | 17                 | 78   | 131              | 85      | 216                          | 78   |           |                        |
| 7:45 AM   | 25                 | 97   | 121              | 91      | 212                          | 97   |           |                        |
| 8:00 AM   | 26                 | 107  | 108              | 93      | 201                          | 107  |           |                        |
| 8:15 AM   | 32                 | 99   | 104              | 93      | 197                          | 99   |           |                        |
| 8:30 AM   | 28                 | 83   | 108              | 81      | 189                          | 83   |           |                        |
| 8:45 AM   | 20                 | 66   | 111              | 69      | 180                          | 66   |           |                        |
| 9:00 AM   | 18                 | 54   | 119              | 60      | 179                          | 54   |           |                        |
| 9:15 AM   | 13                 | 62   | 120              | 55      | 175                          | 62   |           |                        |
| 9:30 AM   | 15                 | 63   | 126              | 45      | 171                          | 63   |           |                        |
| 9:45 AM   | 20                 | 68   | 130              | 44      | 174                          | 68   |           |                        |
| 10:00 AM  | 22                 | 77   | 126              | 55      | 181                          | 77   |           |                        |
| 10:15 AM  | 22                 | 71   | 119              | 65      | 184                          | 71   |           |                        |
| 10:30 AM  | 19                 | 78   | 112              | 81      | 193                          | 78   |           |                        |
| 10:45 AM  | 15                 | 74   | 128              | 80      | 208                          | 74   |           |                        |
| 11:00 AM  | 14                 | 75   | 131              | 72      | 203                          | 75   |           |                        |
| 11:15 AM  | 21                 | 78   | 148              | 64      | 212                          | 78   |           |                        |
| 11:30 AM  | 25                 | 83   | 160              | 58      | 218                          | 83   |           |                        |
| 11:45 AM  | 23                 | 94   | 153              | 68      | 221                          | 94   |           |                        |
| 12:00 PM  | 21                 | 92   | 158              | 77      | 235                          | 92   |           |                        |
| 12:15 PM  | 14                 | 95   | 160              | 85      | 245                          | 95   |           |                        |
| 12:30 PM  | 15                 | 93   | 154              | 86      | 240                          | 93   |           |                        |
| 12:45 PM  | 16                 | 82   | 145              | 81      | 226                          | 82   |           |                        |
| 1:00 PM   | 21                 | 90   | 143              | 72      | 215                          | 90   |           |                        |
| 1:15 PM   | 23                 | 88   | 142              | 68      | 210                          | 88   |           |                        |
| 1:30 PM   | 22                 | 91   | 147              | 72      | 219                          | 91   |           |                        |
| 1:45 PM   | 24                 | 107  | 170              | 79      | 249                          | 107  |           |                        |
| 2:00 PM   | 25                 | 118  | 174              | 110     | 284                          | 118  |           |                        |
| 2:15 PM   | 28                 | 134  | 183              | 115     | 298                          | 134  |           |                        |
| 2:30 PM   | 27                 | 141  | 193              | 113     | 306                          | 141  |           |                        |
| 2:45 PM   | 28                 | 133  | 166              | 104     | 270                          | 133  |           |                        |
| 3:00 PM   | 27                 | 116  | 165              | 72      | 237                          | 116  |           |                        |
| 3:15 PM   | 38                 | 104  | 181              | 68      | 249                          | 104  |           |                        |
| 3:30 PM   | 42                 | 102  | 171              | 69      | 240                          | 102  |           |                        |
| 3:45 PM   | 45                 | 104  | 186              | 72      | 258                          | 104  |           |                        |
| 4:00 PM   | 48                 | 113  | 186              | 85      | 271                          | 113  |           |                        |
| 4:15 PM   | 39                 | 114  | 176              | 87      | 263                          | 114  |           |                        |
| 4:30 PM   | 37                 | 110  | 179              | 86      | 265                          | 110  |           |                        |
| 4:45 PM   | 32                 | 102  | 173              | 81      | 254                          | 102  |           |                        |
| 5:00 PM   | 24                 | 87   | 165              | 77      | 242                          | 87   |           |                        |
| 5:15 PM   | 15                 | 90   | 141              | 71      | 212                          | 90   |           |                        |
| 5:30 PM   | 12                 | 74   | 121              | 65      | 186                          | 74   |           |                        |
| 5:45 PM   | 10                 | 73   | 112              | 57      | 169                          | 73   |           |                        |
| 6:00 PM   | 11                 | 77   | 112              | 54      | 166                          | 77   |           |                        |
| 6:15 PM   | 9                  | 49   | 81               | 40      | 121                          | 49   |           |                        |
| 6:30 PM   | 5                  | 33   | 59               | 26      | 85                           | 33   |           |                        |
| 6:45 PM   | 3                  | 12   | 31               | 19      | 50                           | 12   |           |                        |
| 7:00 PM   | 0                  | 0  | 0                | 0       | 0                            | 0  |           |                        |
| 7:15 PM   | 0                  | 0  | 0                | 0       | 0                            | 0  |           |                        |
| 7:30 PM   | 0                  | 0  | 0                | 0       | 0                            | 0  |           |                        |
| 7:45 PM   | 0                  | 0  | 0                | 0       | 0                            | 0  |           |                        |
| 8:00 PM   | 0                  | 0  | 0                | 0       | 0                            | 0  |           |                        |



| Top Hours for Figure 4C-1 |          | Start Time | End Time | Major Street | Minor Street |
|---------------------------|----------|------------|----------|--------------|--------------|
| Top Hour                  | 2:30 PM  | 3:30 PM    | 306      | 141          |              |
| 2nd Highest Hour          | 4:00 PM  | 5:00 PM    | 271      | 113          |              |
| 3rd Highest Hour          | 12:15 PM | 1:15 PM    | 245      | 95           |              |
| 4th Highest Hour          | 5:00 PM  | 6:00 PM    | 242      | 87           |              |

| Top Hours for Figure 4C-2 |          | Start Time | End Time | Major Street | Minor Street |
|---------------------------|----------|------------|----------|--------------|--------------|
| Top Hour                  | 2:30 PM  | 3:30 PM    | 306      | 141          |              |
| 2nd Highest Hour          | 4:00 PM  | 5:00 PM    | 271      | 113          |              |
| 3rd Highest Hour          | 12:15 PM | 1:15 PM    | 245      | 95           |              |
| 4th Highest Hour          | 5:00 PM  | 6:00 PM    | 242      | 87           |              |



Are the requirements for Warrant 2 met?:

### OMUTCD WARRANT 3, PEAK HOUR

|   |                      |         |
|---|----------------------|---------|
| Number of Lanes for Moving Traffic on Each Approach | Peak Hour Start time | 2:30 PM |
| Major Street: 1 Lane                                | Peak Hour End Time   | 3:30 PM |
| Minor Street: 1 Lane                                |                      |         |

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street?

No

Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?

No

**Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present\***

Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?

Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?

Yes

Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?

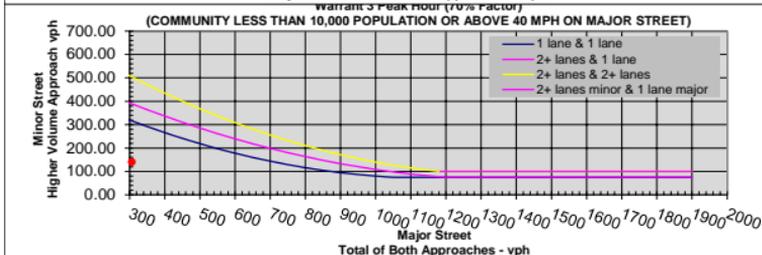
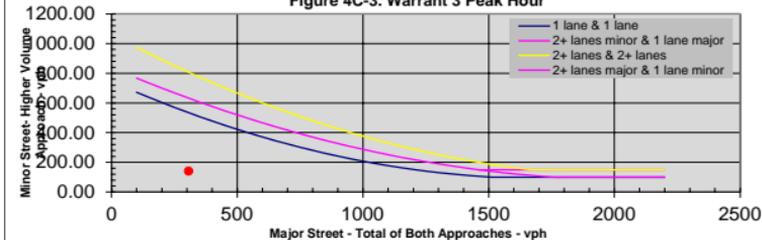
No

*\*If applicable, attach all supporting calculations and documentation.*

Are the requirements for Warrant 3 met?:

No

**Figure 4C-3. Warrant 3 Peak Hour**



| Hour Vehicular Volume      |   |   |  |   |
|----------------------------|---|---|--|---|
| Hour Interval Beginning At | Major Street Combined Vehicles Per Hour (VPH) | Highest Minor Street Approach Vehicles Per Hour (VPH) | Sum of Major Street and Highest Minor Street | Sum of Major Street and Combined Minor Street |
| 6:00 AM                    | 0   | 0   | 0  | 0   |
| 6:15 AM                    | 36  | 11  | 47   | 49  |
| 6:30 AM                    | 74  | 27  | 101  | 105   |
| 6:45 AM                    | 131   | 43  | 174  | 181   |
| 7:00 AM                    | 188   | 62  | 250  | 261   |
| 7:15 AM                    | 200   | 74  | 274  | 286   |
| 7:30 AM                    | 216   | 78  | 294  | 311   |
| 7:45 AM                    | 212   | 97  | 309  | 334   |
| 8:00 AM                    | 201   | 107   | 308  | 334   |
| 8:15 AM                    | 197   | 99  | 296  | 328   |
| 8:30 AM                    | 189   | 83  | 272  | 300   |
| 8:45 AM                    | 180   | 66  | 246  | 266   |
| 9:00 AM                    | 179   | 54  | 233  | 251   |
| 9:15 AM                    | 175   | 62  | 237  | 250   |
| 9:30 AM                    | 171   | 63  | 234  | 249   |
| 9:45 AM                    | 174   | 68  | 242  | 262   |
| 10:00 AM                   | 181   | 77  | 258  | 280   |
| 10:15 AM                   | 184   | 71  | 255  | 277   |
| 10:30 AM                   | 193   | 78  | 271  | 290   |
| 10:45 AM                   | 208   | 74  | 282  | 297   |
| 11:00 AM                   | 203   | 75  | 278  | 292   |
| 11:15 AM                   | 212   | 78  | 290  | 311   |
| 11:30 AM                   | 218   | 83  | 301  | 326   |
| 11:45 AM                   | 221   | 94  | 315  | 338   |
| 12:00 PM                   | 235   | 92  | 327  | 348   |
| 12:15 PM                   | 245   | 95  | 340  | 354   |
| 12:30 PM                   | 240   | 93  | 333  | 348   |
| 12:45 PM                   | 226   | 82  | 308  | 324   |
| 1:00 PM                    | 215   | 90  | 305  | 326   |
| 1:15 PM                    | 210   | 88  | 298  | 321   |
| 1:30 PM                    | 219   | 91  | 310  | 332   |
| 1:45 PM                    | 249   | 107   | 356  | 380   |
| 2:00 PM                    | 284   | 118   | 402  | 427   |
| 2:15 PM                    | 298   | 134   | 432  | 460   |
| 2:30 PM                    | 306   | 141   | 447  | 474   |
| 2:45 PM                    | 270   | 133   | 403  | 431   |
| 3:00 PM                    | 237   | 116   | 353  | 380   |
| 3:15 PM                    | 249   | 104   | 353  | 391   |
| 3:30 PM                    | 240   | 102   | 342  | 384   |
| 3:45 PM                    | 258   | 104   | 362  | 407   |
| 4:00 PM                    | 271   | 113   | 384  | 432   |
| 4:15 PM                    | 263   | 114   | 377  | 416   |
| 4:30 PM                    | 265   | 110   | 375  | 412   |
| 4:45 PM                    | 254   | 102   | 356  | 388   |
| 5:00 PM                    | 242   | 87  | 329  | 353   |
| 5:15 PM                    | 212   | 90  | 302  | 317   |
| 5:30 PM                    | 186   | 74  | 260  | 272   |
| 5:45 PM                    | 169   | 73  | 242  | 252   |
| 6:00 PM                    | 166   | 77  | 243  | 254   |
| 6:15 PM                    | 121   | 49  | 170  | 179   |
| 6:30 PM                    | 85  | 33  | 118  | 123   |
| 6:45 PM                    | 50  | 12  | 62   | 65  |
| 7:00 PM                    | 0   | 0   | 0  | 0   |
| 7:15 PM                    | 0   | 0   | 0  | 0   |
| 7:30 PM                    | 0   | 0   | 0  | 0   |
| 7:45 PM                    | 0   | 0   | 0  | 0   |
| 8:00 PM                    | 0   | 0   | 0  | 0   |

| Actual Peak Hour Major Traffic Volume | Actual Peak Hour Minor Traffic Volume | Required Peak Hour Minor Traffic Volume for Fig. 4C-3 | Required Peak Hour Minor Traffic Volume for Fig. 4C-4 |
|---------------------------------------|---------------------------------------|---|---|
| 306                                   | 141                                   | 535   | 316   |

## OMUTCD WARRANT 4, PEDESTRIAN VOLUME

| Hour Interval<br>Beginning At                        | Major Street<br>Combined<br>Vehicles Per<br>Hour (VPH) | Total of All<br>Pedestrians<br>Crossing Major<br>Street<br>Pedestrians Per<br>Hour (PPH) |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
|--|--|--|--|----|--|--|--|-------------|----------|----------|-------------|----------|---------|---------|-----|---|------------------|----------|----------|-------------|----|------------------|----------|---------|-----|---|------------------|----------|---------|-----|---|
| 6:00 AM  | 0  | 0  | <b>Built-up Isolated Community With Less Than 10,000 Population<br/>or Above 35 MPH on Major Street?</b> <span style="float: right; border: 1px solid black; padding: 2px;">No</span>  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 6:15 AM  | 36   | 0  | 15th Percentile Pedestrian Crossing Speed Less than 3.5 f/s? <span style="float: right; border: 1px solid black; padding: 2px;">No</span><br><i>* If applicable, attach all supporting calculations,<br/>documentation, and findings.</i>  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 6:30 AM  | 74   | 0  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 6:45 AM  | 131  | 1  | If 15th Percentile Pedestrian Crossing Speed is Less than 3.5 f/s,<br>Reduce Criterion by (up to 50%): <span style="float: right; border: 1px solid black; padding: 2px;"></span>  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 7:00 AM  | 188  | 1  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 7:15 AM  | 200  | 1  | <b>Is the distance to the nearest traffic control signal or STOP sign<br/>controlling the major street that pedestrians desire to cross<br/>less than 300 feet?</b> <span style="float: right; border: 1px solid black; padding: 2px;">No</span>   |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 7:30 AM  | 216  | 1  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 7:45 AM  | 212  | 0  | If the distance to the nearest traffic control signal or STOP sign controlling<br>the major street that pedestrians desire to cross is less than 300 feet, will the<br>proposed traffic control signal restrict the progressive movement of traffic? If<br>applicable, attach supporting justification. <span style="float: right; border: 1px solid black; padding: 2px;"></span>   |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 8:00 AM  | 201  | 0  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 8:15 AM  | 197  | 0  | <b>Does the intersection meet the 4-Hour Volume?</b> <span style="float: right; border: 1px solid black; padding: 2px;">No</span>  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 8:30 AM  | 189  | 0  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 8:45 AM  | 180  | 5  | <b>Does the intersection meet the Peak Hour?</b> <span style="float: right; border: 1px solid black; padding: 2px;">No</span>  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 9:00 AM  | 179  | 5  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 9:15 AM  | 175  | 5  | <b>Are the Requirements for Warrant 4 Satisfied?</b> <span style="float: right; border: 1px solid black; padding: 2px;">No</span>  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 9:30 AM  | 171  | 7  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 9:45 AM  | 174  | 2  | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Top Hours for Figure 4C-5</th> <th style="width: 10%;">Start Time</th> <th style="width: 10%;">End Time</th> <th style="width: 10%;">Vehicles</th> <th style="width: 10%;">Pedestrians</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Top Hour</td> <td style="text-align: center;">2:30 PM</td> <td style="text-align: center;">3:30 PM</td> <td style="text-align: center;">306</td> <td style="text-align: center;">5</td> </tr> <tr> <td style="text-align: center;">2nd Highest Hour</td> <td style="text-align: center;">4:00 PM</td> <td style="text-align: center;">5:00 PM</td> <td style="text-align: center;">271</td> <td style="text-align: center;">15</td> </tr> <tr> <td style="text-align: center;">3rd Highest Hour</td> <td style="text-align: center;">12:15 PM</td> <td style="text-align: center;">1:15 PM</td> <td style="text-align: center;">245</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="text-align: center;">4th Highest Hour</td> <td style="text-align: center;">5:00 PM</td> <td style="text-align: center;">6:00 PM</td> <td style="text-align: center;">242</td> <td style="text-align: center;">3</td> </tr> </tbody> </table> |    |  |  | Top Hours for Figure 4C-5                            | Start Time  | End Time | Vehicles | Pedestrians | Top Hour | 2:30 PM | 3:30 PM | 306 | 5 | 2nd Highest Hour | 4:00 PM  | 5:00 PM  | 271         | 15 | 3rd Highest Hour | 12:15 PM | 1:15 PM | 245 | 1 | 4th Highest Hour | 5:00 PM  | 6:00 PM | 242 | 3 |
| Top Hours for Figure 4C-5                            | Start Time   | End Time   |  |    |  |  | Vehicles   | Pedestrians |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| Top Hour   | 2:30 PM  | 3:30 PM  | 306  | 5  |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 2nd Highest Hour                                     | 4:00 PM  | 5:00 PM  | 271  | 15 |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 3rd Highest Hour                                     | 12:15 PM   | 1:15 PM  | 245  | 1  |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 4th Highest Hour                                     | 5:00 PM  | 6:00 PM  | 242  | 3  |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 10:00 AM   | 181  | 2  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 10:15 AM   | 184  | 2  | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Top Hours for Figure 4C-6</th> <th style="width: 10%;">Start Time</th> <th style="width: 10%;">End Time</th> <th style="width: 10%;">Vehicles</th> <th style="width: 10%;">Pedestrians</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Top Hour</td> <td style="text-align: center;">2:30 PM</td> <td style="text-align: center;">3:30 PM</td> <td style="text-align: center;">306</td> <td style="text-align: center;">5</td> </tr> <tr> <td style="text-align: center;">2nd Highest Hour</td> <td style="text-align: center;">4:00 PM</td> <td style="text-align: center;">5:00 PM</td> <td style="text-align: center;">271</td> <td style="text-align: center;">15</td> </tr> <tr> <td style="text-align: center;">3rd Highest Hour</td> <td style="text-align: center;">5:00 PM</td> <td style="text-align: center;">6:00 PM</td> <td style="text-align: center;">242</td> <td style="text-align: center;">3</td> </tr> <tr> <td style="text-align: center;">4th Highest Hour</td> <td style="text-align: center;">12:15 PM</td> <td style="text-align: center;">1:15 PM</td> <td style="text-align: center;">245</td> <td style="text-align: center;">1</td> </tr> </tbody> </table> |    |  |  | Top Hours for Figure 4C-6                            | Start Time  | End Time | Vehicles | Pedestrians | Top Hour | 2:30 PM | 3:30 PM | 306 | 5 | 2nd Highest Hour | 4:00 PM  | 5:00 PM  | 271         | 15 | 3rd Highest Hour | 5:00 PM  | 6:00 PM | 242 | 3 | 4th Highest Hour | 12:15 PM | 1:15 PM | 245 | 1 |
| Top Hours for Figure 4C-6                            | Start Time   | End Time   |  |    |  |  | Vehicles   | Pedestrians |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| Top Hour   | 2:30 PM  | 3:30 PM  | 306  | 5  |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 2nd Highest Hour                                     | 4:00 PM  | 5:00 PM  | 271  | 15 |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 3rd Highest Hour                                     | 5:00 PM  | 6:00 PM  | 242  | 3  |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 4th Highest Hour                                     | 12:15 PM   | 1:15 PM  | 245  | 1  |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 10:30 AM   | 183  | 3  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 10:45 AM   | 208  | 3  | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="5" style="text-align: center;">Peak Hour Used for Graphs 4C-7 &amp; 4C-8</th> </tr> <tr> <th colspan="5" style="text-align: center;">Top Hour</th> </tr> <tr> <th style="width: 15%;">Start Time</th> <th style="width: 15%;">End Time</th> <th style="width: 15%;">Vehicles</th> <th style="width: 15%;">Pedestrians</th> <th></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2:30 PM</td> <td style="text-align: center;">3:30 PM</td> <td style="text-align: center;">306</td> <td style="text-align: center;">5</td> <td></td> </tr> </tbody> </table>  |    |  |  | Peak Hour Used for Graphs 4C-7 & 4C-8                |             |          |          |             | Top Hour |         |         |     |   | Start Time       | End Time | Vehicles | Pedestrians |    | 2:30 PM          | 3:30 PM  | 306     | 5   |   |                  |          |         |     |   |
| Peak Hour Used for Graphs 4C-7 & 4C-8                |  |  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| Top Hour   |  |  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| Start Time   | End Time   | Vehicles   | Pedestrians  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 2:30 PM  | 3:30 PM  | 306  | 5  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 11:00 AM   | 203  | 3  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 11:15 AM   | 212  | 3  | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Number of Hours That Met the 4-Hour<br/>Criteria 4C-5</th> <th style="width: 50%;"></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td></td> </tr> </tbody> </table>  |    |  |  | Number of Hours That Met the 4-Hour<br>Criteria 4C-5 |             | 0        |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| Number of Hours That Met the 4-Hour<br>Criteria 4C-5 |  |  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 0  |  |  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 11:30 AM   | 218  | 4  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 11:45 AM   | 221  | 1  | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Number of Hours That Met the 4-Hour<br/>Criteria 4C-6</th> <th style="width: 50%;"></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td></td> </tr> </tbody> </table>  |    |  |  | Number of Hours That Met the 4-Hour<br>Criteria 4C-6 |             | 0        |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| Number of Hours That Met the 4-Hour<br>Criteria 4C-6 |  |  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 0  |  |  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 12:00 PM   | 235  | 1  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 12:15 PM   | 245  | 1  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 12:30 PM   | 240  | 1  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 12:45 PM   | 226  | 2  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 1:00 PM  | 215  | 2  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 1:15 PM  | 210  | 4  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 1:30 PM  | 219  | 3  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 1:45 PM  | 249  | 4  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 2:00 PM  | 284  | 5  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 2:15 PM  | 298  | 5  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 2:30 PM  | 306  | 5  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 2:45 PM  | 270  | 4  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 3:00 PM  | 237  | 8  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 3:15 PM  | 249  | 12   |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 3:30 PM  | 240  | 16   |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 3:45 PM  | 258  | 16   |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 4:00 PM  | 271  | 15   |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 4:15 PM  | 263  | 10   |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 4:30 PM  | 265  | 6  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 4:45 PM  | 254  | 7  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 5:00 PM  | 242  | 3  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 5:15 PM  | 212  | 3  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 5:30 PM  | 186  | 3  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 5:45 PM  | 169  | 1  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 6:00 PM  | 166  | 1  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 6:15 PM  | 121  | 0  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 6:30 PM  | 85   | 0  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 6:45 PM  | 50   | 0  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 7:00 PM  | 0  | 0  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 7:15 PM  | 0  | 0  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 7:30 PM  | 0  | 0  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 7:45 PM  | 0  | 0  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |
| 8:00 PM  | 0  | 0  |  |    |  |  |  |             |          |          |             |          |         |         |     |   |                  |          |          |             |    |                  |          |         |     |   |                  |          |         |     |   |

Figure 4C-5. Warrant 4, Pedestrians Four-Hour Volume

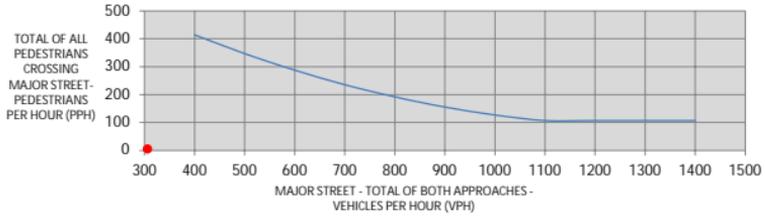


Figure 4C-6. Warrant 4, Pedestrian Four Hour Volume (70% Factor)

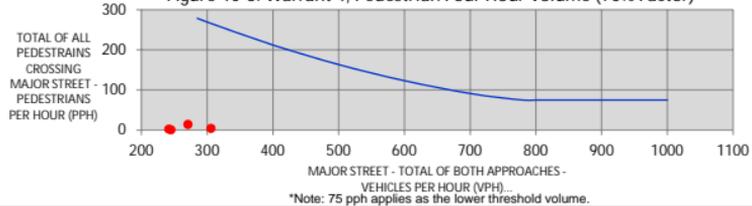


Figure 4C-7. Warrant 4, Pedestrian Peak Hour

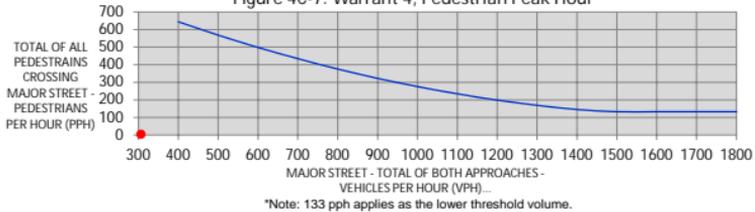
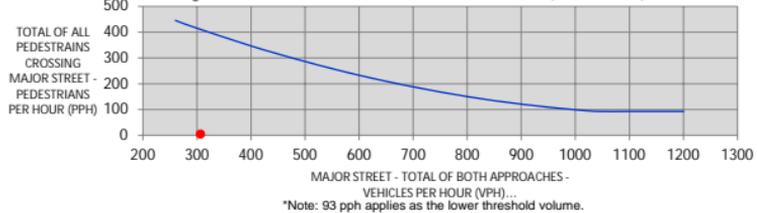


Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



## STUDY AND ANALYSIS INFORMATION

|                                   |                     |  |                         |
|-----------------------------------|---------------------|--|-------------------------|
| <b>Municipality:</b>              | Stubenville         | <b>Traffic Volumes Obtained By:</b>                      | Smart Services          |
| <b>County:</b>                    | Jefferson           | <b>Analysis Date:</b>                                    | 11/6/2024               |
| <b>ODOT Engineering District:</b> | 11                  | <b>Agency/ Company Name Performing Warrant Analysis:</b> | Strand Associates, Inc. |
| <b>Google map link:</b>           | <a href="#">Map</a> |  |                         |

### Analysis Information

**Data Collection Date:** 9/10/2024  
**Day of the Week:** Tuesday

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Existing Traffic Signal at intersection: Yes

Total Number of Approaches at Intersection: 4

### Major Street Information

Major Street Name and Route Number: 4th St

Major Street Approach Direction: N-Bound  
S-Bound

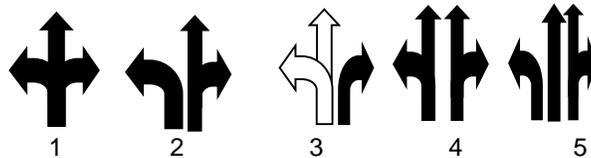
Number of Thru Lanes on Each Major Street Approach: 1 LANE(S)

Speed Limit or 85th Percentile Speed on the Major Street\*: 25 MPH  
\*Unknown assumes below 45 mph

### Minor Street Information

Minor Street Name and Route Number: Dock St

Minor Street Approach Configuration: 1 E-Bound  
1 W-Bound



Number of Thru Lanes on Each Minor Street Approach: 1 LANE(S)  
 Apply Right Turn Lane Reduction\*: Yes

\*Right Turn Lane Reduction Shall be used for Warrants 1, 2, & 3 for New ODOT Signals. Please refer to TEM 402-3.2 for clarification and criteria under which Right Turn Reduction is not required.

## TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

|  | Warrant     |            | Notes and Comments:   |                  |         |         |
|--|-------------|------------|---|------------------|---------|---------|
|  | Applicable? | Satisfied? |   |                  |         |         |
| <b>Warrant 1, Eight-Hour Vehicular Volume</b>  | Yes         | No         |   |                  |         |         |
| <b>Warrant 2, Four-Hour Vehicular Volume</b>   | Yes         | No         |   |                  |         |         |
| <b>Warrant 3, Peak Hour</b>  | Yes         | No         | Signals installed under Warrant 3 should be traffic actuated. <table border="1" style="float: right; margin-top: 5px;"> <tr><td style="text-align: center;"><b>Peak Hour</b></td></tr> <tr><td style="text-align: center;">7:45 AM</td></tr> <tr><td style="text-align: center;">8:45 AM</td></tr> </table>   | <b>Peak Hour</b> | 7:45 AM | 8:45 AM |
| <b>Peak Hour</b>   |             |            |   |                  |         |         |
| 7:45 AM  |             |            |   |                  |         |         |
| 8:45 AM  |             |            |   |                  |         |         |
| For Warrants 1-3, new ODOT signals must be based off of 100% volume thresholds (TEM 402-3.2) |             |            |   |                  |         |         |
| <b>Warrant 4, Pedestrian Volume</b>  | Yes         | No         | If this warrant is met, and a traffic control signal is justified by an engineering study, the traffic control signal shall be equipped with pedestrian signal heads complying with the provisions set forth in Chapter 4E of the OMUTCD. <table border="1" style="float: right; margin-top: 5px;"> <tr><td style="text-align: center;"><b>Peak Hour</b></td></tr> <tr><td style="text-align: center;">2:15 PM</td></tr> <tr><td style="text-align: center;">3:15 PM</td></tr> </table> | <b>Peak Hour</b> | 2:15 PM | 3:15 PM |
| <b>Peak Hour</b>   |             |            |   |                  |         |         |
| 2:15 PM  |             |            |   |                  |         |         |
| 3:15 PM  |             |            |   |                  |         |         |
| <b>Warrant 5, School Crossing</b>  | No          |            | N/A   |                  |         |         |
| <b>Warrant 6, Coordinated Signal System</b>  | No          |            | (Shall not be used as the sole warrant in the analysis)   |                  |         |         |
| <b>Warrant 7, Crash Experience</b>   | No          |            | If this is the sole warrant, signal must be semi-actuated with control devices which provide proper coordination if installed at an intersection within a coordinated system and normally should be fully traffic actuated if installed at an isolated intersection.  |                  |         |         |
| <b>Warrant 8, Roadway Network</b>  | No          |            | (Shall not be used as the sole warrant in the analysis)   |                  |         |         |
| <b>Warrant 9, Intersection Near a Grade Crossing</b>   | No          |            | Figure 4C-9   |                  |         |         |
| <b>Multi-Way Stop Warrant</b>  | Yes         | Yes        | May be used as an interim measure if traffic signal warrants are satisfied.   |                  |         |         |

**The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.**

|  |
|--|
| <p>If no warrants are satisfied, additional options may be considered:</p> <ol style="list-style-type: none"> <li>1. An engineering study, performed by a firm prequalified by ODOT for signal design, if approved by the ODOT district, may be used to justify a new signal installation or retention of an existing signal that otherwise does not meet the published warrants. An example of such an instance is a traffic signal in proximity to a railroad crossing that serves to reduce queuing across the tracks.</li> <li>2. According to TEM 402-2, If the actual turning movement counts fail to satisfy a signal warrant, it may be acceptable to use traffic volumes projected to the second year after project completion. The <b>Modeling and Forecasting Section</b> should provide the projected traffic volumes.</li> <li>3. A pedestrian hybrid beacon may be considered for installation to facilitate pedestrian crossings at a location that does not meet traffic signal warrants (see Chapter 4C of TEM) or at a location that meets traffic signal warrants under Sections 4C.05 and/or 4C.06 but a decision is made to not install a traffic control signal. <b>Please fill inputs on PHB Score Sheet and submit to ODOT.</b></li> </ol> |
|--|

Considerations such as geometrics and lack of sight distance generally have not been accepted in lieu of satisfying signal warrants. These considerations may allow an otherwise unwarranted traffic signal to be retained at **100 percent** local cost. Please review TEM 402-4 for details.

Conclusion: **Do Not Retain Existing Traffic Signal**

Notes: Westbound approach and eastbound outbound closed due to construction.

## OMUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

**Number of Lanes for Moving Traffic on Each Approach**

|                      |        |
|----------------------|--------|
| <b>Major Street:</b> | 1 Lane |
| <b>Minor Street:</b> | 1 Lane |

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? No

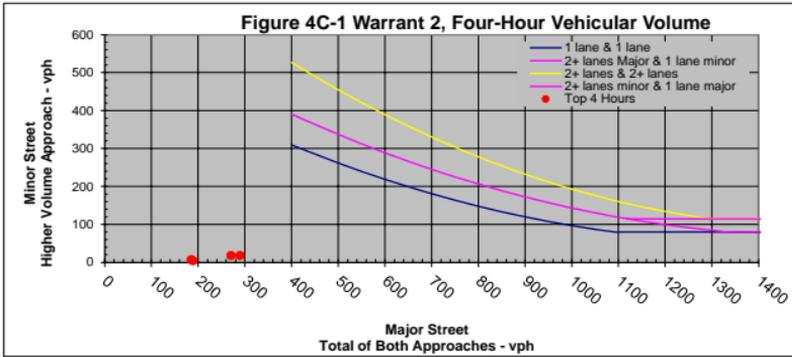
*\*Only applicable after an adequate trial of other alternatives (See section 4C.02.06 of the 2012 OMUTCD)*

| Lanes Major/Minor | Adjusted Volumes |       | Condition A |      |      |      | Condition B |      |      |      | Combination A/B* |      |      |      |      |      |      |      |
|-------------------|------------------|-------|-------------|------|------|------|-------------|------|------|------|------------------|------|------|------|------|------|------|------|
|                   |                  |       | 100%        |      | 70%  |      | 100%        |      | 70%  |      | 80%              |      | 80%  |      | 56%  |      | 56%  |      |
|                   | Major            | Minor | Maj.        | Min. | Maj. | Min. | Maj.        | Min. | Maj. | Min. | Maj.             | Min. | Maj. | Min. | Maj. | Min. | Maj. | Min. |
| 1 / 1             | X                |       | 500         | 150  | 350  | 105  | 750         | 75   | 525  | 53   | 400              | 120  | 600  | 60   | 280  | 84   | 420  | 42   |
| 2+ / 1            |                  |       | 600         | 150  | 420  | 105  | 900         | 75   | 630  | 53   | 480              | 120  | 720  | 60   | 336  | 84   | 504  | 42   |
| 2+ / 2+           |                  |       | 600         | 200  | 420  | 140  | 900         | 100  | 630  | 70   | 480              | 160  | 720  | 80   | 336  | 112  | 504  | 56   |
| 1 / 2+            |                  |       | 500         | 200  | 350  | 140  | 750         | 100  | 525  | 70   | 400              | 160  | 600  | 80   | 280  | 112  | 420  | 56   |
| 12:00 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:15 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:30 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:45 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:15 AM           | 23               | 1     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:30 AM           | 62               | 2     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:45 AM           | 116              | 5     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:00 AM           | 183              | 7     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:15 AM           | 212              | 12    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:30 AM           | 253              | 16    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:45 AM           | 289              | 18    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:00 AM           | 264              | 18    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:15 AM           | 242              | 13    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:30 AM           | 189              | 9     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:45 AM           | 127              | 4     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:00 AM           | 115              | 3     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:15 AM           | 115              | 3     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:30 AM           | 105              | 4     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:45 AM           | 110              | 5     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:00 AM          | 111              | 3     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:15 AM          | 119              | 3     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |



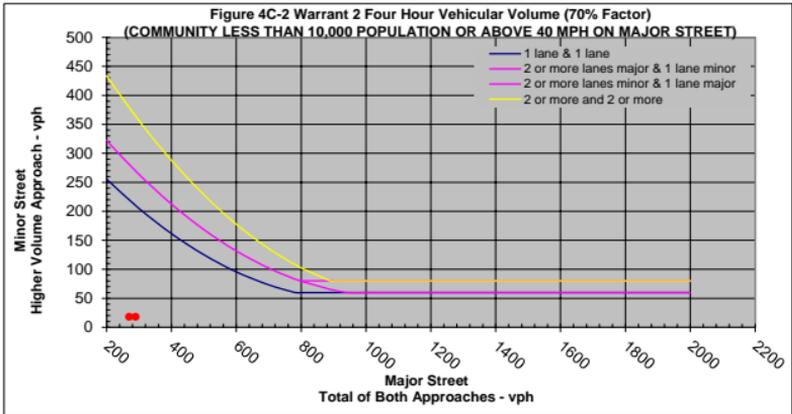
## OMUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

| Number of Lanes for Moving Traffic on Each Approach   |                    | Total Number of Unique Hours Met on Figure 4C-1              |                 |         |                              | 0  |           |                        |
|---|--------------------|--|-----------------|---------|------------------------------|--|-----------|------------------------|
| Major street: 1 Lane  |                    | Total Number of Unique Hours Met on Figure 4C-2 (70% Factor) |                 |         |                              | 0  |           |                        |
| Minor Street: 1 Lane  |                    | Factor)  |                 |         |                              | 0  |           |                        |
| Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? |                    |  |                 |         |                              |  | No        |                        |
| Hour Interval Beginning At  | Raw Traffic Counts |  |                 |         | Total Major Approach Volumes | Highest Actual Minor Street Approach Volumes | Hour Met? | Hour Met? (70% Factor) |
|   | Major - 4th St     |  | Minor - Dock St |         |                              |  |           |                        |
|   | N-Bound            | S-Bound  | W-Bound         | E-Bound |                              |  |           |                        |
| 6:00 AM   | 0                  | 0  | 0               | 0       | 0                            | 0  |           |                        |
| 6:15 AM   | 16                 | 7  | 0               | 1       | 23                           | 1  |           |                        |
| 6:30 AM   | 40                 | 22   | 0               | 2       | 62                           | 2  |           |                        |
| 6:45 AM   | 73                 | 43   | 0               | 5       | 116                          | 5  |           |                        |
| 7:00 AM   | 124                | 59   | 0               | 7       | 183                          | 7  |           |                        |
| 7:15 AM   | 152                | 60   | 0               | 12      | 212                          | 12   |           |                        |
| 7:30 AM   | 193                | 60   | 0               | 16      | 253                          | 16   |           |                        |
| 7:45 AM   | 210                | 79   | 0               | 18      | 289                          | 18   |           |                        |
| 8:00 AM   | 182                | 82   | 0               | 18      | 264                          | 18   |           |                        |
| 8:15 AM   | 156                | 86   | 0               | 13      | 242                          | 13   |           |                        |
| 8:30 AM   | 103                | 86   | 0               | 9       | 189                          | 9  |           |                        |
| 8:45 AM   | 67                 | 60   | 0               | 4       | 127                          | 4  |           |                        |
| 9:00 AM   | 61                 | 54   | 0               | 3       | 115                          | 3  |           |                        |
| 9:15 AM   | 62                 | 53   | 0               | 3       | 115                          | 3  |           |                        |
| 9:30 AM   | 60                 | 45   | 0               | 4       | 105                          | 4  |           |                        |
| 9:45 AM   | 61                 | 49   | 0               | 5       | 110                          | 5  |           |                        |
| 10:00 AM  | 57                 | 54   | 0               | 3       | 111                          | 3  |           |                        |
| 10:15 AM  | 61                 | 58   | 0               | 3       | 119                          | 3  |           |                        |
| 10:30 AM  | 69                 | 87   | 0               | 2       | 156                          | 2  |           |                        |
| 10:45 AM  | 81                 | 86   | 0               | 2       | 167                          | 2  |           |                        |
| 11:00 AM  | 91                 | 94   | 0               | 2       | 185                          | 2  |           |                        |
| 11:15 AM  | 93                 | 96   | 0               | 4       | 189                          | 4  |           |                        |
| 11:30 AM  | 94                 | 68   | 0               | 5       | 162                          | 5  |           |                        |
| 11:45 AM  | 85                 | 73   | 0               | 5       | 158                          | 5  |           |                        |
| 12:00 PM  | 93                 | 55   | 0               | 7       | 148                          | 7  |           |                        |
| 12:15 PM  | 86                 | 51   | 0               | 6       | 137                          | 6  |           |                        |
| 12:30 PM  | 86                 | 57   | 0               | 5       | 143                          | 5  |           |                        |
| 12:45 PM  | 93                 | 60   | 0               | 4       | 153                          | 4  |           |                        |
| 1:00 PM   | 95                 | 71   | 0               | 4       | 166                          | 4  |           |                        |
| 1:15 PM   | 103                | 81   | 0               | 4       | 184                          | 4  |           |                        |
| 1:30 PM   | 120                | 83   | 0               | 6       | 203                          | 6  |           |                        |
| 1:45 PM   | 135                | 103  | 0               | 8       | 238                          | 8  |           |                        |
| 2:00 PM   | 147                | 107  | 0               | 10      | 254                          | 10   |           |                        |
| 2:15 PM   | 147                | 123  | 0               | 18      | 270                          | 18   |           |                        |
| 2:30 PM   | 133                | 119  | 0               | 19      | 252                          | 19   |           |                        |
| 2:45 PM   | 124                | 86   | 0               | 17      | 210                          | 17   |           |                        |
| 3:00 PM   | 110                | 85   | 0               | 15      | 195                          | 15   |           |                        |
| 3:15 PM   | 108                | 62   | 0               | 8       | 170                          | 8  |           |                        |
| 3:30 PM   | 106                | 67   | 0               | 6       | 173                          | 6  |           |                        |
| 3:45 PM   | 107                | 78   | 0               | 7       | 185                          | 7  |           |                        |
| 4:00 PM   | 95                 | 71   | 0               | 4       | 166                          | 4  |           |                        |
| 4:15 PM   | 93                 | 68   | 0               | 2       | 161                          | 2  |           |                        |
| 4:30 PM   | 96                 | 71   | 0               | 2       | 167                          | 2  |           |                        |
| 4:45 PM   | 85                 | 69   | 0               | 4       | 154                          | 4  |           |                        |
| 5:00 PM   | 77                 | 69   | 0               | 4       | 146                          | 4  |           |                        |
| 5:15 PM   | 67                 | 71   | 0               | 4       | 138                          | 4  |           |                        |
| 5:30 PM   | 57                 | 64   | 0               | 4       | 121                          | 4  |           |                        |
| 5:45 PM   | 50                 | 55   | 0               | 0       | 105                          | 0  |           |                        |
| 6:00 PM   | 63                 | 54   | 0               | 0       | 117                          | 0  |           |                        |
| 6:15 PM   | 51                 | 39   | 0               | 0       | 90                           | 0  |           |                        |
| 6:30 PM   | 38                 | 26   | 0               | 0       | 64                           | 0  |           |                        |
| 6:45 PM   | 24                 | 14   | 0               | 0       | 38                           | 0  |           |                        |
| 7:00 PM   | 0                  | 0  | 0               | 0       | 0                            | 0  |           |                        |
| 7:15 PM   | 0                  | 0  | 0               | 0       | 0                            | 0  |           |                        |
| 7:30 PM   | 0                  | 0  | 0               | 0       | 0                            | 0  |           |                        |
| 7:45 PM   | 0                  | 0  | 0               | 0       | 0                            | 0  |           |                        |
| 8:00 PM   | 0                  | 0  | 0               | 0       | 0                            | 0  |           |                        |



| Top Hours for Figure 4C-1 |            |          |              |              |
|---------------------------|------------|----------|--------------|--------------|
|                           | Start Time | End Time | Major Street | Minor Street |
| Top Hour                  | 7:45 AM    | 8:45 AM  | 289          | 18           |
| 2nd Highest Hour          | 2:15 PM    | 3:15 PM  | 270          | 18           |
| 3rd Highest Hour          | 3:45 PM    | 4:45 PM  | 185          | 7            |
| 4th Highest Hour          | 11:15 AM   | 12:15 PM | 189          | 4            |

| Top Hours for Figure 4C-2 |            |          |              |              |
|---------------------------|------------|----------|--------------|--------------|
|                           | Start Time | End Time | Major Street | Minor Street |
| Top Hour                  | 7:45 AM    | 8:45 AM  | 289          | 18           |
| 2nd Highest Hour          | 2:15 PM    | 3:15 PM  | 270          | 18           |
| 3rd Highest Hour          | 3:45 PM    | 4:45 PM  | 185          | 7            |
| 4th Highest Hour          | 11:15 AM   | 12:15 PM | 189          | 4            |



Are the requirements for Warrant 2 met?:  No

### OMUTCD WARRANT 3, PEAK HOUR

|   |                      |         |
|---|----------------------|---------|
| Number of Lanes for Moving Traffic on Each Approach | Peak Hour Start time | 7:45 AM |
| Major Street: 1 Lane                                | Peak Hour End Time   | 8:45 AM |
| Minor Street: 1 Lane                                |                      |         |

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street?

No

Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?

No

**Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present\***

Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?

Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?

No

Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?

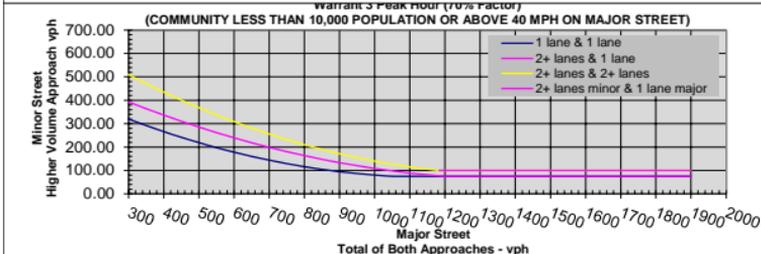
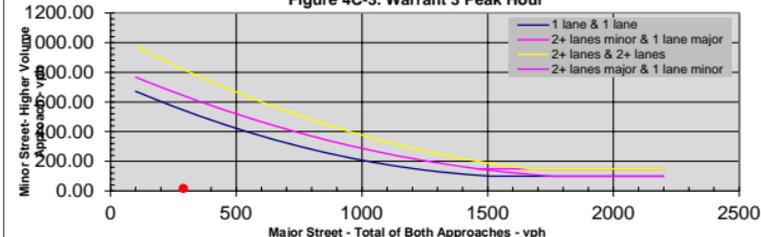
No

\*If applicable, attach all supporting calculations and documentation.

Are the requirements for Warrant 3 met?:

No

**Figure 4C-3. Warrant 3 Peak Hour**



| Hour Vehicular Volume      |   |   |  |   |
|----------------------------|---|---|--|---|
| Hour Interval Beginning At | Major Street Combined Vehicles Per Hour (VPH) | Highest Minor Street Approach Vehicles Per Hour (VPH) | Sum of Major Street and Highest Minor Street | Sum of Major Street and Combined Minor Street |
| 6:00 AM                    | 0   | 0   | 0  | 0   |
| 6:15 AM                    | 23  | 1   | 24   | 24  |
| 6:30 AM                    | 62  | 2   | 64   | 64  |
| 6:45 AM                    | 116   | 5   | 121  | 121   |
| 7:00 AM                    | 183   | 7   | 190  | 190   |
| 7:15 AM                    | 212   | 12  | 224  | 224   |
| 7:30 AM                    | 253   | 16  | 269  | 269   |
| 7:45 AM                    | 289   | 18  | 307  | 307   |
| 8:00 AM                    | 264   | 18  | 282  | 282   |
| 8:15 AM                    | 242   | 13  | 255  | 255   |
| 8:30 AM                    | 189   | 9   | 198  | 198   |
| 8:45 AM                    | 127   | 4   | 131  | 131   |
| 9:00 AM                    | 115   | 3   | 118  | 118   |
| 9:15 AM                    | 115   | 3   | 118  | 118   |
| 9:30 AM                    | 105   | 4   | 109  | 109   |
| 9:45 AM                    | 110   | 5   | 115  | 115   |
| 10:00 AM                   | 111   | 3   | 114  | 114   |
| 10:15 AM                   | 119   | 3   | 122  | 122   |
| 10:30 AM                   | 156   | 2   | 158  | 158   |
| 10:45 AM                   | 167   | 2   | 169  | 169   |
| 11:00 AM                   | 185   | 2   | 187  | 187   |
| 11:15 AM                   | 189   | 4   | 193  | 193   |
| 11:30 AM                   | 162   | 5   | 167  | 167   |
| 11:45 AM                   | 158   | 5   | 163  | 163   |
| 12:00 PM                   | 148   | 7   | 155  | 155   |
| 12:15 PM                   | 137   | 6   | 143  | 143   |
| 12:30 PM                   | 143   | 5   | 148  | 148   |
| 12:45 PM                   | 153   | 4   | 157  | 157   |
| 1:00 PM                    | 166   | 4   | 170  | 170   |
| 1:15 PM                    | 184   | 4   | 188  | 188   |
| 1:30 PM                    | 203   | 6   | 209  | 209   |
| 1:45 PM                    | 238   | 8   | 246  | 246   |
| 2:00 PM                    | 254   | 10  | 264  | 264   |
| 2:15 PM                    | 270   | 18  | 288  | 288   |
| 2:30 PM                    | 252   | 19  | 271  | 271   |
| 2:45 PM                    | 210   | 17  | 227  | 227   |
| 3:00 PM                    | 195   | 15  | 210  | 210   |
| 3:15 PM                    | 170   | 8   | 178  | 178   |
| 3:30 PM                    | 173   | 6   | 179  | 179   |
| 3:45 PM                    | 195   | 7   | 192  | 192   |
| 4:00 PM                    | 166   | 4   | 170  | 170   |
| 4:15 PM                    | 161   | 2   | 163  | 163   |
| 4:30 PM                    | 167   | 2   | 169  | 169   |
| 4:45 PM                    | 154   | 4   | 158  | 158   |
| 5:00 PM                    | 146   | 4   | 150  | 150   |
| 5:15 PM                    | 138   | 4   | 142  | 142   |
| 5:30 PM                    | 121   | 4   | 125  | 125   |
| 5:45 PM                    | 105   | 0   | 105  | 105   |
| 6:00 PM                    | 117   | 0   | 117  | 117   |
| 6:15 PM                    | 90  | 0   | 90   | 90  |
| 6:30 PM                    | 64  | 0   | 64   | 64  |
| 6:45 PM                    | 38  | 0   | 38   | 38  |
| 7:00 PM                    | 0   | 0   | 0  | 0   |
| 7:15 PM                    | 0   | 0   | 0  | 0   |
| 7:30 PM                    | 0   | 0   | 0  | 0   |
| 7:45 PM                    | 0   | 0   | 0  | 0   |
| 8:00 PM                    | 0   | 0   | 0  | 0   |

| Actual Peak Hour Major Traffic Volume | Actual Peak Hour Minor Traffic Volume | Required Peak Hour Minor Traffic Volume for Fig. 4C-3 | Required Peak Hour Minor Traffic Volume for Fig. 4C-4 |
|---------------------------------------|---------------------------------------|---|---|
| 289                                   | 18                                    | 546   | 326   |

## OMUTCD WARRANT 4, PEDESTRIAN VOLUME

| Hour Interval<br>Beginning At | Major Street<br>Combined<br>Vehicles Per<br>Hour (VPH) | Total of All<br>Pedestrians<br>Crossing Major<br>Street<br>Pedestrians Per<br>Hour (PPH) |
|-------------------------------|--|--|
| 6:00 AM                       | 0  | 0  |
| 6:15 AM                       | 23   | 5  |
| 6:30 AM                       | 62   | 5  |
| 6:45 AM                       | 116  | 8  |
| 7:00 AM                       | 183  | 15   |
| 7:15 AM                       | 212  | 13   |
| 7:30 AM                       | 253  | 23   |
| 7:45 AM                       | 289  | 22   |
| 8:00 AM                       | 264  | 16   |
| 8:15 AM                       | 242  | 16   |
| 8:30 AM                       | 189  | 11   |
| 8:45 AM                       | 127  | 10   |
| 9:00 AM                       | 115  | 9  |
| 9:15 AM                       | 115  | 8  |
| 9:30 AM                       | 105  | 3  |
| 9:45 AM                       | 110  | 3  |
| 10:00 AM                      | 111  | 6  |
| 10:15 AM                      | 119  | 15   |
| 10:30 AM                      | 156  | 17   |
| 10:45 AM                      | 167  | 17   |
| 11:00 AM                      | 185  | 18   |
| 11:15 AM                      | 189  | 9  |
| 11:30 AM                      | 162  | 8  |
| 11:45 AM                      | 158  | 7  |
| 12:00 PM                      | 148  | 6  |
| 12:15 PM                      | 137  | 5  |
| 12:30 PM                      | 143  | 5  |
| 12:45 PM                      | 153  | 6  |
| 1:00 PM                       | 166  | 7  |
| 1:15 PM                       | 184  | 11   |
| 1:30 PM                       | 203  | 13   |
| 1:45 PM                       | 238  | 64   |
| 2:00 PM                       | 254  | 71   |
| 2:15 PM                       | 270  | 93   |
| 2:30 PM                       | 252  | 94   |
| 2:45 PM                       | 210  | 49   |
| 3:00 PM                       | 195  | 40   |
| 3:15 PM                       | 170  | 14   |
| 3:30 PM                       | 173  | 11   |
| 3:45 PM                       | 185  | 4  |
| 4:00 PM                       | 166  | 4  |
| 4:15 PM                       | 161  | 5  |
| 4:30 PM                       | 167  | 4  |
| 4:45 PM                       | 154  | 8  |
| 5:00 PM                       | 146  | 7  |
| 5:15 PM                       | 138  | 7  |
| 5:30 PM                       | 121  | 9  |
| 5:45 PM                       | 105  | 6  |
| 6:00 PM                       | 117  | 6  |
| 6:15 PM                       | 90   | 4  |
| 6:30 PM                       | 64   | 2  |
| 6:45 PM                       | 38   | 1  |
| 7:00 PM                       | 0  | 0  |
| 7:15 PM                       | 0  | 0  |
| 7:30 PM                       | 0  | 0  |
| 7:45 PM                       | 0  | 0  |
| 8:00 PM                       | 0  | 0  |

**Built-up Isolated Community With Less Than 10,000 Population  
or Above 35 MPH on Major Street?** No

**15th Percentile Pedestrian Crossing Speed Less than 3.5 ft/s?\*** No  
*\*If applicable, attach all supporting calculations, documentation, and findings.*

If 15th Percentile Pedestrian Crossing Speed is Less than 3.5 ft/s,  
Reduce Criterion by (up to 50%):  

**Is the distance to the nearest traffic control signal or STOP sign  
controlling the major street that pedestrians desire to cross  
less than 300 feet?** No

If the distance to the nearest traffic control signal or STOP sign controlling  
the major street that pedestrians desire to cross is less than 300 feet, will the  
proposed traffic control signal restrict the progressive movement of traffic? If  
applicable, attach supporting justification.  

**Does the intersection meet the 4-Hour Volume?** No

**Does the intersection meet the Peak Hour?** No

**Are the Requirements for Warrant 4 Satisfied?** No

| Top Hours for Figure 4C-5 | Start Time | End Time | Vehicles | Pedestrians |
|---------------------------|------------|----------|----------|-------------|
| Top Hour                  | 2:15 PM    | 3:15 PM  | 270      | 93          |
| 2nd Highest Hour          | 7:45 AM    | 8:45 AM  | 289      | 22          |
| 3rd Highest Hour          | 11:00 AM   | 12:00 PM | 185      | 18          |
| 4th Highest Hour          | 1:15 PM    | 2:15 PM  | 184      | 11          |

| Top Hours for Figure 4C-6 | Start Time | End Time | Vehicles | Pedestrians |
|---------------------------|------------|----------|----------|-------------|
| Top Hour                  | 2:15 PM    | 3:15 PM  | 270      | 93          |
| 2nd Highest Hour          | 7:45 AM    | 8:45 AM  | 289      | 22          |
| 3rd Highest Hour          | 11:00 AM   | 12:00 PM | 185      | 18          |
| 4th Highest Hour          | 1:15 PM    | 2:15 PM  | 184      | 11          |

Peak Hour Used for Graphs 4C-7 & 4C-8

Top Hour

| Start Time | End Time | Vehicles | Pedestrians |
|------------|----------|----------|-------------|
| 2:15 PM    | 3:15 PM  | 270      | 93          |

Number of Hours That Met the 4-Hour  
Criteria 4C-5 0

Number of Hours That Met the 4-Hour  
Criteria 4C-6 0

Figure 4C-5. Warrant 4, Pedestrians Four-Hour Volume

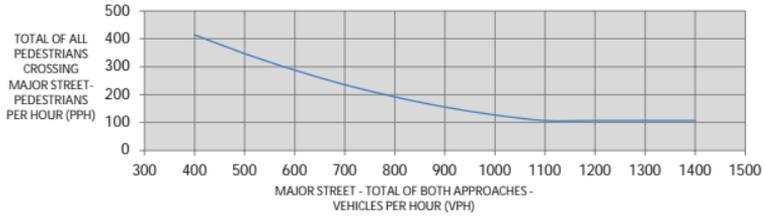


Figure 4C-6. Warrant 4, Pedestrian Four Hour Volume (70% Factor)

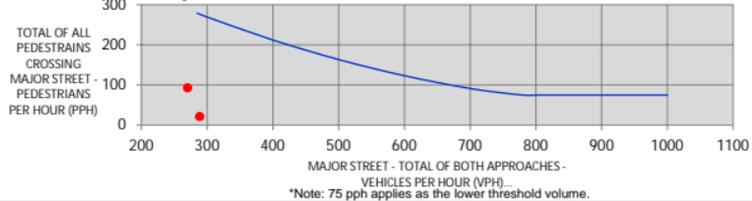


Figure 4C-7. Warrant 4, Pedestrian Peak Hour

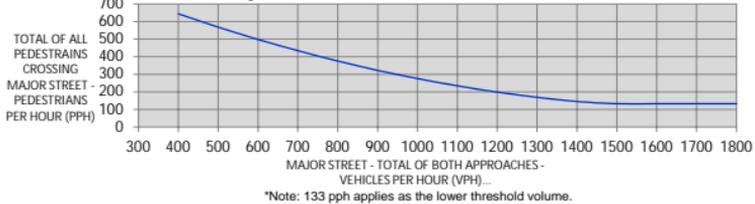
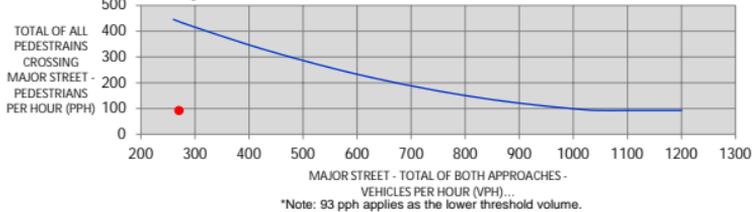


Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



## STUDY AND ANALYSIS INFORMATION

|                                   |                     |  |                         |
|-----------------------------------|---------------------|--|-------------------------|
| <b>Municipality:</b>              | Stubenville         | <b>Traffic Volumes Obtained By:</b>                      | Smart Services          |
| <b>County:</b>                    | Jefferson           | <b>Analysis Date:</b>                                    | 11/6/2024               |
| <b>ODOT Engineering District:</b> | 11                  | <b>Agency/ Company Name Performing Warrant Analysis:</b> | Strand Associates, Inc. |
| <b>Google map link:</b>           | <a href="#">Map</a> |  |                         |

### Analysis Information

**Data Collection Date:** 9/12/2024  
**Day of the Week:** Thursday

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Existing Traffic Signal at intersection: Yes

Total Number of Approaches at Intersection: 4

### Major Street Information

Major Street Name and Route Number: 4th St

Major Street Approach Direction: N-Bound  
S-Bound

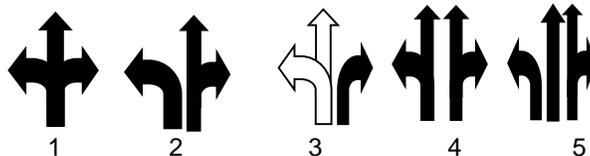
Number of Thru Lanes on Each Major Street Approach: 1 LANE(S)

Speed Limit or 85th Percentile Speed on the Major Street\*: 25 MPH  
\*Unknown assumes below 45 mph

### Minor Street Information

Minor Street Name and Route Number: Logan St

Minor Street Approach Configuration: 1 E-Bound  
1 W-Bound



Number of Thru Lanes on Each Minor Street Approach: 1 LANE(S)  
 Apply Right Turn Lane Reduction\*: Yes

\*Right Turn Lane Reduction Shall be used for Warrants 1, 2, & 3 for New ODOT Signals. Please refer to TEM 402-3.2 for clarification and criteria under which Right Turn Reduction is not required.

## TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

|  | Warrant     |            | Notes and Comments:   |                  |         |         |
|--|-------------|------------|---|------------------|---------|---------|
|  | Applicable? | Satisfied? |   |                  |         |         |
| <b>Warrant 1, Eight-Hour Vehicular Volume</b>  | Yes         | No         |   |                  |         |         |
| <b>Warrant 2, Four-Hour Vehicular Volume</b>   | Yes         | No         |   |                  |         |         |
| <b>Warrant 3, Peak Hour</b>  | Yes         | No         | Signals installed under Warrant 3 should be traffic actuated. <table border="1" style="float: right; margin-top: 5px;"> <tr><td style="text-align: center;"><b>Peak Hour</b></td></tr> <tr><td style="text-align: center;">7:30 AM</td></tr> <tr><td style="text-align: center;">8:30 AM</td></tr> </table>   | <b>Peak Hour</b> | 7:30 AM | 8:30 AM |
| <b>Peak Hour</b>   |             |            |   |                  |         |         |
| 7:30 AM  |             |            |   |                  |         |         |
| 8:30 AM  |             |            |   |                  |         |         |
| For Warrants 1-3, new ODOT signals must be based off of 100% volume thresholds (TEM 402-3.2) |             |            |   |                  |         |         |
| <b>Warrant 4, Pedestrian Volume</b>  | Yes         | No         | If this warrant is met, and a traffic control signal is justified by an engineering study, the traffic control signal shall be equipped with pedestrian signal heads complying with the provisions set forth in Chapter 4E of the OMUTCD. <table border="1" style="float: right; margin-top: 5px;"> <tr><td style="text-align: center;"><b>Peak Hour</b></td></tr> <tr><td style="text-align: center;">2:15 PM</td></tr> <tr><td style="text-align: center;">3:15 PM</td></tr> </table> | <b>Peak Hour</b> | 2:15 PM | 3:15 PM |
| <b>Peak Hour</b>   |             |            |   |                  |         |         |
| 2:15 PM  |             |            |   |                  |         |         |
| 3:15 PM  |             |            |   |                  |         |         |
| <b>Warrant 5, School Crossing</b>  | No          |            | N/A   |                  |         |         |
| <b>Warrant 6, Coordinated Signal System</b>  | No          |            | (Shall not be used as the sole warrant in the analysis)   |                  |         |         |
| <b>Warrant 7, Crash Experience</b>   | No          |            | If this is the sole warrant, signal must be semi-actuated with control devices which provide proper coordination if installed at an intersection within a coordinated system and normally should be fully traffic actuated if installed at an isolated intersection.  |                  |         |         |
| <b>Warrant 8, Roadway Network</b>  | No          |            | (Shall not be used as the sole warrant in the analysis)   |                  |         |         |
| <b>Warrant 9, Intersection Near a Grade Crossing</b>   | No          |            | Figure 4C-9   |                  |         |         |
| <b>Multi-Way Stop Warrant</b>  | Yes         | Yes        | May be used as an interim measure if traffic signal warrants are satisfied.   |                  |         |         |

**The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.**

If no warrants are satisfied, additional options may be considered:

1. An engineering study, performed by a firm prequalified by ODOT for signal design, if approved by the ODOT district, may be used to justify a new signal installation or retention of an existing signal that otherwise does not meet the published warrants. An example of such an instance is a traffic signal in proximity to a railroad crossing that serves to reduce queuing across the tracks.
2. According to TEM 402-2, If the actual turning movement counts fail to satisfy a signal warrant, it may be acceptable to use traffic volumes projected to the second year after project completion. The **Modeling and Forecasting Section** should provide the projected traffic volumes.
3. A pedestrian hybrid beacon may be considered for installation to facilitate pedestrian crossings at a location that does not meet traffic signal warrants (see Chapter 4C of TEM) or at a location that meets traffic signal warrants under Sections 4C.05 and/or 4C.06 but a decision is made to not install a traffic control signal. **Please fill inputs on PHB Score Sheet and submit to ODOT.**

Considerations such as geometrics and lack of sight distance generally have not been accepted in lieu of satisfying signal warrants. These considerations may allow an otherwise unwarranted traffic signal to be retained at **100 percent** local cost. Please review TEM 402-4 for details.

Conclusion: **Do Not Retain Existing Traffic Signal**

Notes:

## OMUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

**Number of Lanes for Moving Traffic on Each Approach**

|                      |        |
|----------------------|--------|
| <b>Major Street:</b> | 1 Lane |
| <b>Minor Street:</b> | 1 Lane |

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? No

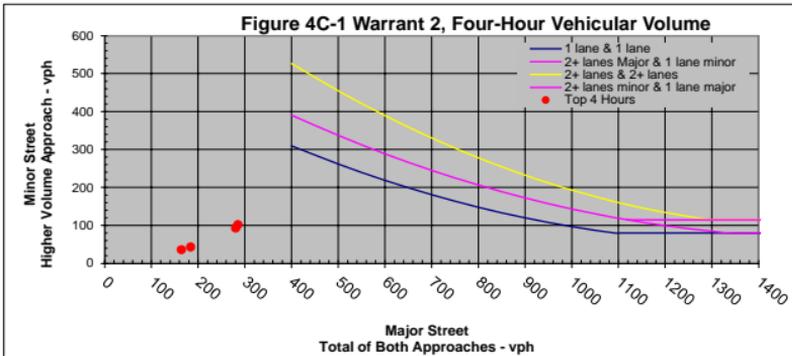
*\*Only applicable after an adequate trial of other alternatives (See section 4C.02.06 of the 2012 OMUTCD)*

| Lanes Major/Minor | Adjusted Volumes |       | Condition A |      |      |      | Condition B |      |      |      | Combination A/B* |      |      |      |      |      |      |      |
|-------------------|------------------|-------|-------------|------|------|------|-------------|------|------|------|------------------|------|------|------|------|------|------|------|
|                   | Major            | Minor | 100%        |      | 70%  |      | 100%        |      | 70%  |      | 80%              |      | 80%  |      | 56%  |      | 56%  |      |
|                   |                  |       | Maj.        | Min. | Maj. | Min. | Maj.        | Min. | Maj. | Min. | Maj.             | Min. | Maj. | Min. | Maj. | Min. | Maj. | Min. |
| 1 / 1             | X                |       | 500         | 150  | 350  | 105  | 750         | 75   | 525  | 53   | 400              | 120  | 600  | 60   | 280  | 84   | 420  | 42   |
| 2+ / 1            |                  |       | 600         | 150  | 420  | 105  | 900         | 75   | 630  | 53   | 480              | 120  | 720  | 60   | 336  | 84   | 504  | 42   |
| 2+ / 2+           |                  |       | 600         | 200  | 420  | 140  | 900         | 100  | 630  | 70   | 480              | 160  | 720  | 80   | 336  | 112  | 504  | 56   |
| 1 / 2+            |                  |       | 500         | 200  | 350  | 140  | 750         | 100  | 525  | 70   | 400              | 160  | 600  | 80   | 280  | 112  | 420  | 56   |
| 12:00 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:15 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:30 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:45 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:15 AM           | 20               | 11    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:30 AM           | 59               | 46    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:45 AM           | 137              | 80    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:00 AM           | 201              | 124   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:15 AM           | 243              | 124   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:30 AM           | 285              | 102   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:45 AM           | 274              | 87    |             |      |      |      |             |      |      |      |                  |      |      |      | 1    | 1    |      |      |
| 8:00 AM           | 263              | 42    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:15 AM           | 224              | 41    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:30 AM           | 164              | 36    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:45 AM           | 130              | 26    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:00 AM           | 103              | 24    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:15 AM           | 104              | 21    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:30 AM           | 96               | 17    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:45 AM           | 99               | 16    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:00 AM          | 110              | 19    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:15 AM          | 135              | 25    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |



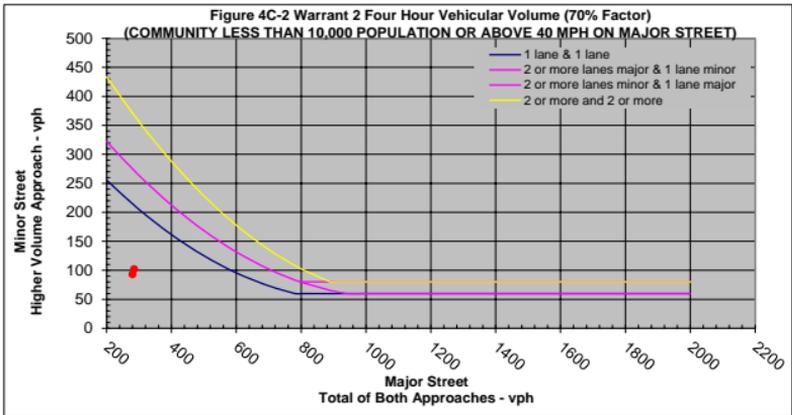
## OMUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

| Number of Lanes for Moving Traffic on Each Approach   |                    | Total Number of Unique Hours Met on Figure 4C-1              |                  |         |                              | 0  |           |                        |
|---|--------------------|--|------------------|---------|------------------------------|--|-----------|------------------------|
| Major street: 1 Lane  |                    | Total Number of Unique Hours Met on Figure 4C-2 (70% Factor) |                  |         |                              | 0  |           |                        |
| Minor Street: 1 Lane  |                    |  |                  |         |                              |  |           |                        |
| Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? |                    |  |                  |         |                              |  |           |                        |
| No  |                    |  |                  |         |                              |  |           |                        |
| Hour Interval Beginning At  | Raw Traffic Counts |  |                  |         | Total Major Approach Volumes | Highest Actual Minor Street Approach Volumes | Hour Met? | Hour Met? (70% Factor) |
|   | Major - 4th St     |  | Minor - Logan St |         |                              |  |           |                        |
|   | N-Bound            | S-Bound  | W-Bound          | E-Bound |                              |  |           |                        |
| 6:00 AM   | 0                  | 0  | 0                | 0       | 0                            | 0  |           |                        |
| 6:15 AM   | 12                 | 8  | 7                | 11      | 20                           | 11   |           |                        |
| 6:30 AM   | 32                 | 27   | 14               | 46      | 59                           | 46   |           |                        |
| 6:45 AM   | 75                 | 62   | 27               | 80      | 137                          | 80   |           |                        |
| 7:00 AM   | 110                | 91   | 43               | 124     | 201                          | 124  |           |                        |
| 7:15 AM   | 141                | 102  | 43               | 124     | 243                          | 124  |           |                        |
| 7:30 AM   | 184                | 101  | 44               | 102     | 285                          | 102  |           |                        |
| 7:45 AM   | 187                | 87   | 37               | 87      | 274                          | 87   |           |                        |
| 8:00 AM   | 185                | 78   | 22               | 42      | 263                          | 42   |           |                        |
| 8:15 AM   | 155                | 69   | 21               | 41      | 224                          | 41   |           |                        |
| 8:30 AM   | 104                | 60   | 14               | 36      | 164                          | 36   |           |                        |
| 8:45 AM   | 75                 | 55   | 12               | 26      | 130                          | 26   |           |                        |
| 9:00 AM   | 53                 | 50   | 14               | 24      | 103                          | 24   |           |                        |
| 9:15 AM   | 54                 | 50   | 9                | 21      | 104                          | 21   |           |                        |
| 9:30 AM   | 49                 | 47   | 9                | 17      | 96                           | 17   |           |                        |
| 9:45 AM   | 53                 | 46   | 8                | 16      | 99                           | 16   |           |                        |
| 10:00 AM  | 56                 | 54   | 5                | 19      | 110                          | 19   |           |                        |
| 10:15 AM  | 70                 | 65   | 12               | 25      | 135                          | 25   |           |                        |
| 10:30 AM  | 84                 | 84   | 14               | 30      | 168                          | 30   |           |                        |
| 10:45 AM  | 90                 | 95   | 16               | 34      | 185                          | 34   |           |                        |
| 11:00 AM  | 97                 | 87   | 16               | 43      | 184                          | 43   |           |                        |
| 11:15 AM  | 91                 | 85   | 15               | 41      | 176                          | 41   |           |                        |
| 11:30 AM  | 84                 | 69   | 14               | 39      | 153                          | 39   |           |                        |
| 11:45 AM  | 75                 | 67   | 12               | 39      | 142                          | 39   |           |                        |
| 12:00 PM  | 72                 | 67   | 10               | 33      | 139                          | 33   |           |                        |
| 12:15 PM  | 65                 | 58   | 9                | 31      | 123                          | 31   |           |                        |
| 12:30 PM  | 74                 | 67   | 9                | 29      | 141                          | 29   |           |                        |
| 12:45 PM  | 73                 | 70   | 12               | 27      | 143                          | 27   |           |                        |
| 1:00 PM   | 79                 | 68   | 15               | 31      | 147                          | 31   |           |                        |
| 1:15 PM   | 87                 | 81   | 13               | 32      | 168                          | 32   |           |                        |
| 1:30 PM   | 89                 | 94   | 16               | 46      | 183                          | 46   |           |                        |
| 1:45 PM   | 112                | 115  | 21               | 74      | 227                          | 74   |           |                        |
| 2:00 PM   | 131                | 134  | 31               | 84      | 265                          | 84   |           |                        |
| 2:15 PM   | 143                | 137  | 30               | 93      | 280                          | 93   |           |                        |
| 2:30 PM   | 131                | 129  | 30               | 75      | 260                          | 75   |           |                        |
| 2:45 PM   | 121                | 94   | 29               | 46      | 215                          | 46   |           |                        |
| 3:00 PM   | 99                 | 85   | 21               | 32      | 184                          | 32   |           |                        |
| 3:15 PM   | 82                 | 67   | 21               | 27      | 149                          | 27   |           |                        |
| 3:30 PM   | 87                 | 59   | 20               | 30      | 146                          | 30   |           |                        |
| 3:45 PM   | 78                 | 61   | 14               | 29      | 139                          | 29   |           |                        |
| 4:00 PM   | 72                 | 55   | 10               | 27      | 127                          | 27   |           |                        |
| 4:15 PM   | 69                 | 62   | 7                | 23      | 131                          | 23   |           |                        |
| 4:30 PM   | 63                 | 59   | 4                | 19      | 122                          | 19   |           |                        |
| 4:45 PM   | 53                 | 56   | 3                | 15      | 109                          | 15   |           |                        |
| 5:00 PM   | 55                 | 47   | 4                | 8       | 102                          | 8  |           |                        |
| 5:15 PM   | 51                 | 45   | 5                | 13      | 96                           | 13   |           |                        |
| 5:30 PM   | 55                 | 43   | 6                | 14      | 98                           | 14   |           |                        |
| 5:45 PM   | 57                 | 43   | 7                | 14      | 100                          | 14   |           |                        |
| 6:00 PM   | 54                 | 49   | 7                | 16      | 103                          | 16   |           |                        |
| 6:15 PM   | 43                 | 36   | 5                | 9       | 79                           | 9  |           |                        |
| 6:30 PM   | 27                 | 26   | 4                | 5       | 53                           | 5  |           |                        |
| 6:45 PM   | 14                 | 14   | 1                | 2       | 28                           | 2  |           |                        |
| 7:00 PM   | 0                  | 0  | 0                | 0       | 0                            | 0  |           |                        |
| 7:15 PM   | 0                  | 0  | 0                | 0       | 0                            | 0  |           |                        |
| 7:30 PM   | 0                  | 0  | 0                | 0       | 0                            | 0  |           |                        |
| 7:45 PM   | 0                  | 0  | 0                | 0       | 0                            | 0  |           |                        |
| 8:00 PM   | 0                  | 0  | 0                | 0       | 0                            | 0  |           |                        |



| Top Hours for Figure 4C-1 |          | Start Time | End Time | Major Street | Minor Street |
|---------------------------|----------|------------|----------|--------------|--------------|
| Top Hour                  | 7:30 AM  | 8:30 AM    | 285      | 102          |              |
| 2nd Highest Hour          | 2:15 PM  | 3:15 PM    | 280      | 93           |              |
| 3rd Highest Hour          | 11:00 AM | 12:00 PM   | 184      | 43           |              |
| 4th Highest Hour          | 8:30 AM  | 9:30 AM    | 164      | 36           |              |

| Top Hours for Figure 4C-2 |          | Start Time | End Time | Major Street | Minor Street |
|---------------------------|----------|------------|----------|--------------|--------------|
| Top Hour                  | 7:30 AM  | 8:30 AM    | 285      | 102          |              |
| 2nd Highest Hour          | 2:15 PM  | 3:15 PM    | 280      | 93           |              |
| 3rd Highest Hour          | 11:00 AM | 12:00 PM   | 184      | 43           |              |
| 4th Highest Hour          | 8:30 AM  | 9:30 AM    | 164      | 36           |              |



Are the requirements for Warrant 2 met?:  No

## OMUTCD WARRANT 3, PEAK HOUR

|  |                             |         |
|--|-----------------------------|---------|
| <b>Number of Lanes for Moving Traffic on Each Approach</b> | <b>Peak Hour Start time</b> | 7:30 AM |
| <b>Major Street:</b> 1 Lane                                | <b>Peak Hour End Time</b>   | 8:30 AM |
| <b>Minor Street:</b> 1 Lane                                |                             |         |

**Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street?**

No

Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?

No

**Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present\***

Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?

Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?

Yes

Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?

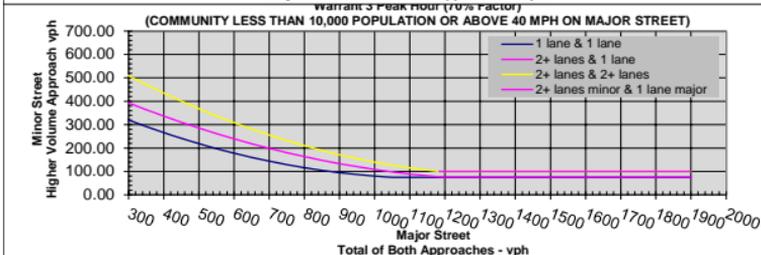
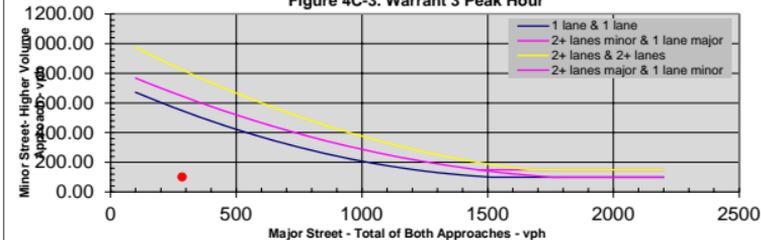
No

*\*If applicable, attach all supporting calculations and documentation.*

**Are the requirements for Warrant 3 met?:**

No

**Figure 4C-3. Warrant 3 Peak Hour**



| Hour Vehicular Volume      |   |   |  |   |
|----------------------------|---|---|--|---|
| Hour Interval Beginning At | Major Street Combined Vehicles Per Hour (VPH) | Highest Minor Street Approach Vehicles Per Hour (VPH) | Sum of Major Street and Highest Minor Street | Sum of Major Street and Combined Minor Street |
| 6:00 AM                    | 0   | 0   | 0  | 0   |
| 6:15 AM                    | 20  | 11  | 31   | 38  |
| 6:30 AM                    | 59  | 46  | 105  | 119   |
| 6:45 AM                    | 137   | 80  | 217  | 244   |
| 7:00 AM                    | 201   | 124   | 325  | 368   |
| 7:15 AM                    | 243   | 124   | 367  | 410   |
| 7:30 AM                    | 285   | 102   | 387  | 431   |
| 7:45 AM                    | 274   | 87  | 361  | 398   |
| 8:00 AM                    | 263   | 42  | 305  | 327   |
| 8:15 AM                    | 224   | 41  | 265  | 286   |
| 8:30 AM                    | 164   | 36  | 200  | 214   |
| 8:45 AM                    | 130   | 26  | 156  | 168   |
| 9:00 AM                    | 103   | 24  | 127  | 141   |
| 9:15 AM                    | 104   | 21  | 125  | 134   |
| 9:30 AM                    | 96  | 17  | 113  | 122   |
| 9:45 AM                    | 99  | 16  | 115  | 123   |
| 10:00 AM                   | 110   | 19  | 129  | 134   |
| 10:15 AM                   | 135   | 25  | 160  | 172   |
| 10:30 AM                   | 168   | 30  | 198  | 212   |
| 10:45 AM                   | 185   | 34  | 219  | 235   |
| 11:00 AM                   | 184   | 43  | 227  | 243   |
| 11:15 AM                   | 176   | 41  | 217  | 232   |
| 11:30 AM                   | 153   | 39  | 192  | 206   |
| 11:45 AM                   | 142   | 39  | 181  | 193   |
| 12:00 PM                   | 139   | 33  | 172  | 182   |
| 12:15 PM                   | 123   | 31  | 154  | 163   |
| 12:30 PM                   | 141   | 29  | 170  | 179   |
| 12:45 PM                   | 143   | 27  | 170  | 182   |
| 1:00 PM                    | 147   | 31  | 178  | 193   |
| 1:15 PM                    | 168   | 32  | 200  | 213   |
| 1:30 PM                    | 183   | 46  | 229  | 245   |
| 1:45 PM                    | 227   | 74  | 301  | 322   |
| 2:00 PM                    | 265   | 84  | 349  | 380   |
| 2:15 PM                    | 280   | 93  | 373  | 403   |
| 2:30 PM                    | 260   | 75  | 335  | 365   |
| 2:45 PM                    | 215   | 46  | 261  | 290   |
| 3:00 PM                    | 184   | 32  | 216  | 237   |
| 3:15 PM                    | 149   | 27  | 176  | 197   |
| 3:30 PM                    | 146   | 30  | 176  | 196   |
| 3:45 PM                    | 139   | 29  | 168  | 182   |
| 4:00 PM                    | 127   | 27  | 154  | 164   |
| 4:15 PM                    | 131   | 23  | 154  | 161   |
| 4:30 PM                    | 122   | 19  | 141  | 145   |
| 4:45 PM                    | 109   | 15  | 124  | 127   |
| 5:00 PM                    | 102   | 8   | 110  | 114   |
| 5:15 PM                    | 96  | 13  | 109  | 114   |
| 5:30 PM                    | 98  | 14  | 112  | 118   |
| 5:45 PM                    | 100   | 14  | 114  | 121   |
| 6:00 PM                    | 103   | 16  | 119  | 126   |
| 6:15 PM                    | 79  | 9   | 88   | 93  |
| 6:30 PM                    | 53  | 6   | 58   | 62  |
| 6:45 PM                    | 28  | 2   | 30   | 31  |
| 7:00 PM                    | 0   | 0   | 0  | 0   |
| 7:15 PM                    | 0   | 0   | 0  | 0   |
| 7:30 PM                    | 0   | 0   | 0  | 0   |
| 7:45 PM                    | 0   | 0   | 0  | 0   |
| 8:00 PM                    | 0   | 0   | 0  | 0   |

| Actual Peak Hour Major Traffic Volume | Actual Peak Hour Minor Traffic Volume | Required Peak Hour Minor Traffic Volume for Fig. 4C-3 | Required Peak Hour Minor Traffic Volume for Fig. 4C-4 |
|---------------------------------------|---------------------------------------|---|---|
| 285                                   | 102                                   | 548   | 328   |

## OMUTCD WARRANT 4, PEDESTRIAN VOLUME

| Hour Interval Beginning At                        | Major Street Combined Vehicles Per Hour (VPH) | Total of All Pedestrians Crossing Major Street Pedestrians Per Hour (PPH) |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
|---|---|---|---|---------------------------|-------------|----------|----------|-------------|----------|---------|---------|-----|-----|------------------|---------|---------|-----|----|------------------|----------|----------|-----|----|------------------|---------|---------|-----|----|---------------------------|------------|----------|----------|-------------|----------|---------|---------|-----|-----|------------------|---------|---------|-----|----|------------------|----------|----------|-----|----|------------------|---------|---------|-----|----|----------|--|--|--|------------|----------|----------|-------------|---------|---------|-----|-----|---|---|---|---|
| 6:00 AM   | 0   | 0   | <b>Built-up Isolated Community With Less Than 10,000 Population or Above 35 MPH on Major Street?</b> <span style="float: right; background-color: #90EE90; padding: 2px;">No</span>   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 6:15 AM   | 20  | 5   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 6:30 AM   | 59  | 31  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 6:45 AM   | 137   | 59  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 7:00 AM   | 201   | 95  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 7:15 AM   | 243   | 96  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 7:30 AM   | 285   | 79  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 7:45 AM   | 274   | 75  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 8:00 AM   | 263   | 45  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 8:15 AM   | 224   | 43  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 8:30 AM   | 164   | 38  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 8:45 AM   | 130   | 18  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 9:00 AM   | 103   | 13  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 9:15 AM   | 104   | 11  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 9:30 AM   | 96  | 8   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 9:45 AM   | 99  | 8   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 10:00 AM  | 110   | 8   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 10:15 AM  | 135   | 8   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 10:30 AM  | 168   | 19  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 10:45 AM  | 185   | 19  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 11:00 AM  | 184   | 28  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 11:15 AM  | 176   | 31  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 11:30 AM  | 153   | 26  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 11:45 AM  | 142   | 24  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 12:00 PM  | 139   | 15  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 12:15 PM  | 123   | 10  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 12:30 PM  | 141   | 3   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 12:45 PM  | 143   | 9   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 1:00 PM   | 147   | 13  | <p><b>15th Percentile Pedestrian Crossing Speed Less than 3.5 f/s?*</b> <span style="float: right; background-color: #90EE90; padding: 2px;">No</span></p> <p><i>*If applicable, attach all supporting calculations, documentation, and findings.</i></p> <p>If 15th Percentile Pedestrian Crossing Speed is Less than 3.5 f/s, Reduce Criterion by (up to 50%): <span style="float: right; background-color: #FFFF00; padding: 2px;"></span></p> <p><b>Is the distance to the nearest traffic control signal or STOP sign controlling the major street that pedestrians desire to cross less than 300 feet?</b> <span style="float: right; background-color: #FFFF00; padding: 2px;"></span></p> <p>If the distance to the nearest traffic control signal or STOP sign controlling the major street that pedestrians desire to cross is less than 300 feet, will the proposed traffic control signal restrict the progressive movement of traffic? If applicable, attach supporting justification. <span style="float: right; background-color: #FFFF00; padding: 2px;"></span></p> <p><b>Does the intersection meet the 4-Hour Volume?</b> <span style="float: right; background-color: #90EE90; padding: 2px;">No</span></p> <p><b>Does the intersection meet the Peak Hour?</b> <span style="float: right; background-color: #90EE90; padding: 2px;">No</span></p> <p><b>Are the Requirements for Warrant 4 Satisfied?</b> <span style="float: right; background-color: #90EE90; padding: 2px;">No</span></p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Top Hours for Figure 4C-5</th> <th>Start Time</th> <th>End Time</th> <th>Vehicles</th> <th>Pedestrians</th> </tr> </thead> <tbody> <tr> <td style="background-color: #ADD8E6;">Top Hour</td> <td>2:15 PM</td> <td>3:15 PM</td> <td>280</td> <td>183</td> </tr> <tr> <td>2nd Highest Hour</td> <td>7:30 AM</td> <td>8:30 AM</td> <td>285</td> <td>79</td> </tr> <tr> <td>3rd Highest Hour</td> <td>11:00 AM</td> <td>12:00 PM</td> <td>184</td> <td>28</td> </tr> <tr> <td>4th Highest Hour</td> <td>8:30 AM</td> <td>9:30 AM</td> <td>164</td> <td>38</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Top Hours for Figure 4C-6</th> <th>Start Time</th> <th>End Time</th> <th>Vehicles</th> <th>Pedestrians</th> </tr> </thead> <tbody> <tr> <td style="background-color: #ADD8E6;">Top Hour</td> <td>2:15 PM</td> <td>3:15 PM</td> <td>280</td> <td>183</td> </tr> <tr> <td>2nd Highest Hour</td> <td>7:30 AM</td> <td>8:30 AM</td> <td>285</td> <td>79</td> </tr> <tr> <td>3rd Highest Hour</td> <td>11:00 AM</td> <td>12:00 PM</td> <td>184</td> <td>28</td> </tr> <tr> <td>4th Highest Hour</td> <td>8:30 AM</td> <td>9:30 AM</td> <td>164</td> <td>38</td> </tr> </tbody> </table> <div style="border: 1px solid black; padding: 5px; margin-top: 10px; text-align: center;"> <p>Peak Hour Used for Graphs 4C-7 &amp; 4C-8</p> <table border="1" style="width: 100%; border-collapse: collapse; background-color: #ADD8E6;"> <thead> <tr> <th colspan="4">Top Hour</th> </tr> <tr> <th>Start Time</th> <th>End Time</th> <th>Vehicles</th> <th>Pedestrians</th> </tr> </thead> <tbody> <tr> <td>2:15 PM</td> <td>3:15 PM</td> <td>280</td> <td>183</td> </tr> </tbody> </table> </div> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 80%;">Number of Hours That Met the 4-Hour Criteria 4C-5</td> <td style="text-align: center; background-color: #90EE90;">0</td> </tr> <tr> <td>Number of Hours That Met the 4-Hour Criteria 4C-6</td> <td style="text-align: center; background-color: #90EE90;">0</td> </tr> </table> | Top Hours for Figure 4C-5 | Start Time  | End Time | Vehicles | Pedestrians | Top Hour | 2:15 PM | 3:15 PM | 280 | 183 | 2nd Highest Hour | 7:30 AM | 8:30 AM | 285 | 79 | 3rd Highest Hour | 11:00 AM | 12:00 PM | 184 | 28 | 4th Highest Hour | 8:30 AM | 9:30 AM | 164 | 38 | Top Hours for Figure 4C-6 | Start Time | End Time | Vehicles | Pedestrians | Top Hour | 2:15 PM | 3:15 PM | 280 | 183 | 2nd Highest Hour | 7:30 AM | 8:30 AM | 285 | 79 | 3rd Highest Hour | 11:00 AM | 12:00 PM | 184 | 28 | 4th Highest Hour | 8:30 AM | 9:30 AM | 164 | 38 | Top Hour |  |  |  | Start Time | End Time | Vehicles | Pedestrians | 2:15 PM | 3:15 PM | 280 | 183 | Number of Hours That Met the 4-Hour Criteria 4C-5 | 0 | Number of Hours That Met the 4-Hour Criteria 4C-6 | 0 |
| Top Hours for Figure 4C-5                         | Start Time                                    | End Time  |   | Vehicles                  | Pedestrians |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| Top Hour  | 2:15 PM                                       | 3:15 PM   |   | 280                       | 183         |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 2nd Highest Hour                                  | 7:30 AM                                       | 8:30 AM   |   | 285                       | 79          |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 3rd Highest Hour                                  | 11:00 AM                                      | 12:00 PM  |   | 184                       | 28          |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 4th Highest Hour                                  | 8:30 AM                                       | 9:30 AM   |   | 164                       | 38          |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| Top Hours for Figure 4C-6                         | Start Time                                    | End Time  |   | Vehicles                  | Pedestrians |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| Top Hour  | 2:15 PM                                       | 3:15 PM   |   | 280                       | 183         |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 2nd Highest Hour                                  | 7:30 AM                                       | 8:30 AM   |   | 285                       | 79          |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 3rd Highest Hour                                  | 11:00 AM                                      | 12:00 PM  |   | 184                       | 28          |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 4th Highest Hour                                  | 8:30 AM                                       | 9:30 AM   |   | 164                       | 38          |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| Top Hour  |   |   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| Start Time  | End Time                                      | Vehicles  |   | Pedestrians               |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 2:15 PM   | 3:15 PM                                       | 280   |   | 183                       |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| Number of Hours That Met the 4-Hour Criteria 4C-5 | 0   |   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| Number of Hours That Met the 4-Hour Criteria 4C-6 | 0   |   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 1:15 PM   | 168   | 15  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 1:30 PM   | 183   | 17  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 1:45 PM   | 227   | 130   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 2:00 PM   | 265   | 169   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 2:15 PM   | 280   | 183   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 2:30 PM   | 260   | 187   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 2:45 PM   | 215   | 66  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 3:00 PM   | 184   | 24  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 3:15 PM   | 149   | 10  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 3:30 PM   | 146   | 8   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 3:45 PM   | 139   | 14  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 4:00 PM   | 127   | 12  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 4:15 PM   | 131   | 13  |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 4:30 PM   | 122   | 9   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 4:45 PM   | 109   | 3   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 5:00 PM   | 102   | 4   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 5:15 PM   | 96  | 1   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 5:30 PM   | 98  | 1   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 5:45 PM   | 100   | 2   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 6:00 PM   | 103   | 1   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 6:15 PM   | 79  | 1   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 6:30 PM   | 53  | 1   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 6:45 PM   | 28  | 0   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 7:00 PM   | 0   | 0   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 7:15 PM   | 0   | 0   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 7:30 PM   | 0   | 0   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 7:45 PM   | 0   | 0   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |
| 8:00 PM   | 0   | 0   |   |                           |             |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |                           |            |          |          |             |          |         |         |     |     |                  |         |         |     |    |                  |          |          |     |    |                  |         |         |     |    |          |  |  |  |            |          |          |             |         |         |     |     |   |   |   |   |

Figure 4C-5. Warrant 4, Pedestrians Four-Hour Volume

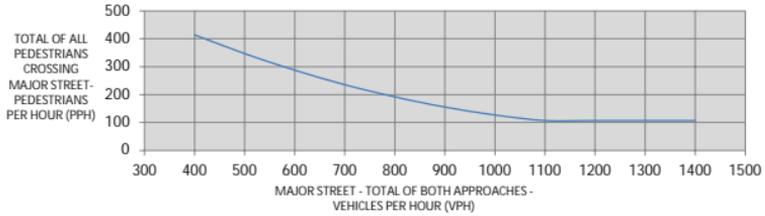


Figure 4C-6. Warrant 4, Pedestrian Four Hour Volume (70% Factor)

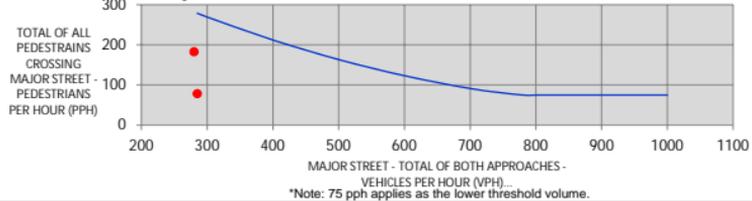


Figure 4C-7. Warrant 4, Pedestrian Peak Hour

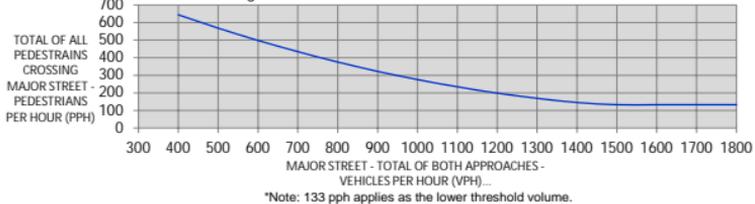
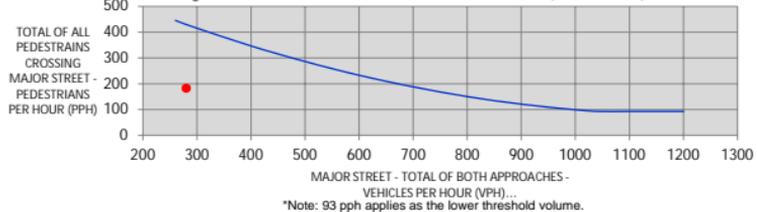


Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



## STUDY AND ANALYSIS INFORMATION

|                                   |                     |  |                         |
|-----------------------------------|---------------------|--|-------------------------|
| <b>Municipality:</b>              | Stubenville         | <b>Traffic Volumes Obtained By:</b>                      | Smart Services          |
| <b>County:</b>                    | Jefferson           | <b>Analysis Date:</b>                                    | 11/6/2024               |
| <b>ODOT Engineering District:</b> | 11                  | <b>Agency/ Company Name Performing Warrant Analysis:</b> | Strand Associates, Inc. |
| <b>Google map link:</b>           | <a href="#">Map</a> |  |                         |

### Analysis Information

**Data Collection Date:** 9/10/2024  
**Day of the Week:** Tuesday

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Existing Traffic Signal at intersection: Yes

Total Number of Approaches at Intersection: 4

### Major Street Information

Major Street Name and Route Number: 3rd St

Major Street Approach Direction: N-Bound  
S-Bound

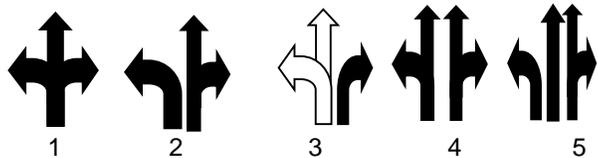
Number of Thru Lanes on Each Major Street Approach: 1 LANE(S)

Speed Limit or 85th Percentile Speed on the Major Street\*: 25 MPH  
\*Unknown assumes below 45 mph

### Minor Street Information

Minor Street Name and Route Number: Market St

Minor Street Approach Configuration: 2 E-Bound  
5 W-Bound



Number of Thru Lanes on Each Minor Street Approach: 1 LANE(S)

Apply Right Turn Lane Reduction\*: Yes

\*Right Turn Lane Reduction Shall be used for Warrants 1, 2, & 3 for New ODOT Signals. Please refer to TEM 402-3.2 for clarification and criteria under which Right Turn Reduction is not required.

## TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

|  | Warrant     |            | Notes and Comments:   |                  |          |         |
|--|-------------|------------|---|------------------|----------|---------|
|  | Applicable? | Satisfied? |   |                  |          |         |
| <b>Warrant 1, Eight-Hour Vehicular Volume</b>  | Yes         | No         |   |                  |          |         |
| <b>Warrant 2, Four-Hour Vehicular Volume</b>   | Yes         | No         |   |                  |          |         |
| <b>Warrant 3, Peak Hour</b>  | Yes         | No         | Signals installed under Warrant 3 should be traffic actuated. <table border="1" style="float: right; margin-top: 5px;"> <tr><td style="text-align: center;"><b>Peak Hour</b></td></tr> <tr><td style="text-align: center;">12:00 PM</td></tr> <tr><td style="text-align: center;">1:00 PM</td></tr> </table>  | <b>Peak Hour</b> | 12:00 PM | 1:00 PM |
| <b>Peak Hour</b>   |             |            |   |                  |          |         |
| 12:00 PM   |             |            |   |                  |          |         |
| 1:00 PM  |             |            |   |                  |          |         |
| For Warrants 1-3, new ODOT signals must be based off of 100% volume thresholds (TEM 402-3.2) |             |            |   |                  |          |         |
| <b>Warrant 4, Pedestrian Volume</b>  | Yes         | No         | If this warrant is met, and a traffic control signal is justified by an engineering study, the traffic control signal shall be equipped with pedestrian signal heads complying with the provisions set forth in Chapter 4E of the OMUTCD. <table border="1" style="float: right; margin-top: 5px;"> <tr><td style="text-align: center;"><b>Peak Hour</b></td></tr> <tr><td style="text-align: center;">2:15 PM</td></tr> <tr><td style="text-align: center;">3:15 PM</td></tr> </table> | <b>Peak Hour</b> | 2:15 PM  | 3:15 PM |
| <b>Peak Hour</b>   |             |            |   |                  |          |         |
| 2:15 PM  |             |            |   |                  |          |         |
| 3:15 PM  |             |            |   |                  |          |         |
| <b>Warrant 5, School Crossing</b>  | No          |            | N/A   |                  |          |         |
| <b>Warrant 6, Coordinated Signal System</b>  | No          |            | (Shall not be used as the sole warrant in the analysis)   |                  |          |         |
| <b>Warrant 7, Crash Experience</b>   | No          |            | If this is the sole warrant, signal must be semi-actuated with control devices which provide proper coordination if installed at an intersection within a coordinated system and normally should be fully traffic actuated if installed at an isolated intersection.  |                  |          |         |
| <b>Warrant 8, Roadway Network</b>  | No          |            | (Shall not be used as the sole warrant in the analysis)   |                  |          |         |
| <b>Warrant 9, Intersection Near a Grade Crossing</b>   | No          |            | Figure 4C-9   |                  |          |         |
| <b>Multi-Way Stop Warrant</b>  | Yes         | Yes        | May be used as an interim measure if traffic signal warrants are satisfied.   |                  |          |         |

**The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.**

If no warrants are satisfied, additional options may be considered:

1. An engineering study, performed by a firm prequalified by ODOT for signal design, if approved by the ODOT district, may be used to justify a new signal installation or retention of an existing signal that otherwise does not meet the published warrants. An example of such an instance is a traffic signal in proximity to a railroad crossing that serves to reduce queuing across the tracks.

2. According to TEM 402-2, If the actual turning movement counts fail to satisfy a signal warrant, it may be acceptable to use traffic volumes projected to the second year after project completion. The **Modeling and Forecasting Section** should provide the projected traffic volumes.

3. A pedestrian hybrid beacon may be considered for installation to facilitate pedestrian crossings at a location that does not meet traffic signal warrants (see Chapter 4C of TEM) or at a location that meets traffic signal warrants under Sections 4C.05 and/or 4C.06 but a decision is made to not install a traffic control signal. **Please fill inputs on PHB Score Sheet and submit to ODOT.**

Considerations such as geometrics and lack of sight distance generally have not been accepted in lieu of satisfying signal warrants. These considerations may allow an otherwise unwarranted traffic signal to be retained at **100 percent** local cost. Please review TEM 402-4 for details.

Conclusion: **Do Not Retain Existing Traffic Signal**

Notes:

## OMUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

**Number of Lanes for Moving Traffic on Each Approach**

**Major Street:** 1 Lane

**Minor Street:** 1 Lane

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? No

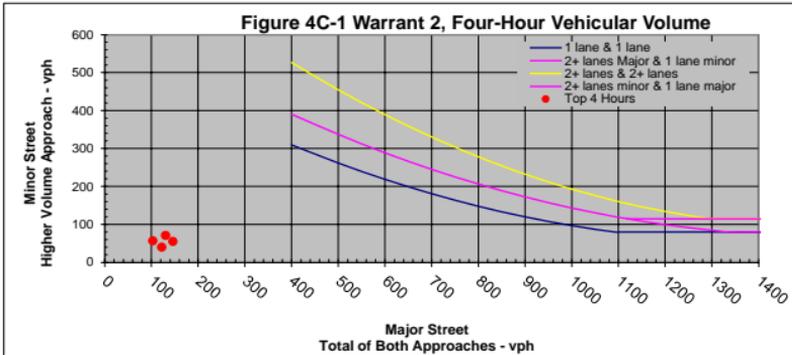
*\*Only applicable after an adequate trial of other alternatives (See section 4C.02.06 of the 2012 OMUTCD)*

| Lanes Major/Minor | Adjusted Volumes |       | Condition A |      |      |      | Condition B |      |      |      | Combination A/B* |      |      |      |      |      |      |      |
|-------------------|------------------|-------|-------------|------|------|------|-------------|------|------|------|------------------|------|------|------|------|------|------|------|
|                   |                  |       | 100%        |      | 70%  |      | 100%        |      | 70%  |      | 80%              |      | 80%  |      | 56%  |      | 56%  |      |
|                   | Major            | Minor | Maj.        | Min. | Maj. | Min. | Maj.        | Min. | Maj. | Min. | Maj.             | Min. | Maj. | Min. | Maj. | Min. | Maj. | Min. |
| 1 / 1             | X                |       | 500         | 150  | 350  | 105  | 750         | 75   | 525  | 53   | 400              | 120  | 600  | 60   | 280  | 84   | 420  | 42   |
| 2+ / 1            |                  |       | 600         | 150  | 420  | 105  | 900         | 75   | 630  | 53   | 480              | 120  | 720  | 60   | 336  | 84   | 504  | 42   |
| 2+ / 2+           |                  |       | 600         | 200  | 420  | 140  | 900         | 100  | 630  | 70   | 480              | 160  | 720  | 80   | 336  | 112  | 504  | 56   |
| 1 / 2+            |                  |       | 500         | 200  | 350  | 140  | 750         | 100  | 525  | 70   | 400              | 160  | 600  | 80   | 280  | 112  | 420  | 56   |
| 12:00 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:15 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:30 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:45 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:15 AM           | 15               | 4     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:30 AM           | 38               | 8     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:45 AM           | 58               | 11    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:00 AM           | 91               | 14    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:15 AM           | 103              | 17    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:30 AM           | 119              | 26    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:45 AM           | 122              | 32    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:00 AM           | 119              | 39    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:15 AM           | 118              | 41    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:30 AM           | 99               | 41    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:45 AM           | 95               | 40    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:00 AM           | 98               | 37    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:15 AM           | 94               | 36    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:30 AM           | 107              | 32    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:45 AM           | 104              | 29    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:00 AM          | 96               | 39    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:15 AM          | 103              | 44    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |



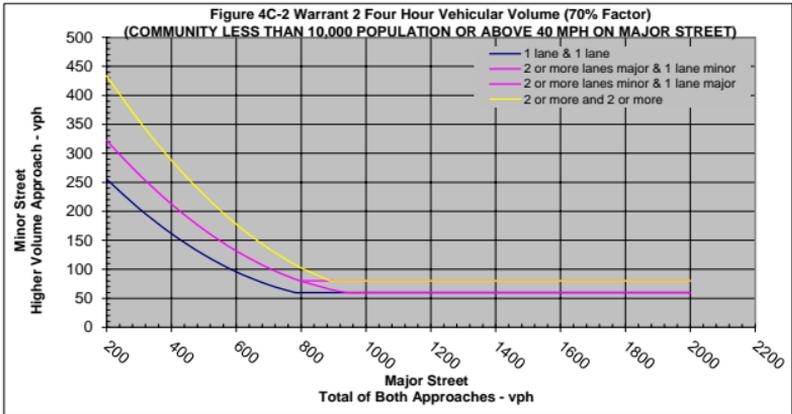
## OMUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

| Number of Lanes for Moving Traffic on Each Approach   |                    | Total Number of Unique Hours Met on Figure 4C-1              |                   |         |                              | 0  |           |                        |
|---|--------------------|--|-------------------|---------|------------------------------|--|-----------|------------------------|
| Major street: 1 Lane  |                    | Total Number of Unique Hours Met on Figure 4C-2 (70% Factor) |                   |         |                              | 0  |           |                        |
| Minor Street: 1 Lane  |                    |  |                   |         |                              |  |           |                        |
| Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? |                    |  |                   |         |                              |  |           |                        |
| No  |                    |  |                   |         |                              |  |           |                        |
| Hour Interval Beginning At  | Raw Traffic Counts |  |                   |         | Total Major Approach Volumes | Highest Actual Minor Street Approach Volumes | Hour Met? | Hour Met? (70% Factor) |
|   | Major - 3rd St     |  | Minor - Market St |         |                              |  |           |                        |
|   | N-Bound            | S-Bound  | W-Bound           | E-Bound |                              |  |           |                        |
| 6:00 AM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |
| 6:15 AM   | 5                  | 10   | 0                 | 4       | 15                           | 4  |           |                        |
| 6:30 AM   | 13                 | 25   | 0                 | 8       | 38                           | 8  |           |                        |
| 6:45 AM   | 22                 | 36   | 3                 | 11      | 58                           | 11   |           |                        |
| 7:00 AM   | 35                 | 56   | 3                 | 14      | 91                           | 14   |           |                        |
| 7:15 AM   | 42                 | 61   | 6                 | 17      | 103                          | 17   |           |                        |
| 7:30 AM   | 40                 | 79   | 6                 | 26      | 119                          | 26   |           |                        |
| 7:45 AM   | 39                 | 83   | 7                 | 32      | 122                          | 32   |           |                        |
| 8:00 AM   | 34                 | 85   | 9                 | 39      | 119                          | 39   |           |                        |
| 8:15 AM   | 34                 | 84   | 10                | 41      | 118                          | 41   |           |                        |
| 8:30 AM   | 39                 | 80   | 10                | 41      | 99                           | 41   |           |                        |
| 8:45 AM   | 37                 | 58   | 9                 | 40      | 95                           | 40   |           |                        |
| 9:00 AM   | 40                 | 58   | 13                | 37      | 98                           | 37   |           |                        |
| 9:15 AM   | 35                 | 59   | 10                | 36      | 94                           | 36   |           |                        |
| 9:30 AM   | 37                 | 70   | 15                | 32      | 107                          | 32   |           |                        |
| 9:45 AM   | 38                 | 66   | 15                | 29      | 104                          | 29   |           |                        |
| 10:00 AM  | 35                 | 61   | 13                | 39      | 96                           | 39   |           |                        |
| 10:15 AM  | 41                 | 62   | 14                | 44      | 103                          | 44   |           |                        |
| 10:30 AM  | 38                 | 55   | 12                | 43      | 93                           | 43   |           |                        |
| 10:45 AM  | 43                 | 59   | 10                | 52      | 101                          | 52   |           |                        |
| 11:00 AM  | 48                 | 55   | 10                | 52      | 103                          | 52   |           |                        |
| 11:15 AM  | 45                 | 59   | 10                | 67      | 104                          | 67   |           |                        |
| 11:30 AM  | 55                 | 61   | 13                | 73      | 116                          | 73   |           |                        |
| 11:45 AM  | 55                 | 67   | 18                | 73      | 122                          | 73   |           |                        |
| 12:00 PM  | 58                 | 72   | 20                | 71      | 130                          | 71   |           |                        |
| 12:15 PM  | 56                 | 75   | 19                | 51      | 131                          | 51   |           |                        |
| 12:30 PM  | 49                 | 77   | 17                | 48      | 126                          | 48   |           |                        |
| 12:45 PM  | 48                 | 76   | 15                | 44      | 124                          | 44   |           |                        |
| 1:00 PM   | 45                 | 74   | 16                | 38      | 119                          | 38   |           |                        |
| 1:15 PM   | 50                 | 64   | 16                | 42      | 114                          | 42   |           |                        |
| 1:30 PM   | 52                 | 70   | 14                | 40      | 122                          | 40   |           |                        |
| 1:45 PM   | 59                 | 69   | 14                | 44      | 128                          | 44   |           |                        |
| 2:00 PM   | 61                 | 75   | 13                | 54      | 136                          | 54   |           |                        |
| 2:15 PM   | 66                 | 85   | 14                | 50      | 151                          | 50   |           |                        |
| 2:30 PM   | 65                 | 81   | 14                | 55      | 146                          | 55   |           |                        |
| 2:45 PM   | 56                 | 80   | 12                | 50      | 136                          | 50   |           |                        |
| 3:00 PM   | 53                 | 69   | 9                 | 39      | 122                          | 39   |           |                        |
| 3:15 PM   | 59                 | 52   | 9                 | 53      | 111                          | 53   |           |                        |
| 3:30 PM   | 52                 | 47   | 12                | 52      | 99                           | 52   |           |                        |
| 3:45 PM   | 55                 | 48   | 15                | 57      | 103                          | 57   |           |                        |
| 4:00 PM   | 54                 | 41   | 20                | 55      | 95                           | 55   |           |                        |
| 4:15 PM   | 36                 | 41   | 19                | 44      | 77                           | 44   |           |                        |
| 4:30 PM   | 40                 | 41   | 18                | 40      | 81                           | 40   |           |                        |
| 4:45 PM   | 37                 | 41   | 18                | 30      | 78                           | 30   |           |                        |
| 5:00 PM   | 32                 | 41   | 14                | 30      | 73                           | 30   |           |                        |
| 5:15 PM   | 36                 | 41   | 16                | 23      | 77                           | 23   |           |                        |
| 5:30 PM   | 29                 | 30   | 13                | 19      | 59                           | 19   |           |                        |
| 5:45 PM   | 27                 | 22   | 8                 | 17      | 49                           | 17   |           |                        |
| 6:00 PM   | 27                 | 25   | 5                 | 17      | 52                           | 17   |           |                        |
| 6:15 PM   | 17                 | 19   | 2                 | 15      | 36                           | 15   |           |                        |
| 6:30 PM   | 13                 | 16   | 1                 | 12      | 29                           | 12   |           |                        |
| 6:45 PM   | 8                  | 8  | 1                 | 8       | 14                           | 8  |           |                        |
| 7:00 PM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |
| 7:15 PM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |
| 7:30 PM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |
| 7:45 PM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |
| 8:00 PM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |



| Top Hours for Figure 4C-1 |            |          |              |              |
|---------------------------|------------|----------|--------------|--------------|
|                           | Start Time | End Time | Major Street | Minor Street |
| Top Hour                  | 12:00 PM   | 1:00 PM  | 130          | 71           |
| 2nd Highest Hour          | 2:30 PM    | 3:30 PM  | 146          | 55           |
| 3rd Highest Hour          | 3:45 PM    | 4:45 PM  | 103          | 57           |
| 4th Highest Hour          | 1:30 PM    | 2:30 PM  | 122          | 40           |

| Top Hours for Figure 4C-2 |            |          |              |              |
|---------------------------|------------|----------|--------------|--------------|
|                           | Start Time | End Time | Major Street | Minor Street |
| Top Hour                  | 12:00 PM   | 1:00 PM  | 130          | 71           |
| 2nd Highest Hour          | 2:30 PM    | 3:30 PM  | 146          | 55           |
| 3rd Highest Hour          | 3:45 PM    | 4:45 PM  | 103          | 57           |
| 4th Highest Hour          | 1:30 PM    | 2:30 PM  | 122          | 40           |



Are the requirements for Warrant 2 met?:

### OMUTCD WARRANT 3, PEAK HOUR

|   |                      |          |
|---|----------------------|----------|
| Number of Lanes for Moving Traffic on Each Approach | Peak Hour Start time | 12:00 PM |
| Major Street: 1 Lane                                | Peak Hour End Time   | 1:00 PM  |
| Minor Street: 1 Lane                                |                      |          |

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street?

No

Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?

No

**Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present\***

Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?

Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?

No

Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?

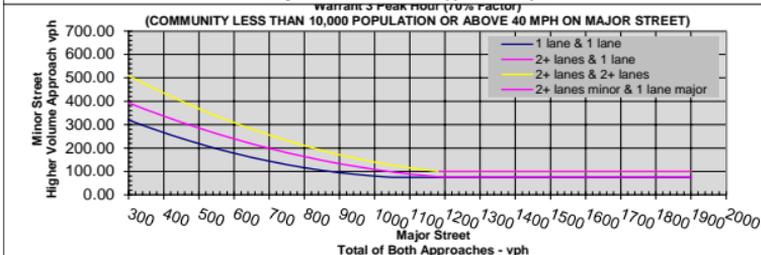
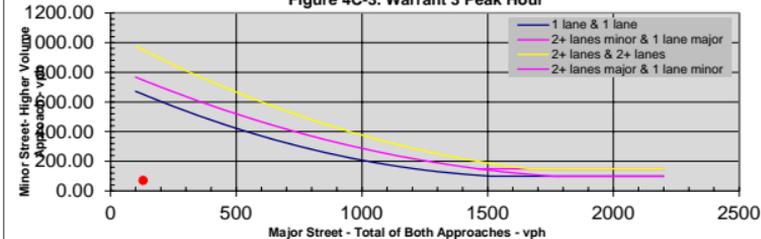
No

\*If applicable, attach all supporting calculations and documentation.

Are the requirements for Warrant 3 met?:

No

**Figure 4C-3. Warrant 3 Peak Hour**



| Hour Vehicular Volume      |   |   |  |   |
|----------------------------|---|---|--|---|
| Hour Interval Beginning At | Major Street Combined Vehicles Per Hour (VPH) | Highest Minor Street Approach Vehicles Per Hour (VPH) | Sum of Major Street and Highest Minor Street | Sum of Major Street and Combined Minor Street |
| 6:00 AM                    | 0   | 0   | 0  | 0   |
| 6:15 AM                    | 15  | 4   | 19   | 19  |
| 6:30 AM                    | 38  | 8   | 46   | 46  |
| 6:45 AM                    | 58  | 11  | 69   | 72  |
| 7:00 AM                    | 91  | 14  | 105  | 108   |
| 7:15 AM                    | 103   | 17  | 120  | 126   |
| 7:30 AM                    | 119   | 26  | 145  | 151   |
| 7:45 AM                    | 122   | 32  | 154  | 161   |
| 8:00 AM                    | 119   | 39  | 158  | 167   |
| 8:15 AM                    | 118   | 41  | 159  | 169   |
| 8:30 AM                    | 99  | 41  | 140  | 150   |
| 8:45 AM                    | 95  | 40  | 135  | 144   |
| 9:00 AM                    | 98  | 37  | 135  | 148   |
| 9:15 AM                    | 94  | 36  | 130  | 140   |
| 9:30 AM                    | 107   | 32  | 139  | 154   |
| 9:45 AM                    | 104   | 29  | 133  | 148   |
| 10:00 AM                   | 96  | 39  | 135  | 148   |
| 10:15 AM                   | 103   | 44  | 147  | 161   |
| 10:30 AM                   | 93  | 43  | 136  | 148   |
| 10:45 AM                   | 101   | 52  | 153  | 163   |
| 11:00 AM                   | 103   | 52  | 155  | 165   |
| 11:15 AM                   | 104   | 67  | 171  | 181   |
| 11:30 AM                   | 116   | 73  | 189  | 202   |
| 11:45 AM                   | 122   | 73  | 195  | 213   |
| 12:00 PM                   | 130   | 71  | 201  | 221   |
| 12:15 PM                   | 131   | 51  | 182  | 201   |
| 12:30 PM                   | 126   | 48  | 174  | 191   |
| 12:45 PM                   | 124   | 44  | 168  | 183   |
| 1:00 PM                    | 119   | 38  | 157  | 173   |
| 1:15 PM                    | 114   | 42  | 156  | 172   |
| 1:30 PM                    | 122   | 40  | 162  | 176   |
| 1:45 PM                    | 128   | 44  | 172  | 186   |
| 2:00 PM                    | 136   | 54  | 190  | 203   |
| 2:15 PM                    | 151   | 50  | 201  | 215   |
| 2:30 PM                    | 146   | 55  | 201  | 215   |
| 2:45 PM                    | 136   | 50  | 186  | 198   |
| 3:00 PM                    | 122   | 39  | 161  | 170   |
| 3:15 PM                    | 111   | 53  | 164  | 173   |
| 3:30 PM                    | 99  | 52  | 151  | 163   |
| 3:45 PM                    | 103   | 57  | 160  | 175   |
| 4:00 PM                    | 95  | 55  | 150  | 170   |
| 4:15 PM                    | 77  | 44  | 121  | 140   |
| 4:30 PM                    | 81  | 40  | 121  | 139   |
| 4:45 PM                    | 78  | 30  | 108  | 126   |
| 5:00 PM                    | 73  | 30  | 103  | 117   |
| 5:15 PM                    | 77  | 23  | 100  | 116   |
| 5:30 PM                    | 59  | 19  | 78   | 91  |
| 5:45 PM                    | 49  | 17  | 66   | 74  |
| 6:00 PM                    | 52  | 17  | 69   | 74  |
| 6:15 PM                    | 36  | 15  | 51   | 53  |
| 6:30 PM                    | 29  | 12  | 41   | 42  |
| 6:45 PM                    | 14  | 8   | 22   | 23  |
| 7:00 PM                    | 0   | 0   | 0  | 0   |
| 7:15 PM                    | 0   | 0   | 0  | 0   |
| 7:30 PM                    | 0   | 0   | 0  | 0   |
| 7:45 PM                    | 0   | 0   | 0  | 0   |
| 8:00 PM                    | 0   | 0   | 0  | 0   |

| Actual Peak Hour Major Traffic Volume | Actual Peak Hour Minor Traffic Volume | Required Peak Hour Minor Traffic Volume for Fig. 4C-3 | Required Peak Hour Minor Traffic Volume for Fig. 4C-4 |
|---------------------------------------|---------------------------------------|---|---|
| 130                                   | 71                                    | 651   | 426   |

## OMUTCD WARRANT 4, PEDESTRIAN VOLUME

| Hour Interval<br>Beginning At | Major Street<br>Combined<br>Vehicles Per<br>Hour (VPH) | Total of All<br>Pedestrians<br>Crossing Major<br>Street<br>Pedestrians Per<br>Hour (PPH) |
|-------------------------------|--|--|
| 6:00 AM                       | 0  | 0  |
| 6:15 AM                       | 15   | 0  |
| 6:30 AM                       | 38   | 0  |
| 6:45 AM                       | 58   | 0  |
| 7:00 AM                       | 91   | 0  |
| 7:15 AM                       | 103  | 0  |
| 7:30 AM                       | 119  | 0  |
| 7:45 AM                       | 122  | 0  |
| 8:00 AM                       | 119  | 0  |
| 8:15 AM                       | 118  | 1  |
| 8:30 AM                       | 99   | 1  |
| 8:45 AM                       | 95   | 7  |
| 9:00 AM                       | 98   | 10   |
| 9:15 AM                       | 94   | 10   |
| 9:30 AM                       | 107  | 13   |
| 9:45 AM                       | 104  | 8  |
| 10:00 AM                      | 96   | 5  |
| 10:15 AM                      | 103  | 4  |
| 10:30 AM                      | 93   | 0  |
| 10:45 AM                      | 101  | 0  |
| 11:00 AM                      | 103  | 5  |
| 11:15 AM                      | 104  | 13   |
| 11:30 AM                      | 116  | 16   |
| 11:45 AM                      | 122  | 26   |
| 12:00 PM                      | 130  | 23   |
| 12:15 PM                      | 131  | 21   |
| 12:30 PM                      | 126  | 20   |
| 12:45 PM                      | 124  | 15   |
| 1:00 PM                       | 119  | 13   |
| 1:15 PM                       | 114  | 10   |
| 1:30 PM                       | 122  | 8  |
| 1:45 PM                       | 128  | 4  |
| 2:00 PM                       | 136  | 8  |
| 2:15 PM                       | 151  | 8  |
| 2:30 PM                       | 146  | 8  |
| 2:45 PM                       | 136  | 8  |
| 3:00 PM                       | 122  | 4  |
| 3:15 PM                       | 111  | 3  |
| 3:30 PM                       | 99   | 4  |
| 3:45 PM                       | 103  | 3  |
| 4:00 PM                       | 95   | 11   |
| 4:15 PM                       | 77   | 11   |
| 4:30 PM                       | 81   | 11   |
| 4:45 PM                       | 78   | 11   |
| 5:00 PM                       | 73   | 3  |
| 5:15 PM                       | 77   | 1  |
| 5:30 PM                       | 59   | 2  |
| 5:45 PM                       | 49   | 3  |
| 6:00 PM                       | 52   | 3  |
| 6:15 PM                       | 36   | 3  |
| 6:30 PM                       | 29   | 1  |
| 6:45 PM                       | 14   | 0  |
| 7:00 PM                       | 0  | 0  |
| 7:15 PM                       | 0  | 0  |
| 7:30 PM                       | 0  | 0  |
| 7:45 PM                       | 0  | 0  |
| 8:00 PM                       | 0  | 0  |

**Built-up Isolated Community With Less Than 10,000 Population or Above 35 MPH on Major Street?**

**15th Percentile Pedestrian Crossing Speed Less than 3.5 f/s?\***   
*\*If applicable, attach all supporting calculations, documentation, and findings.*

If 15th Percentile Pedestrian Crossing Speed is Less than 3.5 f/s,  
 Reduce Criterion by (up to 50%):

**Is the distance to the nearest traffic control signal or STOP sign controlling the major street that pedestrians desire to cross less than 300 feet?**

If the distance to the nearest traffic control signal or STOP sign controlling the major street that pedestrians desire to cross is less than 300 feet, will the proposed traffic control signal restrict the progressive movement of traffic? If applicable, attach supporting justification.

**Does the intersection meet the 4-Hour Volume?**

**Does the intersection meet the Peak Hour?**

**Are the Requirements for Warrant 4 Satisfied?**

| Top Hours for Figure 4C-5 | Start Time | End Time | Vehicles | Pedestrians |
|---------------------------|------------|----------|----------|-------------|
| Top Hour                  | 2:15 PM    | 3:15 PM  | 151      | 8           |
| 2nd Highest Hour          | 12:00 PM   | 1:00 PM  | 130      | 23          |
| 3rd Highest Hour          | 7:30 AM    | 8:30 AM  | 119      | 13          |
| 4th Highest Hour          | 7:45 AM    | 8:45 AM  | 122      | 0           |

| Top Hours for Figure 4C-6 | Start Time | End Time | Vehicles | Pedestrians |
|---------------------------|------------|----------|----------|-------------|
| Top Hour                  | 2:15 PM    | 3:15 PM  | 151      | 8           |
| 2nd Highest Hour          | 12:00 PM   | 1:00 PM  | 130      | 23          |
| 3rd Highest Hour          | 7:30 AM    | 8:30 AM  | 119      | 13          |
| 4th Highest Hour          | 9:30 AM    | 10:30 AM | 107      | 13          |

Peak Hour Used for Graphs 4C-7 & 4C-8

Top Hour

| Start Time | End Time | Vehicles | Pedestrians |
|------------|----------|----------|-------------|
| 2:15 PM    | 3:15 PM  | 151      | 8           |

Number of Hours That Met the 4-Hour Criteria 4C-5

Number of Hours That Met the 4-Hour Criteria 4C-6

Figure 4C-5. Warrant 4, Pedestrians Four-Hour Volume

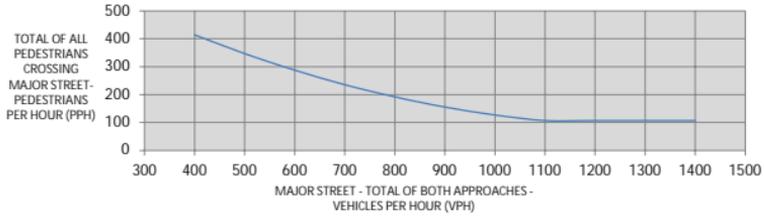


Figure 4C-6. Warrant 4, Pedestrian Four Hour Volume (70% Factor)

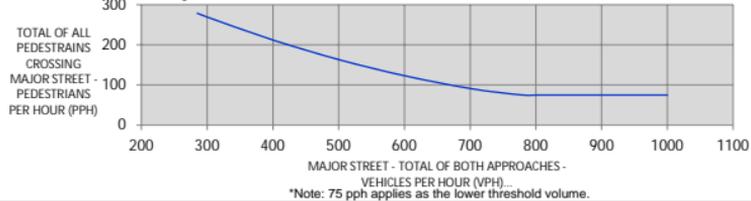
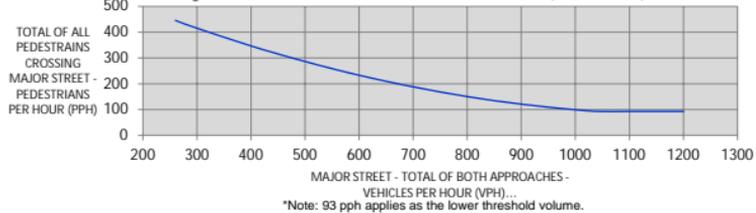


Figure 4C-7. Warrant 4, Pedestrian Peak Hour



Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



## STUDY AND ANALYSIS INFORMATION

|                            |                     |   |                         |
|----------------------------|---------------------|---|-------------------------|
| Municipality:              | Stubenville         | Traffic Volumes Obtained By:                      | Smart Services          |
| County:                    | Jefferson           | Analysis Date:                                    | 11/6/2024               |
| ODOT Engineering District: | 11                  | Agency/ Company Name Performing Warrant Analysis: | Strand Associates, Inc. |
| Google map link:           | <a href="#">Map</a> |   |                         |

### Analysis Information

Data Collection Date: 9/10/2024  
 Day of the Week: Tuesday

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Existing Traffic Signal at intersection: Yes

Total Number of Approaches at Intersection: 4

### Major Street Information

Major Street Name and Route Number: 4th St

Major Street Approach Direction: N-Bound  
S-Bound

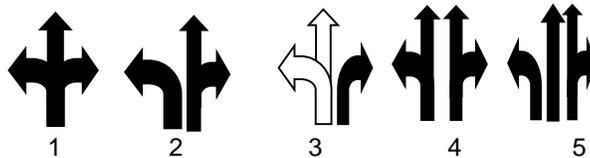
Number of Thru Lanes on Each Major Street Approach: 1 LANE(S)

Speed Limit or 85th Percentile Speed on the Major Street\*: 25 MPH  
\*Unknown assumes below 45 mph

### Minor Street Information

Minor Street Name and Route Number: Market St

Minor Street Approach Configuration: 3 E-Bound  
3 W-Bound



Number of Thru Lanes on Each Minor Street Approach: 1 LANE(S)  
 Apply Right Turn Lane Reduction\*: Yes

\*Right Turn Lane Reduction Shall be used for Warrants 1, 2, & 3 for New ODOT Signals. Please refer to TEM 402-3.2 for clarification and criteria under which Right Turn Reduction is not required.

## TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

|  | Warrant     |            | Notes and Comments:  |                  |          |         |
|--|-------------|------------|--|------------------|----------|---------|
|  | Applicable? | Satisfied? |  |                  |          |         |
| <b>Warrant 1, Eight-Hour Vehicular Volume</b>  | Yes         | No         |  |                  |          |         |
| <b>Warrant 2, Four-Hour Vehicular Volume</b>   | Yes         | No         |  |                  |          |         |
| <b>Warrant 3, Peak Hour</b>  | Yes         | No         | Signals installed under Warrant 3 should be traffic actuated. <table border="1" style="float: right; margin-top: 5px;"> <tr><td style="text-align: center;"><b>Peak Hour</b></td></tr> <tr><td style="text-align: center;">12:00 PM</td></tr> <tr><td style="text-align: center;">1:00 PM</td></tr> </table>   | <b>Peak Hour</b> | 12:00 PM | 1:00 PM |
| <b>Peak Hour</b>   |             |            |  |                  |          |         |
| 12:00 PM   |             |            |  |                  |          |         |
| 1:00 PM  |             |            |  |                  |          |         |
| For Warrants 1-3, new ODOT signals must be based off of 100% volume thresholds (TEM 402-3.2) |             |            |  |                  |          |         |
| <b>Warrant 4, Pedestrian Volume</b>  | Yes         | No         | If this warrant is met, and a traffic control signal is justified by an engineering study, the traffic control signal shall be equipped with pedestrian signal heads complying with the provisions set forth in Chapter 4E of the OMUTCD. <table border="1" style="float: right; margin-top: 5px;"> <tr><td style="text-align: center;"><b>Peak Hour</b></td></tr> <tr><td style="text-align: center;">12:00 PM</td></tr> <tr><td style="text-align: center;">1:00 PM</td></tr> </table> | <b>Peak Hour</b> | 12:00 PM | 1:00 PM |
| <b>Peak Hour</b>   |             |            |  |                  |          |         |
| 12:00 PM   |             |            |  |                  |          |         |
| 1:00 PM  |             |            |  |                  |          |         |
| <b>Warrant 5, School Crossing</b>  | No          |            | N/A  |                  |          |         |
| <b>Warrant 6, Coordinated Signal System</b>  | No          |            | (Shall not be used as the sole warrant in the analysis)  |                  |          |         |
| <b>Warrant 7, Crash Experience</b>   | No          |            | If this is the sole warrant, signal must be semi-actuated with control devices which provide proper coordination if installed at an intersection within a coordinated system and normally should be fully traffic actuated if installed at an isolated intersection.   |                  |          |         |
| <b>Warrant 8, Roadway Network</b>  | No          |            | (Shall not be used as the sole warrant in the analysis)  |                  |          |         |
| <b>Warrant 9, Intersection Near a Grade Crossing</b>   | No          |            | Figure 4C-9  |                  |          |         |
| <b>Multi-Way Stop Warrant</b>  | Yes         | Yes        | May be used as an interim measure if traffic signal warrants are satisfied.  |                  |          |         |

**The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.**

If no warrants are satisfied, additional options may be considered:

1. An engineering study, performed by a firm prequalified by ODOT for signal design, if approved by the ODOT district, may be used to justify a new signal installation or retention of an existing signal that otherwise does not meet the published warrants. An example of such an instance is a traffic signal in proximity to a railroad crossing that serves to reduce queuing across the tracks.
2. According to TEM 402-2, If the actual turning movement counts fail to satisfy a signal warrant, it may be acceptable to use traffic volumes projected to the second year after project completion. The **Modeling and Forecasting Section** should provide the projected traffic volumes.
3. A pedestrian hybrid beacon may be considered for installation to facilitate pedestrian crossings at a location that does not meet traffic signal warrants (see Chapter 4C of TEM) or at a location that meets traffic signal warrants under Sections 4C.05 and/or 4C.06 but a decision is made to not install a traffic control signal. **Please fill inputs on PHB Score Sheet and submit to ODOT.**

Considerations such as geometrics and lack of sight distance generally have not been accepted in lieu of satisfying signal warrants. These considerations may allow an otherwise unwarranted traffic signal to be retained at **100 percent** local cost. Please review TEM 402-4 for details.

Conclusion: **Do Not Retain Existing Traffic Signal**

Notes:

## OMUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach

|               |        |
|---------------|--------|
| Major Street: | 1 Lane |
| Minor Street: | 1 Lane |

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? No

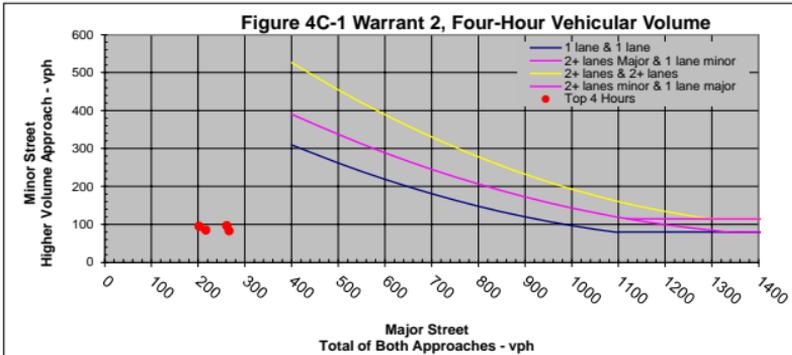
*\*Only applicable after an adequate trial of other alternatives (See section 4C.02.06 of the 2012 OMUTCD)*

| Lanes Major/Minor | Adjusted Volumes |       | Condition A |      |      |      | Condition B |      |      |      | Combination A/B* |      |      |      |      |      |      |      |
|-------------------|------------------|-------|-------------|------|------|------|-------------|------|------|------|------------------|------|------|------|------|------|------|------|
|                   |                  |       | 100%        |      | 70%  |      | 100%        |      | 70%  |      | 80%              |      | 80%  |      | 56%  |      | 56%  |      |
|                   | Major            | Minor | Maj.        | Min. | Maj. | Min. | Maj.        | Min. | Maj. | Min. | Maj.             | Min. | Maj. | Min. | Maj. | Min. | Maj. | Min. |
| 1 / 1             | X                |       | 500         | 150  | 350  | 105  | 750         | 75   | 525  | 53   | 400              | 120  | 600  | 60   | 280  | 84   | 420  | 42   |
| 2+ / 1            |                  |       | 600         | 150  | 420  | 105  | 900         | 75   | 630  | 53   | 480              | 120  | 720  | 60   | 336  | 84   | 504  | 42   |
| 2+ / 2+           |                  |       | 600         | 200  | 420  | 140  | 900         | 100  | 630  | 70   | 480              | 160  | 720  | 80   | 336  | 112  | 504  | 56   |
| 1 / 2+            |                  |       | 500         | 200  | 350  | 140  | 750         | 100  | 525  | 70   | 400              | 160  | 600  | 80   | 280  | 112  | 420  | 56   |
| 12:00 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:15 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:30 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:45 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:15 AM           | 23               | 4     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:30 AM           | 47               | 13    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:45 AM           | 75               | 18    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:00 AM           | 115              | 35    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:15 AM           | 115              | 43    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:30 AM           | 141              | 58    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:45 AM           | 152              | 66    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:00 AM           | 159              | 63    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:15 AM           | 167              | 67    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:30 AM           | 156              | 60    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:45 AM           | 152              | 60    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:00 AM           | 150              | 61    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:15 AM           | 164              | 59    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:30 AM           | 158              | 54    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:45 AM           | 179              | 59    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:00 AM          | 187              | 66    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:15 AM          | 179              | 80    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |



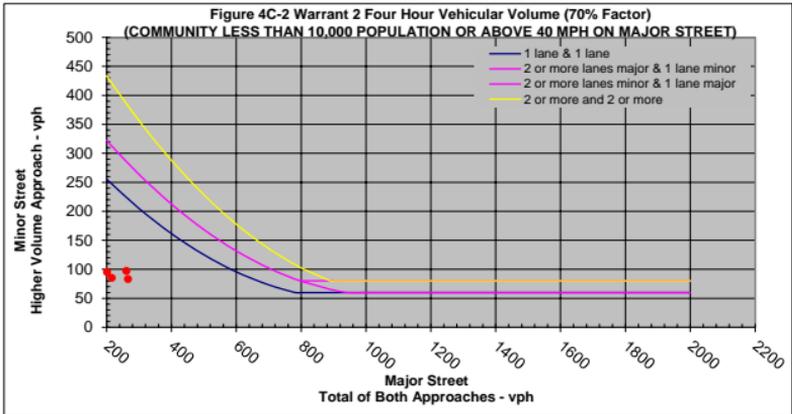
## OMUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

| Number of Lanes for Moving Traffic on Each Approach   |                    | Total Number of Unique Hours Met on Figure 4C-1              |                   |         |                              | 0  |           |                        |
|---|--------------------|--|-------------------|---------|------------------------------|--|-----------|------------------------|
| Major street: 1 Lane  |                    | Total Number of Unique Hours Met on Figure 4C-2 (70% Factor) |                   |         |                              | 0  |           |                        |
| Minor Street: 1 Lane  |                    |  |                   |         |                              |  |           |                        |
| Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? |                    |  |                   |         |                              |  |           |                        |
| No  |                    |  |                   |         |                              |  |           |                        |
| Hour Interval Beginning At  | Raw Traffic Counts |  |                   |         | Total Major Approach Volumes | Highest Actual Minor Street Approach Volumes | Hour Met? | Hour Met? (70% Factor) |
|   | Major - 4th St     |  | Minor - Market St |         |                              |  |           |                        |
|   | N-Bound            | S-Bound  | W-Bound           | E-Bound |                              |  |           |                        |
| 6:00 AM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |
| 6:15 AM   | 15                 | 8  | 4                 | 3       | 23                           | 4  |           |                        |
| 6:30 AM   | 31                 | 16   | 7                 | 13      | 47                           | 13   |           |                        |
| 6:45 AM   | 50                 | 25   | 15                | 18      | 75                           | 18   |           |                        |
| 7:00 AM   | 76                 | 39   | 20                | 35      | 115                          | 35   |           |                        |
| 7:15 AM   | 75                 | 40   | 24                | 43      | 115                          | 43   |           |                        |
| 7:30 AM   | 93                 | 48   | 30                | 58      | 141                          | 58   |           |                        |
| 7:45 AM   | 93                 | 59   | 31                | 66      | 152                          | 66   |           |                        |
| 8:00 AM   | 98                 | 61   | 34                | 63      | 159                          | 63   |           |                        |
| 8:15 AM   | 102                | 65   | 40                | 67      | 167                          | 67   |           |                        |
| 8:30 AM   | 87                 | 69   | 34                | 60      | 156                          | 60   |           |                        |
| 8:45 AM   | 88                 | 64   | 34                | 60      | 152                          | 60   |           |                        |
| 9:00 AM   | 83                 | 67   | 32                | 61      | 150                          | 61   |           |                        |
| 9:15 AM   | 88                 | 76   | 24                | 59      | 164                          | 59   |           |                        |
| 9:30 AM   | 92                 | 66   | 37                | 54      | 158                          | 54   |           |                        |
| 9:45 AM   | 96                 | 81   | 36                | 59      | 179                          | 59   |           |                        |
| 10:00 AM  | 102                | 85   | 37                | 66      | 187                          | 66   |           |                        |
| 10:15 AM  | 101                | 78   | 46                | 80      | 179                          | 80   |           |                        |
| 10:30 AM  | 108                | 94   | 38                | 88      | 202                          | 88   |           |                        |
| 10:45 AM  | 113                | 96   | 31                | 90      | 209                          | 90   |           |                        |
| 11:00 AM  | 102                | 100  | 36                | 95      | 202                          | 95   |           |                        |
| 11:15 AM  | 113                | 109  | 38                | 93      | 222                          | 93   |           |                        |
| 11:30 AM  | 121                | 112  | 43                | 94      | 233                          | 94   |           |                        |
| 11:45 AM  | 131                | 104  | 51                | 99      | 235                          | 99   |           |                        |
| 12:00 PM  | 152                | 109  | 54                | 97      | 261                          | 97   |           |                        |
| 12:15 PM  | 148                | 110  | 46                | 87      | 258                          | 87   |           |                        |
| 12:30 PM  | 133                | 107  | 45                | 79      | 240                          | 79   |           |                        |
| 12:45 PM  | 115                | 108  | 49                | 82      | 223                          | 82   |           |                        |
| 1:00 PM   | 105                | 91   | 39                | 76      | 196                          | 76   |           |                        |
| 1:15 PM   | 110                | 89   | 42                | 82      | 199                          | 82   |           |                        |
| 1:30 PM   | 129                | 91   | 42                | 86      | 220                          | 86   |           |                        |
| 1:45 PM   | 139                | 100  | 41                | 80      | 239                          | 80   |           |                        |
| 2:00 PM   | 147                | 108  | 38                | 89      | 255                          | 89   |           |                        |
| 2:15 PM   | 142                | 124  | 41                | 83      | 266                          | 83   |           |                        |
| 2:30 PM   | 129                | 118  | 35                | 87      | 247                          | 87   |           |                        |
| 2:45 PM   | 126                | 110  | 33                | 82      | 236                          | 82   |           |                        |
| 3:00 PM   | 113                | 118  | 41                | 69      | 231                          | 69   |           |                        |
| 3:15 PM   | 109                | 107  | 35                | 85      | 216                          | 85   |           |                        |
| 3:30 PM   | 107                | 106  | 35                | 79      | 213                          | 79   |           |                        |
| 3:45 PM   | 97                 | 97   | 39                | 86      | 194                          | 86   |           |                        |
| 4:00 PM   | 96                 | 87   | 35                | 80      | 193                          | 80   |           |                        |
| 4:15 PM   | 96                 | 77   | 38                | 63      | 173                          | 63   |           |                        |
| 4:30 PM   | 92                 | 73   | 37                | 54      | 165                          | 54   |           |                        |
| 4:45 PM   | 91                 | 71   | 28                | 46      | 162                          | 46   |           |                        |
| 5:00 PM   | 83                 | 68   | 31                | 49      | 151                          | 49   |           |                        |
| 5:15 PM   | 81                 | 73   | 24                | 42      | 154                          | 42   |           |                        |
| 5:30 PM   | 68                 | 68   | 23                | 42      | 136                          | 42   |           |                        |
| 5:45 PM   | 63                 | 64   | 21                | 35      | 127                          | 35   |           |                        |
| 6:00 PM   | 64                 | 64   | 18                | 37      | 128                          | 37   |           |                        |
| 6:15 PM   | 41                 | 41   | 13                | 31      | 82                           | 31   |           |                        |
| 6:30 PM   | 31                 | 29   | 10                | 23      | 60                           | 23   |           |                        |
| 6:45 PM   | 17                 | 18   | 7                 | 16      | 35                           | 16   |           |                        |
| 7:00 PM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |
| 7:15 PM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |
| 7:30 PM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |
| 7:45 PM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |
| 8:00 PM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |



| Top Hours for Figure 4C-1 |            |          |              |              |  |
|---------------------------|------------|----------|--------------|--------------|--|
|                           | Start Time | End Time | Major Street | Minor Street |  |
| Top Hour                  | 12:00 PM   | 1:00 PM  | 261          | 97           |  |
| 2nd Highest Hour          | 2:15 PM    | 3:15 PM  | 266          | 83           |  |
| 3rd Highest Hour          | 11:00 AM   | 12:00 PM | 202          | 95           |  |
| 4th Highest Hour          | 3:15 PM    | 4:15 PM  | 216          | 85           |  |

| Top Hours for Figure 4C-2 |            |          |              |              |  |
|---------------------------|------------|----------|--------------|--------------|--|
|                           | Start Time | End Time | Major Street | Minor Street |  |
| Top Hour                  | 12:00 PM   | 1:00 PM  | 261          | 97           |  |
| 2nd Highest Hour          | 2:15 PM    | 3:15 PM  | 266          | 83           |  |
| 3rd Highest Hour          | 11:00 AM   | 12:00 PM | 202          | 95           |  |
| 4th Highest Hour          | 3:15 PM    | 4:15 PM  | 216          | 85           |  |



Are the requirements for Warrant 2 met?:

### OMUTCD WARRANT 3, PEAK HOUR

|   |                      |          |
|---|----------------------|----------|
| Number of Lanes for Moving Traffic on Each Approach | Peak Hour Start time | 12:00 PM |
| Major Street: 1 Lane                                | Peak Hour End Time   | 1:00 PM  |
| Minor Street: 1 Lane                                |                      |          |

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street?

No

Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?

No

**Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present\***

Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?

Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?

No

Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?

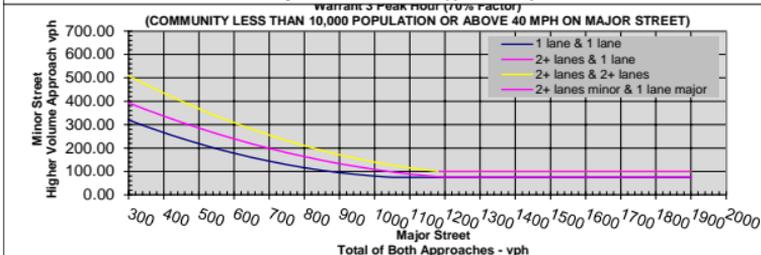
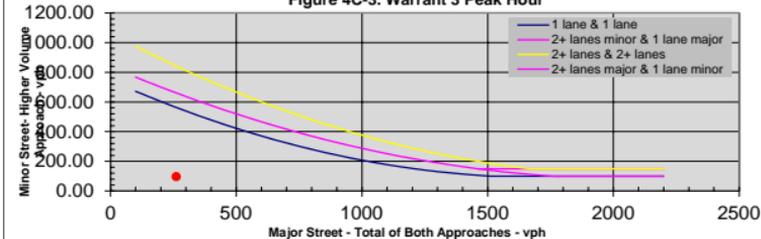
No

*\*If applicable, attach all supporting calculations and documentation.*

Are the requirements for Warrant 3 met?:

No

**Figure 4C-3. Warrant 3 Peak Hour**



| Hour Vehicular Volume      |   |   |  |   |
|----------------------------|---|---|--|---|
| Hour Interval Beginning At | Major Street Combined Vehicles Per Hour (VPH) | Highest Minor Street Approach Vehicles Per Hour (VPH) | Sum of Major Street and Highest Minor Street | Sum of Major Street and Combined Minor Street |
| 6:00 AM                    | 0   | 0   | 0  | 0   |
| 6:15 AM                    | 23  | 4   | 27   | 30  |
| 6:30 AM                    | 47  | 13  | 60   | 67  |
| 6:45 AM                    | 75  | 18  | 93   | 108   |
| 7:00 AM                    | 115   | 35  | 150  | 170   |
| 7:15 AM                    | 115   | 43  | 158  | 182   |
| 7:30 AM                    | 141   | 58  | 199  | 229   |
| 7:45 AM                    | 152   | 66  | 218  | 249   |
| 8:00 AM                    | 159   | 63  | 222  | 256   |
| 8:15 AM                    | 167   | 67  | 234  | 274   |
| 8:30 AM                    | 156   | 60  | 216  | 250   |
| 8:45 AM                    | 152   | 60  | 212  | 246   |
| 9:00 AM                    | 150   | 61  | 211  | 243   |
| 9:15 AM                    | 164   | 59  | 223  | 247   |
| 9:30 AM                    | 158   | 54  | 212  | 249   |
| 9:45 AM                    | 179   | 59  | 238  | 274   |
| 10:00 AM                   | 187   | 66  | 253  | 290   |
| 10:15 AM                   | 179   | 80  | 259  | 305   |
| 10:30 AM                   | 202   | 88  | 290  | 328   |
| 10:45 AM                   | 209   | 90  | 299  | 330   |
| 11:00 AM                   | 202   | 95  | 297  | 333   |
| 11:15 AM                   | 222   | 93  | 315  | 353   |
| 11:30 AM                   | 233   | 94  | 327  | 370   |
| 11:45 AM                   | 236   | 99  | 334  | 385   |
| 12:00 PM                   | 261   | 97  | 358  | 412   |
| 12:15 PM                   | 258   | 87  | 345  | 391   |
| 12:30 PM                   | 240   | 79  | 319  | 364   |
| 12:45 PM                   | 223   | 82  | 305  | 354   |
| 1:00 PM                    | 196   | 76  | 272  | 311   |
| 1:15 PM                    | 199   | 82  | 281  | 323   |
| 1:30 PM                    | 220   | 86  | 306  | 348   |
| 1:45 PM                    | 239   | 80  | 319  | 360   |
| 2:00 PM                    | 255   | 89  | 344  | 382   |
| 2:15 PM                    | 266   | 83  | 349  | 390   |
| 2:30 PM                    | 247   | 87  | 334  | 369   |
| 2:45 PM                    | 236   | 82  | 318  | 351   |
| 3:00 PM                    | 231   | 69  | 300  | 341   |
| 3:15 PM                    | 216   | 85  | 301  | 336   |
| 3:30 PM                    | 213   | 79  | 292  | 327   |
| 3:45 PM                    | 194   | 86  | 280  | 319   |
| 4:00 PM                    | 183   | 80  | 263  | 298   |
| 4:15 PM                    | 173   | 63  | 236  | 274   |
| 4:30 PM                    | 165   | 54  | 219  | 256   |
| 4:45 PM                    | 162   | 46  | 208  | 236   |
| 5:00 PM                    | 151   | 49  | 200  | 231   |
| 5:15 PM                    | 154   | 42  | 196  | 220   |
| 5:30 PM                    | 136   | 42  | 178  | 201   |
| 5:45 PM                    | 127   | 35  | 162  | 183   |
| 6:00 PM                    | 128   | 37  | 165  | 183   |
| 6:15 PM                    | 82  | 31  | 113  | 126   |
| 6:30 PM                    | 60  | 23  | 83   | 93  |
| 6:45 PM                    | 35  | 16  | 51   | 58  |
| 7:00 PM                    | 0   | 0   | 0  | 0   |
| 7:15 PM                    | 0   | 0   | 0  | 0   |
| 7:30 PM                    | 0   | 0   | 0  | 0   |
| 7:45 PM                    | 0   | 0   | 0  | 0   |
| 8:00 PM                    | 0   | 0   | 0  | 0   |

| Actual Peak Hour Major Traffic Volume | Actual Peak Hour Minor Traffic Volume | Required Peak Hour Minor Traffic Volume for Fig. 4C-3 | Required Peak Hour Minor Traffic Volume for Fig. 4C-4 |
|---------------------------------------|---------------------------------------|---|---|
| 261                                   | 97                                    | 563   | 343   |

## OMUTCD WARRANT 4, PEDESTRIAN VOLUME

| Hour Interval<br>Beginning At | Major Street<br>Combined<br>Vehicles Per<br>Hour (VPH) | Total of All<br>Pedestrians<br>Crossing Major<br>Street<br>Pedestrians Per<br>Hour (PPH) |
|-------------------------------|--|--|
| 6:00 AM                       | 0  | 0  |
| 6:15 AM                       | 23   | 0  |
| 6:30 AM                       | 47   | 1  |
| 6:45 AM                       | 75   | 1  |
| 7:00 AM                       | 115  | 1  |
| 7:15 AM                       | 115  | 1  |
| 7:30 AM                       | 141  | 1  |
| 7:45 AM                       | 152  | 3  |
| 8:00 AM                       | 159  | 9  |
| 8:15 AM                       | 167  | 11   |
| 8:30 AM                       | 156  | 14   |
| 8:45 AM                       | 152  | 20   |
| 9:00 AM                       | 150  | 20   |
| 9:15 AM                       | 164  | 24   |
| 9:30 AM                       | 158  | 26   |
| 9:45 AM                       | 179  | 23   |
| 10:00 AM                      | 187  | 21   |
| 10:15 AM                      | 179  | 20   |
| 10:30 AM                      | 202  | 21   |
| 10:45 AM                      | 209  | 21   |
| 11:00 AM                      | 202  | 25   |
| 11:15 AM                      | 222  | 27   |
| 11:30 AM                      | 233  | 31   |
| 11:45 AM                      | 235  | 36   |
| 12:00 PM                      | 261  | 35   |
| 12:15 PM                      | 258  | 33   |
| 12:30 PM                      | 240  | 23   |
| 12:45 PM                      | 223  | 17   |
| 1:00 PM                       | 196  | 18   |
| 1:15 PM                       | 199  | 20   |
| 1:30 PM                       | 220  | 32   |
| 1:45 PM                       | 239  | 32   |
| 2:00 PM                       | 255  | 30   |
| 2:15 PM                       | 266  | 27   |
| 2:30 PM                       | 247  | 18   |
| 2:45 PM                       | 236  | 22   |
| 3:00 PM                       | 231  | 20   |
| 3:15 PM                       | 216  | 21   |
| 3:30 PM                       | 213  | 22   |
| 3:45 PM                       | 194  | 15   |
| 4:00 PM                       | 183  | 22   |
| 4:15 PM                       | 173  | 21   |
| 4:30 PM                       | 165  | 18   |
| 4:45 PM                       | 162  | 21   |
| 5:00 PM                       | 151  | 14   |
| 5:15 PM                       | 154  | 17   |
| 5:30 PM                       | 136  | 17   |
| 5:45 PM                       | 127  | 17   |
| 6:00 PM                       | 128  | 17   |
| 6:15 PM                       | 82   | 10   |
| 6:30 PM                       | 60   | 8  |
| 6:45 PM                       | 35   | 4  |
| 7:00 PM                       | 0  | 0  |
| 7:15 PM                       | 0  | 0  |
| 7:30 PM                       | 0  | 0  |
| 7:45 PM                       | 0  | 0  |
| 8:00 PM                       | 0  | 0  |

**Built-up Isolated Community With Less Than 10,000 Population or Above 35 MPH on Major Street?**

**15th Percentile Pedestrian Crossing Speed Less than 3.5 f/s?\***

*\*If applicable, attach all supporting calculations, documentation, and findings.*

If 15th Percentile Pedestrian Crossing Speed is Less than 3.5 f/s,  
Reduce Criterion by (up to 50%):

**Is the distance to the nearest traffic control signal or STOP sign controlling the major street that pedestrians desire to cross less than 300 feet?**

If the distance to the nearest traffic control signal or STOP sign controlling the major street that pedestrians desire to cross is less than 300 feet, will the proposed traffic control signal restrict the progressive movement of traffic? If applicable, attach supporting justification.

**Does the intersection meet the 4-Hour Volume?**

**Does the intersection meet the Peak Hour?**

**Are the Requirements for Warrant 4 Satisfied?**

| Top Hours for Figure 4C-5 | Start Time | End Time | Vehicles | Pedestrians |
|---------------------------|------------|----------|----------|-------------|
| Top Hour                  | 12:00 PM   | 1:00 PM  | 261      | 35          |
| 2nd Highest Hour          | 2:15 PM    | 3:15 PM  | 266      | 27          |
| 3rd Highest Hour          | 3:15 PM    | 4:15 PM  | 216      | 21          |
| 4th Highest Hour          | 10:45 AM   | 11:45 AM | 209      | 21          |

| Top Hours for Figure 4C-6 | Start Time | End Time | Vehicles | Pedestrians |
|---------------------------|------------|----------|----------|-------------|
| Top Hour                  | 12:00 PM   | 1:00 PM  | 261      | 35          |
| 2nd Highest Hour          | 2:15 PM    | 3:15 PM  | 266      | 27          |
| 3rd Highest Hour          | 3:15 PM    | 4:15 PM  | 216      | 21          |
| 4th Highest Hour          | 10:45 AM   | 11:45 AM | 209      | 21          |

Peak Hour Used for Graphs 4C-7 & 4C-8

Top Hour

| Start Time | End Time | Vehicles | Pedestrians |
|------------|----------|----------|-------------|
| 12:00 PM   | 1:00 PM  | 261      | 35          |

Number of Hours That Met the 4-Hour Criteria 4C-5

Number of Hours That Met the 4-Hour Criteria 4C-6

Figure 4C-5. Warrant 4, Pedestrians Four-Hour Volume

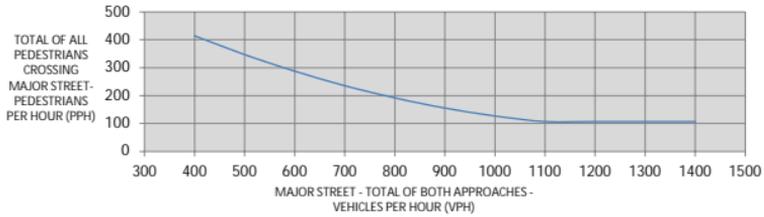


Figure 4C-6. Warrant 4, Pedestrian Four Hour Volume (70% Factor)

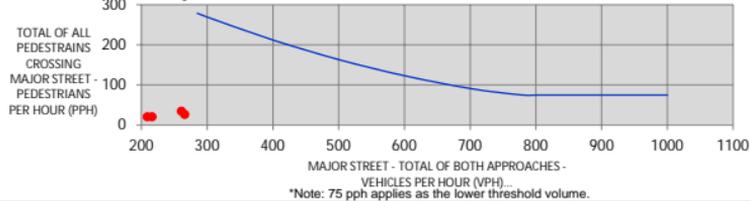
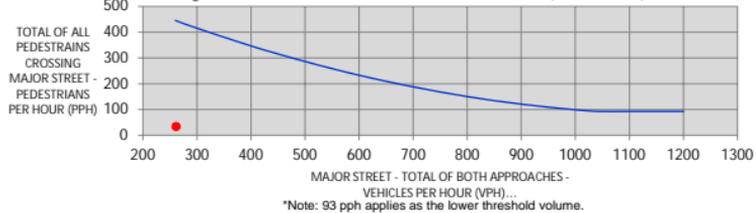


Figure 4C-7. Warrant 4, Pedestrian Peak Hour



Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



## STUDY AND ANALYSIS INFORMATION

|                            |                     |   |                         |
|----------------------------|---------------------|---|-------------------------|
| Municipality:              | Stubenville         | Traffic Volumes Obtained By:                      | Smart Services          |
| County:                    | Jefferson           | Analysis Date:                                    | 11/6/2024               |
| ODOT Engineering District: | 11                  | Agency/ Company Name Performing Warrant Analysis: | Strand Associates, Inc. |
| Google map link:           | <a href="#">Map</a> |   |                         |

### Analysis Information

Data Collection Date: 4/13/2021  
 Day of the Week: Tuesday

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Existing Traffic Signal at intersection: Yes

Total Number of Approaches at Intersection: 3

### Major Street Information

Major Street Name and Route Number: Market St

Major Street Approach Direction: E-Bound  
W-Bound

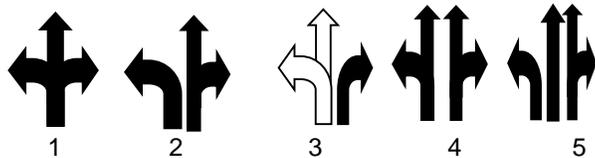
Number of Thru Lanes on Each Major Street Approach: 1 LANE(S)

Speed Limit or 85th Percentile Speed on the Major Street\*: 25 MPH  
\*Unknown assumes below 45 mph

### Minor Street Information

Minor Street Name and Route Number: 5th St

Minor Street Approach Configuration: 2    N-Bound  
S-Bound



Number of Thru Lanes on Each Minor Street Approach: 1 LANE(S)  
 Apply Right Turn Lane Reduction\*: Yes

\*Right Turn Lane Reduction Shall be used for Warrants 1, 2, & 3 for New ODOT Signals. Please refer to TEM 402-3.2 for clarification and criteria under which Right Turn Reduction is not required.

**TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS**

|  | Warrant     |            | Notes and Comments:  |                  |          |         |
|--|-------------|------------|--|------------------|----------|---------|
|  | Applicable? | Satisfied? |  |                  |          |         |
| <b>Warrant 1, Eight-Hour Vehicular Volume</b>  | Yes         | No         |  |                  |          |         |
| <b>Warrant 2, Four-Hour Vehicular Volume</b>   | Yes         | No         |  |                  |          |         |
| <b>Warrant 3, Peak Hour</b>  | Yes         | No         | Signals installed under Warrant 3 should be traffic actuated.<br><table border="1" style="float: right;"> <tr><td><b>Peak Hour</b></td></tr> <tr><td>12:00 PM</td></tr> <tr><td>1:00 PM</td></tr> </table>   | <b>Peak Hour</b> | 12:00 PM | 1:00 PM |
| <b>Peak Hour</b>   |             |            |  |                  |          |         |
| 12:00 PM   |             |            |  |                  |          |         |
| 1:00 PM  |             |            |  |                  |          |         |
| For Warrants 1-3, new ODOT signals must be based off of 100% volume thresholds (TEM 402-3.2) |             |            |  |                  |          |         |
| <b>Warrant 4, Pedestrian Volume</b>  | Yes         | No         | If this warrant is met, and a traffic control signal is justified by an engineering study, the traffic control signal shall be equipped with pedestrian signal heads complying with the provisions set forth in Chapter 4E of the OMUTCD.<br><table border="1" style="float: right;"> <tr><td><b>Peak Hour</b></td></tr> <tr><td>12:00 PM</td></tr> <tr><td>1:00 PM</td></tr> </table> | <b>Peak Hour</b> | 12:00 PM | 1:00 PM |
| <b>Peak Hour</b>   |             |            |  |                  |          |         |
| 12:00 PM   |             |            |  |                  |          |         |
| 1:00 PM  |             |            |  |                  |          |         |
| <b>Warrant 5, School Crossing</b>  | No          |            | N/A  |                  |          |         |
| <b>Warrant 6, Coordinated Signal System</b>  | No          |            | (Shall not be used as the sole warrant in the analysis)  |                  |          |         |
| <b>Warrant 7, Crash Experience</b>   | No          |            | If this is the sole warrant, signal must be semi-actuated with control devices which provide proper coordination if installed at an intersection within a coordinated system and normally should be fully traffic actuated if installed at an isolated intersection.   |                  |          |         |
| <b>Warrant 8, Roadway Network</b>  | No          |            | (Shall not be used as the sole warrant in the analysis)  |                  |          |         |
| <b>Warrant 9, Intersection Near a Grade Crossing</b>   | No          |            | Figure 4C-9  |                  |          |         |
| <b>Multi-Way Stop Warrant</b>  | Yes         | Yes        | May be used as an interim measure if traffic signal warrants are satisfied.  |                  |          |         |

**The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.**

|   |
|---|
| If no warrants are satisfied, additional options may be considered:   |
| 1. An engineering study, performed by a firm prequalified by ODOT for signal design, if approved by the ODOT district, may be used to justify a new signal installation or retention of an existing signal that otherwise does not meet the published warrants. An example of such an instance is a traffic signal in proximity to a railroad crossing that serves to reduce queuing across the tracks.     |
| 2. According to TEM 402-2, If the actual turning movement counts fail to satisfy a signal warrant, it may be acceptable to use traffic volumes projected to the second year after project completion. The <b>Modeling and Forecasting Section</b> should provide the projected traffic volumes.   |
| 3. A pedestrian hybrid beacon may be considered for installation to facilitate pedestrian crossings at a location that does not meet traffic signal warrants (see Chapter 4C of TEM) or at a location that meets traffic signal warrants under Sections 4C.05 and/or 4C.06 but a decision is made to not install a traffic control signal. <b>Please fill inputs on PHB Score Sheet and submit to ODOT.</b> |

Considerations such as geometrics and lack of sight distance generally have not been accepted in lieu of satisfying signal warrants. These considerations may allow an otherwise unwarranted traffic signal to be retained at **100 percent** local cost. Please review TEM 402-4 for details.

Conclusion: **Do Not Retain Existing Traffic Signal**

Notes:

## OMUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic  
on Each Approach

|               |        |
|---------------|--------|
| Major Street: | 1 Lane |
| Minor Street: | 1 Lane |

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? No

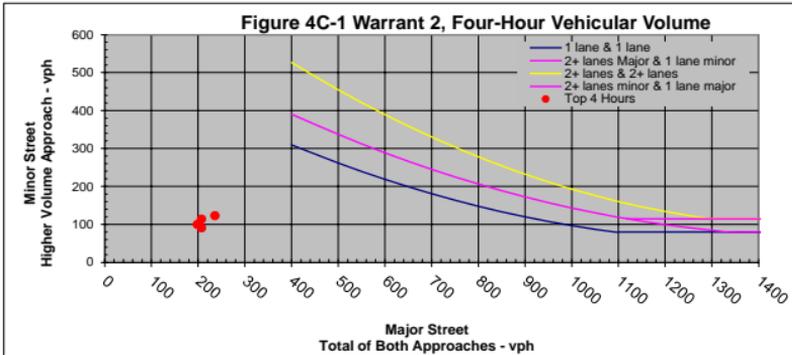
*\*Only applicable after an adequate trial of other alternatives (See section 4C.02.06 of the 2012 OMUTCD)*

| Lanes<br>Major/<br>Minor | Adjusted<br>Volumes |       | Condition A |      |      |      | Condition B |      |      |      | Combination A/B* |      |      |      |      |      |      |      |
|--------------------------|---------------------|-------|-------------|------|------|------|-------------|------|------|------|------------------|------|------|------|------|------|------|------|
|                          |                     |       | 100%        |      | 70%  |      | 100%        |      | 70%  |      | 80%              |      | 80%  |      | 56%  |      | 56%  |      |
|                          | Major               | Minor | Maj.        | Min. | Maj. | Min. | Maj.        | Min. | Maj. | Min. | Maj.             | Min. | Maj. | Min. | Maj. | Min. | Maj. | Min. |
| 1 / 1                    | X                   |       | 500         | 150  | 350  | 105  | 750         | 75   | 525  | 53   | 400              | 120  | 600  | 60   | 280  | 84   | 420  | 42   |
| 2+ / 1                   |                     |       | 600         | 150  | 420  | 105  | 900         | 75   | 630  | 53   | 480              | 120  | 720  | 60   | 336  | 84   | 504  | 42   |
| 2+ / 2+                  |                     |       | 600         | 200  | 420  | 140  | 900         | 100  | 630  | 70   | 480              | 160  | 720  | 80   | 336  | 112  | 504  | 56   |
| 1 / 2+                   |                     |       | 500         | 200  | 350  | 140  | 750         | 100  | 525  | 70   | 400              | 160  | 600  | 80   | 280  | 112  | 420  | 56   |
| 12:00 AM                 | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:15 AM                 | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:30 AM                 | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:45 AM                 | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:00 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:15 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:30 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:45 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:00 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:15 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:30 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:45 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:00 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:15 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:30 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:45 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:00 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:15 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:30 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:45 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:00 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:15 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:30 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:45 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:00 AM                  | 0                   | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:15 AM                  | 14                  | 1     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:30 AM                  | 32                  | 13    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:45 AM                  | 58                  | 19    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:00 AM                  | 102                 | 50    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:15 AM                  | 111                 | 64    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:30 AM                  | 132                 | 70    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:45 AM                  | 130                 | 83    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:00 AM                  | 130                 | 63    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:15 AM                  | 144                 | 60    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:30 AM                  | 138                 | 62    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:45 AM                  | 150                 | 66    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:00 AM                  | 158                 | 65    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:15 AM                  | 160                 | 68    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:30 AM                  | 161                 | 67    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:45 AM                  | 164                 | 65    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:00 AM                 | 165                 | 73    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:15 AM                 | 186                 | 72    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |



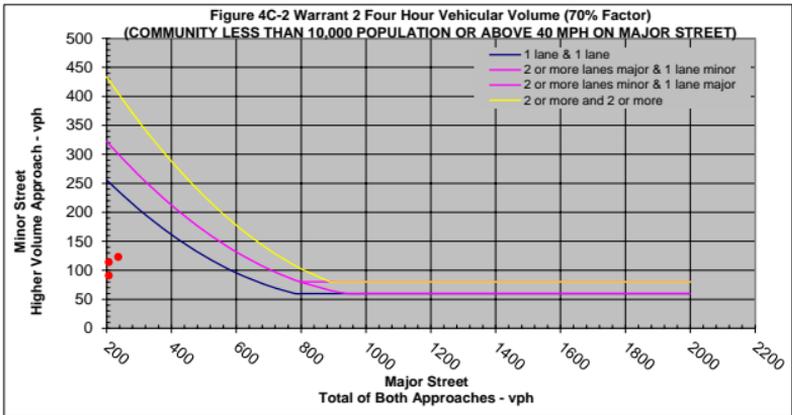
## OMUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

| Number of Lanes for Moving Traffic on Each Approach   |                    | Total Number of Unique Hours Met on Figure 4C-1              |                   |         |                              | 0  |           |                        |
|---|--------------------|--|-------------------|---------|------------------------------|--|-----------|------------------------|
| Major street: 1 Lane  |                    | Total Number of Unique Hours Met on Figure 4C-2 (70% Factor) |                   |         |                              | 0  |           |                        |
| Minor Street: 1 Lane  |                    |  |                   |         |                              |  |           |                        |
| Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? |                    |  |                   |         |                              |  |           |                        |
| No  |                    |  |                   |         |                              |  |           |                        |
| Hour Interval Beginning At  | Raw Traffic Counts |  |                   |         | Total Major Approach Volumes | Highest Actual Minor Street Approach Volumes | Hour Met? | Hour Met? (70% Factor) |
|   | Minor - 5th St     |  | Major - Market St |         |                              |  |           |                        |
|   | N-Bound            | S-Bound  | W-Bound           | E-Bound |                              |  |           |                        |
| 6:00 AM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |
| 6:15 AM   | 0                  | 1  | 3                 | 11      | 14                           | 1  |           |                        |
| 6:30 AM   | 0                  | 13   | 6                 | 26      | 32                           | 13   |           |                        |
| 6:45 AM   | 0                  | 19   | 10                | 48      | 58                           | 19   |           |                        |
| 7:00 AM   | 0                  | 50   | 16                | 86      | 102                          | 50   |           |                        |
| 7:15 AM   | 0                  | 64   | 21                | 90      | 111                          | 64   |           |                        |
| 7:30 AM   | 0                  | 70   | 25                | 107     | 132                          | 70   |           |                        |
| 7:45 AM   | 0                  | 83   | 28                | 102     | 130                          | 83   |           |                        |
| 8:00 AM   | 0                  | 83   | 33                | 97      | 130                          | 83   |           |                        |
| 8:15 AM   | 0                  | 80   | 39                | 105     | 144                          | 80   |           |                        |
| 8:30 AM   | 0                  | 82   | 38                | 100     | 138                          | 82   |           |                        |
| 8:45 AM   | 0                  | 66   | 39                | 111     | 150                          | 66   |           |                        |
| 9:00 AM   | 0                  | 65   | 40                | 118     | 158                          | 65   |           |                        |
| 9:15 AM   | 0                  | 68   | 37                | 123     | 160                          | 68   |           |                        |
| 9:30 AM   | 0                  | 67   | 42                | 119     | 161                          | 67   |           |                        |
| 9:45 AM   | 0                  | 65   | 47                | 117     | 164                          | 65   |           |                        |
| 10:00 AM  | 0                  | 73   | 47                | 118     | 165                          | 73   |           |                        |
| 10:15 AM  | 0                  | 72   | 51                | 135     | 186                          | 72   |           |                        |
| 10:30 AM  | 0                  | 74   | 56                | 141     | 197                          | 74   |           |                        |
| 10:45 AM  | 0                  | 77   | 54                | 150     | 204                          | 77   |           |                        |
| 11:00 AM  | 0                  | 91   | 59                | 148     | 207                          | 91   |           |                        |
| 11:15 AM  | 0                  | 113  | 60                | 145     | 205                          | 113  |           |                        |
| 11:30 AM  | 0                  | 128  | 60                | 157     | 217                          | 128  |           |                        |
| 11:45 AM  | 0                  | 130  | 67                | 156     | 223                          | 130  |           |                        |
| 12:00 PM  | 0                  | 123  | 71                | 165     | 236                          | 123  |           |                        |
| 12:15 PM  | 0                  | 108  | 75                | 156     | 231                          | 108  |           |                        |
| 12:30 PM  | 0                  | 90   | 71                | 146     | 217                          | 90   |           |                        |
| 12:45 PM  | 0                  | 87   | 65                | 149     | 214                          | 87   |           |                        |
| 1:00 PM   | 0                  | 83   | 57                | 135     | 192                          | 83   |           |                        |
| 1:15 PM   | 0                  | 81   | 59                | 139     | 198                          | 81   |           |                        |
| 1:30 PM   | 0                  | 84   | 65                | 140     | 205                          | 84   |           |                        |
| 1:45 PM   | 0                  | 101  | 67                | 136     | 203                          | 101  |           |                        |
| 2:00 PM   | 0                  | 114  | 63                | 144     | 207                          | 114  |           |                        |
| 2:15 PM   | 0                  | 115  | 62                | 135     | 197                          | 115  |           |                        |
| 2:30 PM   | 0                  | 116  | 55                | 134     | 189                          | 116  |           |                        |
| 2:45 PM   | 0                  | 102  | 51                | 136     | 187                          | 102  |           |                        |
| 3:00 PM   | 0                  | 87   | 62                | 126     | 188                          | 87   |           |                        |
| 3:15 PM   | 0                  | 97   | 49                | 142     | 191                          | 97   |           |                        |
| 3:30 PM   | 0                  | 97   | 49                | 146     | 195                          | 97   |           |                        |
| 3:45 PM   | 0                  | 100  | 52                | 146     | 198                          | 100  |           |                        |
| 4:00 PM   | 0                  | 97   | 38                | 133     | 171                          | 97   |           |                        |
| 4:15 PM   | 0                  | 86   | 39                | 118     | 157                          | 86   |           |                        |
| 4:30 PM   | 0                  | 82   | 35                | 105     | 140                          | 82   |           |                        |
| 4:45 PM   | 0                  | 73   | 28                | 100     | 128                          | 73   |           |                        |
| 5:00 PM   | 0                  | 70   | 34                | 100     | 134                          | 70   |           |                        |
| 5:15 PM   | 0                  | 64   | 31                | 91      | 122                          | 64   |           |                        |
| 5:30 PM   | 0                  | 62   | 32                | 89      | 121                          | 62   |           |                        |
| 5:45 PM   | 0                  | 52   | 32                | 74      | 106                          | 52   |           |                        |
| 6:00 PM   | 1                  | 51   | 28                | 80      | 108                          | 51   |           |                        |
| 6:15 PM   | 1                  | 39   | 22                | 60      | 82                           | 39   |           |                        |
| 6:30 PM   | 1                  | 25   | 14                | 40      | 54                           | 25   |           |                        |
| 6:45 PM   | 1                  | 14   | 8                 | 25      | 33                           | 14   |           |                        |
| 7:00 PM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |
| 7:15 PM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |
| 7:30 PM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |
| 7:45 PM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |
| 8:00 PM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |



| Top Hours for Figure 4C-1 |            |          |              |              |  |
|---------------------------|------------|----------|--------------|--------------|--|
|                           | Start Time | End Time | Major Street | Minor Street |  |
| Top Hour                  | 12:00 PM   | 1:00 PM  | 226          | 123          |  |
| 2nd Highest Hour          | 2:00 PM    | 3:00 PM  | 207          | 114          |  |
| 3rd Highest Hour          | 3:45 PM    | 4:45 PM  | 198          | 100          |  |
| 4th Highest Hour          | 11:00 AM   | 12:00 PM | 207          | 91           |  |

| Top Hours for Figure 4C-2 |            |          |              |              |  |
|---------------------------|------------|----------|--------------|--------------|--|
|                           | Start Time | End Time | Major Street | Minor Street |  |
| Top Hour                  | 12:00 PM   | 1:00 PM  | 236          | 123          |  |
| 2nd Highest Hour          | 2:00 PM    | 3:00 PM  | 207          | 114          |  |
| 3rd Highest Hour          | 3:45 PM    | 4:45 PM  | 198          | 100          |  |
| 4th Highest Hour          | 11:00 AM   | 12:00 PM | 207          | 91           |  |



Are the requirements for Warrant 2 met?:  No

### OMUTCD WARRANT 3, PEAK HOUR

|   |                      |          |
|---|----------------------|----------|
| Number of Lanes for Moving Traffic on Each Approach | Peak Hour Start time | 12:00 PM |
| Major Street: 1 Lane                                | Peak Hour End Time   | 1:00 PM  |
| Minor Street: 1 Lane                                |                      |          |

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street?

No

Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?

No

**Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present\***

Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?

Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?

Yes

Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?

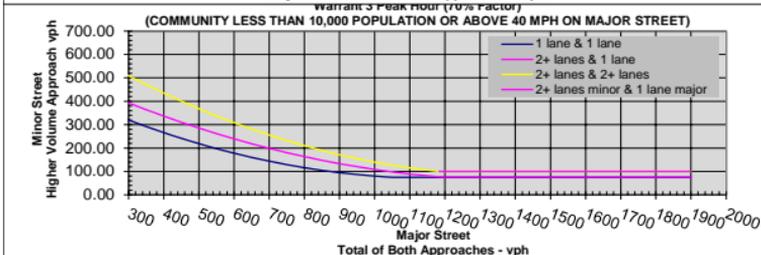
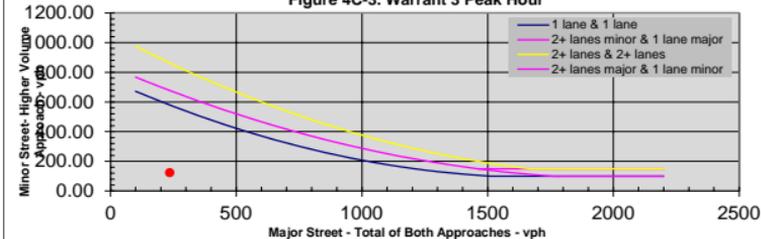
No

\*If applicable, attach all supporting calculations and documentation.

Are the requirements for Warrant 3 met?:

No

**Figure 4C-3. Warrant 3 Peak Hour**



| Hour Vehicular Volume      |   |   |  |   |
|----------------------------|---|---|--|---|
| Hour Interval Beginning At | Major Street Combined Vehicles Per Hour (VPH) | Highest Minor Street Approach Vehicles Per Hour (VPH) | Sum of Major Street and Highest Minor Street | Sum of Major Street and Combined Minor Street |
| 6:00 AM                    | 0   | 0   | 0  | 0   |
| 6:15 AM                    | 14  | 1   | 15   | 15  |
| 6:30 AM                    | 32  | 13  | 45   | 45  |
| 6:45 AM                    | 58  | 19  | 77   | 77  |
| 7:00 AM                    | 102   | 50  | 152  | 152   |
| 7:15 AM                    | 111   | 64  | 175  | 175   |
| 7:30 AM                    | 132   | 70  | 202  | 202   |
| 7:45 AM                    | 130   | 83  | 213  | 213   |
| 8:00 AM                    | 130   | 63  | 193  | 193   |
| 8:15 AM                    | 144   | 60  | 204  | 204   |
| 8:30 AM                    | 138   | 62  | 200  | 200   |
| 8:45 AM                    | 150   | 66  | 216  | 216   |
| 9:00 AM                    | 158   | 65  | 223  | 223   |
| 9:15 AM                    | 160   | 68  | 228  | 228   |
| 9:30 AM                    | 161   | 67  | 228  | 228   |
| 9:45 AM                    | 164   | 65  | 229  | 229   |
| 10:00 AM                   | 165   | 73  | 238  | 238   |
| 10:15 AM                   | 186   | 72  | 258  | 258   |
| 10:30 AM                   | 197   | 74  | 271  | 271   |
| 10:45 AM                   | 204   | 77  | 281  | 281   |
| 11:00 AM                   | 207   | 91  | 298  | 298   |
| 11:15 AM                   | 205   | 113   | 318  | 318   |
| 11:30 AM                   | 217   | 128   | 345  | 345   |
| 11:45 AM                   | 223   | 130   | 353  | 353   |
| 12:00 PM                   | 236   | 123   | 359  | 359   |
| 12:15 PM                   | 231   | 108   | 339  | 339   |
| 12:30 PM                   | 217   | 90  | 307  | 307   |
| 12:45 PM                   | 214   | 87  | 301  | 301   |
| 1:00 PM                    | 192   | 83  | 275  | 275   |
| 1:15 PM                    | 198   | 81  | 279  | 279   |
| 1:30 PM                    | 205   | 84  | 289  | 289   |
| 1:45 PM                    | 203   | 101   | 304  | 304   |
| 2:00 PM                    | 207   | 114   | 321  | 321   |
| 2:15 PM                    | 197   | 115   | 312  | 312   |
| 2:30 PM                    | 189   | 116   | 305  | 305   |
| 2:45 PM                    | 187   | 102   | 289  | 289   |
| 3:00 PM                    | 188   | 87  | 275  | 275   |
| 3:15 PM                    | 191   | 97  | 288  | 288   |
| 3:30 PM                    | 195   | 97  | 292  | 292   |
| 3:45 PM                    | 198   | 100   | 298  | 298   |
| 4:00 PM                    | 171   | 97  | 268  | 268   |
| 4:15 PM                    | 157   | 86  | 243  | 243   |
| 4:30 PM                    | 140   | 82  | 222  | 222   |
| 4:45 PM                    | 128   | 73  | 201  | 201   |
| 5:00 PM                    | 134   | 70  | 204  | 204   |
| 5:15 PM                    | 122   | 64  | 186  | 186   |
| 5:30 PM                    | 121   | 62  | 183  | 183   |
| 5:45 PM                    | 106   | 52  | 158  | 158   |
| 6:00 PM                    | 108   | 51  | 159  | 160   |
| 6:15 PM                    | 82  | 39  | 121  | 122   |
| 6:30 PM                    | 64  | 25  | 79   | 80  |
| 6:45 PM                    | 33  | 14  | 47   | 48  |
| 7:00 PM                    | 0   | 0   | 0  | 0   |
| 7:15 PM                    | 0   | 0   | 0  | 0   |
| 7:30 PM                    | 0   | 0   | 0  | 0   |
| 7:45 PM                    | 0   | 0   | 0  | 0   |
| 8:00 PM                    | 0   | 0   | 0  | 0   |

| Actual Peak Hour Major Traffic Volume | Actual Peak Hour Minor Traffic Volume | Required Peak Hour Minor Traffic Volume for Fig. 4C-3 | Required Peak Hour Minor Traffic Volume for Fig. 4C-4 |
|---------------------------------------|---------------------------------------|---|---|
| 236                                   | 123                                   | 580   | 358   |

## OMUTCD WARRANT 4, PEDESTRIAN VOLUME

| Hour Interval<br>Beginning At | Major Street<br>Combined<br>Vehicles Per<br>Hour (VPH) | Total of All<br>Pedestrians<br>Crossing Major<br>Street<br>Pedestrians Per<br>Hour (PPH) |
|-------------------------------|--|--|
| 6:00 AM                       | 0  | 0  |
| 6:15 AM                       | 14   | 0  |
| 6:30 AM                       | 32   | 0  |
| 6:45 AM                       | 58   | 1  |
| 7:00 AM                       | 102  | 2  |
| 7:15 AM                       | 111  | 3  |
| 7:30 AM                       | 132  | 5  |
| 7:45 AM                       | 130  | 5  |
| 8:00 AM                       | 130  | 5  |
| 8:15 AM                       | 144  | 7  |
| 8:30 AM                       | 138  | 7  |
| 8:45 AM                       | 150  | 8  |
| 9:00 AM                       | 158  | 11   |
| 9:15 AM                       | 160  | 17   |
| 9:30 AM                       | 161  | 16   |
| 9:45 AM                       | 164  | 17   |
| 10:00 AM                      | 165  | 15   |
| 10:15 AM                      | 186  | 7  |
| 10:30 AM                      | 197  | 8  |
| 10:45 AM                      | 204  | 8  |
| 11:00 AM                      | 207  | 9  |
| 11:15 AM                      | 205  | 9  |
| 11:30 AM                      | 217  | 14   |
| 11:45 AM                      | 223  | 12   |
| 12:00 PM                      | 236  | 14   |
| 12:15 PM                      | 231  | 15   |
| 12:30 PM                      | 217  | 10   |
| 12:45 PM                      | 214  | 13   |
| 1:00 PM                       | 192  | 9  |
| 1:15 PM                       | 188  | 7  |
| 1:30 PM                       | 205  | 6  |
| 1:45 PM                       | 203  | 5  |
| 2:00 PM                       | 207  | 7  |
| 2:15 PM                       | 197  | 8  |
| 2:30 PM                       | 189  | 9  |
| 2:45 PM                       | 187  | 7  |
| 3:00 PM                       | 188  | 12   |
| 3:15 PM                       | 191  | 13   |
| 3:30 PM                       | 195  | 14   |
| 3:45 PM                       | 198  | 18   |
| 4:00 PM                       | 171  | 12   |
| 4:15 PM                       | 157  | 11   |
| 4:30 PM                       | 140  | 11   |
| 4:45 PM                       | 128  | 11   |
| 5:00 PM                       | 134  | 12   |
| 5:15 PM                       | 122  | 13   |
| 5:30 PM                       | 121  | 15   |
| 5:45 PM                       | 106  | 11   |
| 6:00 PM                       | 108  | 9  |
| 6:15 PM                       | 82   | 7  |
| 6:30 PM                       | 54   | 2  |
| 6:45 PM                       | 33   | 1  |
| 7:00 PM                       | 0  | 0  |
| 7:15 PM                       | 0  | 0  |
| 7:30 PM                       | 0  | 0  |
| 7:45 PM                       | 0  | 0  |
| 8:00 PM                       | 0  | 0  |

**Built-up Isolated Community With Less Than 10,000 Population or Above 35 MPH on Major Street?** No

**15th Percentile Pedestrian Crossing Speed Less than 3.5 f/s?\*** No  
*\*If applicable, attach all supporting calculations, documentation, and findings.*

If 15th Percentile Pedestrian Crossing Speed is Less than 3.5 f/s,  
Reduce Criterion by (up to 50%):

**Is the distance to the nearest traffic control signal or STOP sign controlling the major street that pedestrians desire to cross less than 300 feet?** No

If the distance to the nearest traffic control signal or STOP sign controlling the major street that pedestrians desire to cross is less than 300 feet, will the proposed traffic control signal restrict the progressive movement of traffic? If applicable, attach supporting justification.

**Does the intersection meet the 4-Hour Volume?** No

**Does the intersection meet the Peak Hour?** No

**Are the Requirements for Warrant 4 Satisfied?** No

| Top Hours for Figure 4C-5 | Start Time | End Time | Vehicles | Pedestrians |
|---------------------------|------------|----------|----------|-------------|
| Top Hour                  | 12:00 PM   | 1:00 PM  | 236      | 14          |
| 2nd Highest Hour          | 1:15 PM    | 2:15 PM  | 198      | 18          |
| 3rd Highest Hour          | 11:00 AM   | 12:00 PM | 207      | 9           |
| 4th Highest Hour          | 11:00 AM   | 12:00 PM | 207      | 7           |

| Top Hours for Figure 4C-6 | Start Time | End Time | Vehicles | Pedestrians |
|---------------------------|------------|----------|----------|-------------|
| Top Hour                  | 12:00 PM   | 1:00 PM  | 236      | 14          |
| 2nd Highest Hour          | 1:15 PM    | 2:15 PM  | 198      | 18          |
| 3rd Highest Hour          | 11:00 AM   | 12:00 PM | 207      | 9           |
| 4th Highest Hour          | 11:00 AM   | 12:00 PM | 207      | 7           |

Peak Hour Used for Graphs 4C-7 & 4C-8

Top Hour

| Start Time | End Time | Vehicles | Pedestrians |
|------------|----------|----------|-------------|
| 12:00 PM   | 1:00 PM  | 236      | 14          |

Number of Hours That Met the 4-Hour Criteria 4C-5 0

Number of Hours That Met the 4-Hour Criteria 4C-6 0

Figure 4C-5. Warrant 4, Pedestrians Four-Hour Volume

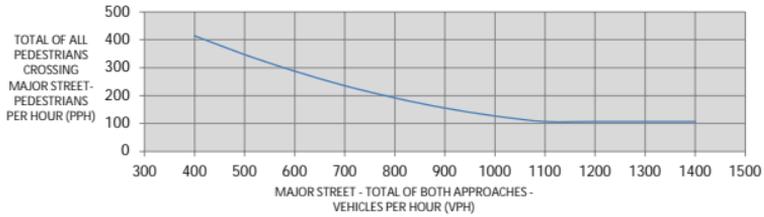


Figure 4C-6. Warrant 4, Pedestrian Four Hour Volume (70% Factor)

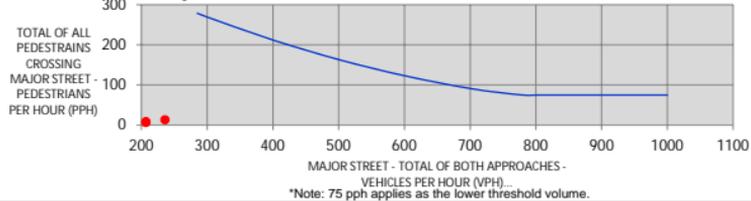


Figure 4C-7. Warrant 4, Pedestrian Peak Hour

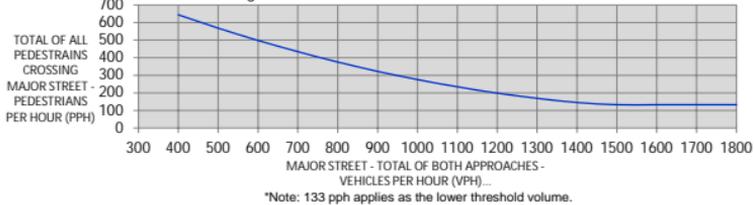
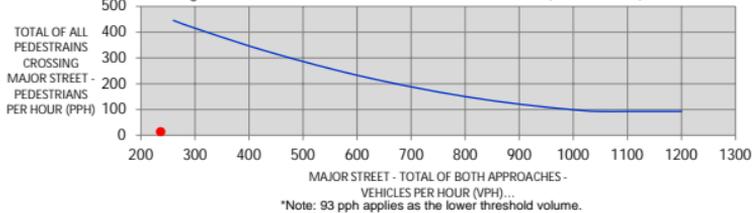


Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



## STUDY AND ANALYSIS INFORMATION

|                                   |                     |  |                         |
|-----------------------------------|---------------------|--|-------------------------|
| <b>Municipality:</b>              | Stubenville         | <b>Traffic Volumes Obtained By:</b>                      | Smart Services          |
| <b>County:</b>                    | Jefferson           | <b>Analysis Date:</b>                                    | 11/7/2024               |
| <b>ODOT Engineering District:</b> | 11                  | <b>Agency/ Company Name Performing Warrant Analysis:</b> | Strand Associates, Inc. |
| <b>Google map link:</b>           | <a href="#">Map</a> |  |                         |

### Analysis Information

**Data Collection Date:** 9/10/2024  
**Day of the Week:** Tuesday

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Existing Traffic Signal at intersection: Yes

Total Number of Approaches at Intersection: 4

### Major Street Information

Major Street Name and Route Number: Market St

Major Street Approach Direction: E-Bound  
W-Bound

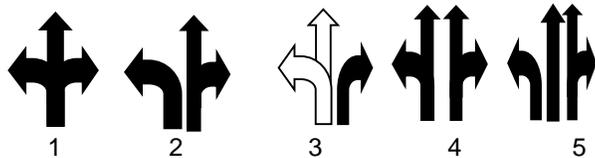
Number of Thru Lanes on Each Major Street Approach: 1 LANE(S)

Speed Limit or 85th Percentile Speed on the Major Street\*: 25 MPH  
\*Unknown assumes below 45 mph

### Minor Street Information

Minor Street Name and Route Number: 7th St

Minor Street Approach Configuration: 1 N-Bound  
1 S-Bound



Number of Thru Lanes on Each Minor Street Approach: 1 LANE(S)  
 Apply Right Turn Lane Reduction\*: Yes

\*Right Turn Lane Reduction Shall be used for Warrants 1, 2, & 3 for New ODOT Signals. Please refer to TEM 402-3.2 for clarification and criteria under which Right Turn Reduction is not required.

## TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

|  | Warrant     |            | Notes and Comments:  |                  |          |         |
|--|-------------|------------|--|------------------|----------|---------|
|  | Applicable? | Satisfied? |  |                  |          |         |
| <b>Warrant 1, Eight-Hour Vehicular Volume</b>  | Yes         | No         |  |                  |          |         |
| <b>Warrant 2, Four-Hour Vehicular Volume</b>   | Yes         | No         |  |                  |          |         |
| <b>Warrant 3, Peak Hour</b>  | Yes         | No         | Signals installed under Warrant 3 should be traffic actuated. <table border="1" style="float: right; margin-top: 5px;"> <tr><td style="text-align: center;"><b>Peak Hour</b></td></tr> <tr><td style="text-align: center;">2:30 PM</td></tr> <tr><td style="text-align: center;">3:30 PM</td></tr> </table>  | <b>Peak Hour</b> | 2:30 PM  | 3:30 PM |
| <b>Peak Hour</b>   |             |            |  |                  |          |         |
| 2:30 PM  |             |            |  |                  |          |         |
| 3:30 PM  |             |            |  |                  |          |         |
| For Warrants 1-3, new ODOT signals must be based off of 100% volume thresholds (TEM 402-3.2) |             |            |  |                  |          |         |
| <b>Warrant 4, Pedestrian Volume</b>  | Yes         | No         | If this warrant is met, and a traffic control signal is justified by an engineering study, the traffic control signal shall be equipped with pedestrian signal heads complying with the provisions set forth in Chapter 4E of the OMUTCD. <table border="1" style="float: right; margin-top: 5px;"> <tr><td style="text-align: center;"><b>Peak Hour</b></td></tr> <tr><td style="text-align: center;">12:00 PM</td></tr> <tr><td style="text-align: center;">1:00 PM</td></tr> </table> | <b>Peak Hour</b> | 12:00 PM | 1:00 PM |
| <b>Peak Hour</b>   |             |            |  |                  |          |         |
| 12:00 PM   |             |            |  |                  |          |         |
| 1:00 PM  |             |            |  |                  |          |         |
| <b>Warrant 5, School Crossing</b>  | No          |            | N/A  |                  |          |         |
| <b>Warrant 6, Coordinated Signal System</b>  | No          |            | (Shall not be used as the sole warrant in the analysis)  |                  |          |         |
| <b>Warrant 7, Crash Experience</b>   | No          |            | If this is the sole warrant, signal must be semi-actuated with control devices which provide proper coordination if installed at an intersection within a coordinated system and normally should be fully traffic actuated if installed at an isolated intersection.   |                  |          |         |
| <b>Warrant 8, Roadway Network</b>  | No          |            | (Shall not be used as the sole warrant in the analysis)  |                  |          |         |
| <b>Warrant 9, Intersection Near a Grade Crossing</b>   | No          |            | Figure 4C-9  |                  |          |         |
| <b>Multi-Way Stop Warrant</b>  | Yes         | Yes        | May be used as an interim measure if traffic signal warrants are satisfied.  |                  |          |         |

**The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.**

If no warrants are satisfied, additional options may be considered:

1. An engineering study, performed by a firm prequalified by ODOT for signal design, if approved by the ODOT district, may be used to justify a new signal installation or retention of an existing signal that otherwise does not meet the published warrants. An example of such an instance is a traffic signal in proximity to a railroad crossing that serves to reduce queuing across the tracks.

2. According to TEM 402-2, If the actual turning movement counts fail to satisfy a signal warrant, it may be acceptable to use traffic volumes projected to the second year after project completion. The **Modeling and Forecasting Section** should provide the projected traffic volumes.

3. A pedestrian hybrid beacon may be considered for installation to facilitate pedestrian crossings at a location that does not meet traffic signal warrants (see Chapter 4C of TEM) or at a location that meets traffic signal warrants under Sections 4C.05 and/or 4C.06 but a decision is made to not install a traffic control signal. **Please fill inputs on PHB Score Sheet and submit to ODOT.**

Considerations such as geometrics and lack of sight distance generally have not been accepted in lieu of satisfying signal warrants. These considerations may allow an otherwise unwarranted traffic signal to be retained at **100 percent** local cost. Please review TEM 402-4 for details.

Conclusion: **Do Not Retain Existing Traffic Signal**

Notes:

## OMUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

**Number of Lanes for Moving Traffic on Each Approach**

|                      |        |
|----------------------|--------|
| <b>Major Street:</b> | 1 Lane |
| <b>Minor Street:</b> | 1 Lane |

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? No

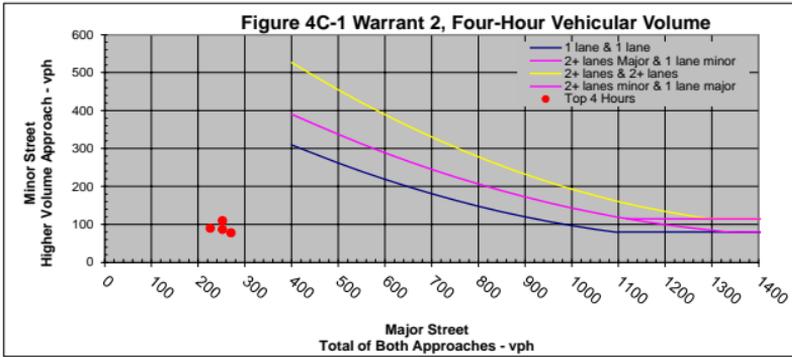
*\*Only applicable after an adequate trial of other alternatives (See section 4C.02.06 of the 2012 OMUTCD)*

| Lanes Major/Minor | Adjusted Volumes |       | Condition A |      |      |      | Condition B |      |      |      | Combination A/B* |      |      |      |      |      |      |      |
|-------------------|------------------|-------|-------------|------|------|------|-------------|------|------|------|------------------|------|------|------|------|------|------|------|
|                   |                  |       | 100%        |      | 70%  |      | 100%        |      | 70%  |      | 80%              |      | 80%  |      | 56%  |      | 56%  |      |
|                   | Major            | Minor | Maj.        | Min. | Maj. | Min. | Maj.        | Min. | Maj. | Min. | Maj.             | Min. | Maj. | Min. | Maj. | Min. | Maj. | Min. |
| 1 / 1             | X                |       | 500         | 150  | 350  | 105  | 750         | 75   | 525  | 53   | 400              | 120  | 600  | 60   | 280  | 84   | 420  | 42   |
| 2+ / 1            |                  |       | 600         | 150  | 420  | 105  | 900         | 75   | 630  | 53   | 480              | 120  | 720  | 60   | 336  | 84   | 504  | 42   |
| 2+ / 2+           |                  |       | 600         | 200  | 420  | 140  | 900         | 100  | 630  | 70   | 480              | 160  | 720  | 80   | 336  | 112  | 504  | 56   |
| 1 / 2+            |                  |       | 500         | 200  | 350  | 140  | 750         | 100  | 525  | 70   | 400              | 160  | 600  | 80   | 280  | 112  | 420  | 56   |
| 12:00 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:15 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:30 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:45 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:15 AM           | 22               | 11    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:30 AM           | 47               | 25    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:45 AM           | 91               | 51    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:00 AM           | 152              | 70    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:15 AM           | 159              | 84    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:30 AM           | 183              | 94    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:45 AM           | 190              | 106   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:00 AM           | 171              | 117   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:15 AM           | 182              | 103   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:30 AM           | 166              | 92    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:45 AM           | 165              | 67    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:00 AM           | 162              | 54    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:15 AM           | 167              | 61    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:30 AM           | 172              | 54    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:45 AM           | 183              | 67    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:00 AM          | 188              | 63    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:15 AM          | 199              | 63    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |



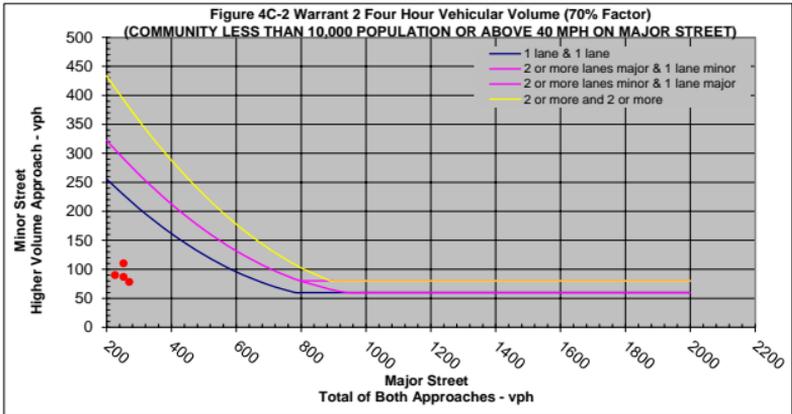
## OMUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

| Number of Lanes for Moving Traffic on Each Approach   |                    | Total Number of Unique Hours Met on Figure 4C-1              |                   |         |                              | 0  |           |                        |
|---|--------------------|--|-------------------|---------|------------------------------|--|-----------|------------------------|
| Major street: 1 Lane  |                    | Total Number of Unique Hours Met on Figure 4C-2 (70% Factor) |                   |         |                              | 0  |           |                        |
| Minor Street: 1 Lane  |                    |  |                   |         |                              |  |           |                        |
| Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? |                    |  |                   |         |                              |  |           |                        |
| No  |                    |  |                   |         |                              |  |           |                        |
| Hour Interval Beginning At  | Raw Traffic Counts |  |                   |         | Total Major Approach Volumes | Highest Actual Minor Street Approach Volumes | Hour Met? | Hour Met? (70% Factor) |
|   | Minor - 7th St     |  | Major - Market St |         |                              |  |           |                        |
|   | N-Bound            | S-Bound  | W-Bound           | E-Bound |                              |  |           |                        |
| 6:00 AM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |
| 6:15 AM   | 9                  | 11   | 4                 | 18      | 22                           | 11   |           |                        |
| 6:30 AM   | 15                 | 25   | 6                 | 41      | 47                           | 25   |           |                        |
| 6:45 AM   | 26                 | 51   | 14                | 77      | 91                           | 51   |           |                        |
| 7:00 AM   | 38                 | 70   | 21                | 131     | 152                          | 70   |           |                        |
| 7:15 AM   | 43                 | 84   | 25                | 134     | 159                          | 84   |           |                        |
| 7:30 AM   | 52                 | 94   | 31                | 152     | 183                          | 94   |           |                        |
| 7:45 AM   | 62                 | 106  | 35                | 145     | 180                          | 106  |           |                        |
| 8:00 AM   | 85                 | 117  | 40                | 131     | 174                          | 117  |           |                        |
| 8:15 AM   | 63                 | 103  | 40                | 142     | 182                          | 103  |           |                        |
| 8:30 AM   | 58                 | 92   | 38                | 128     | 166                          | 92   |           |                        |
| 8:45 AM   | 47                 | 67   | 32                | 133     | 165                          | 67   |           |                        |
| 9:00 AM   | 38                 | 54   | 30                | 132     | 162                          | 54   |           |                        |
| 9:15 AM   | 40                 | 61   | 37                | 130     | 167                          | 61   |           |                        |
| 9:30 AM   | 42                 | 64   | 45                | 127     | 172                          | 64   |           |                        |
| 9:45 AM   | 49                 | 67   | 58                | 125     | 183                          | 67   |           |                        |
| 10:00 AM  | 51                 | 63   | 55                | 133     | 188                          | 63   |           |                        |
| 10:15 AM  | 56                 | 63   | 49                | 150     | 199                          | 63   |           |                        |
| 10:30 AM  | 56                 | 75   | 52                | 152     | 204                          | 75   |           |                        |
| 10:45 AM  | 51                 | 80   | 50                | 154     | 204                          | 80   |           |                        |
| 11:00 AM  | 59                 | 82   | 59                | 146     | 205                          | 82   |           |                        |
| 11:15 AM  | 56                 | 79   | 68                | 150     | 218                          | 79   |           |                        |
| 11:30 AM  | 58                 | 67   | 74                | 172     | 246                          | 67   |           |                        |
| 11:45 AM  | 51                 | 75   | 80                | 183     | 263                          | 75   |           |                        |
| 12:00 PM  | 47                 | 78   | 83                | 187     | 270                          | 78   |           |                        |
| 12:15 PM  | 45                 | 78   | 76                | 183     | 259                          | 78   |           |                        |
| 12:30 PM  | 44                 | 78   | 64                | 175     | 239                          | 78   |           |                        |
| 12:45 PM  | 49                 | 74   | 55                | 173     | 228                          | 74   |           |                        |
| 1:00 PM   | 51                 | 74   | 49                | 173     | 222                          | 74   |           |                        |
| 1:15 PM   | 56                 | 81   | 54                | 169     | 223                          | 81   |           |                        |
| 1:30 PM   | 57                 | 90   | 55                | 171     | 226                          | 90   |           |                        |
| 1:45 PM   | 61                 | 98   | 53                | 174     | 227                          | 98   |           |                        |
| 2:00 PM   | 70                 | 106  | 52                | 188     | 240                          | 106  |           |                        |
| 2:15 PM   | 76                 | 114  | 57                | 185     | 242                          | 114  |           |                        |
| 2:30 PM   | 77                 | 110  | 64                | 188     | 252                          | 110  |           |                        |
| 2:45 PM   | 77                 | 102  | 68                | 184     | 252                          | 102  |           |                        |
| 3:00 PM   | 68                 | 89   | 66                | 177     | 243                          | 89   |           |                        |
| 3:15 PM   | 72                 | 82   | 67                | 184     | 251                          | 82   |           |                        |
| 3:30 PM   | 78                 | 87   | 60                | 186     | 246                          | 87   |           |                        |
| 3:45 PM   | 75                 | 87   | 67                | 185     | 252                          | 87   |           |                        |
| 4:00 PM   | 80                 | 94   | 78                | 180     | 238                          | 94   |           |                        |
| 4:15 PM   | 70                 | 89   | 63                | 154     | 217                          | 89   |           |                        |
| 4:30 PM   | 63                 | 85   | 68                | 149     | 217                          | 85   |           |                        |
| 4:45 PM   | 63                 | 78   | 57                | 144     | 201                          | 78   |           |                        |
| 5:00 PM   | 56                 | 72   | 45                | 139     | 184                          | 72   |           |                        |
| 5:15 PM   | 47                 | 72   | 47                | 132     | 179                          | 72   |           |                        |
| 5:30 PM   | 47                 | 63   | 39                | 121     | 160                          | 63   |           |                        |
| 5:45 PM   | 40                 | 67   | 30                | 107     | 137                          | 67   |           |                        |
| 6:00 PM   | 37                 | 67   | 30                | 119     | 149                          | 67   |           |                        |
| 6:15 PM   | 29                 | 48   | 21                | 85      | 106                          | 48   |           |                        |
| 6:30 PM   | 14                 | 36   | 12                | 54      | 66                           | 36   |           |                        |
| 6:45 PM   | 9                  | 14   | 8                 | 32      | 41                           | 14   |           |                        |
| 7:00 PM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |
| 7:15 PM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |
| 7:30 PM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |
| 7:45 PM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |
| 8:00 PM   | 0                  | 0  | 0                 | 0       | 0                            | 0  |           |                        |



| Top Hours for Figure 4C-1 |          | Start Time | End Time | Major Street | Minor Street |
|---------------------------|----------|------------|----------|--------------|--------------|
| Top Hour                  | 2:30 PM  | 3:30 PM    | 252      | 110          |              |
| 2nd Highest Hour          | 12:00 PM | 1:00 PM    | 270      | 78           |              |
| 3rd Highest Hour          | 3:45 PM  | 4:45 PM    | 252      | 87           |              |
| 4th Highest Hour          | 1:30 PM  | 2:30 PM    | 226      | 90           |              |

| Top Hours for Figure 4C-2 |          | Start Time | End Time | Major Street | Minor Street |
|---------------------------|----------|------------|----------|--------------|--------------|
| Top Hour                  | 2:30 PM  | 3:30 PM    | 252      | 110          |              |
| 2nd Highest Hour          | 12:00 PM | 1:00 PM    | 270      | 78           |              |
| 3rd Highest Hour          | 3:45 PM  | 4:45 PM    | 252      | 87           |              |
| 4th Highest Hour          | 1:30 PM  | 2:30 PM    | 226      | 90           |              |



Are the requirements for Warrant 2 met?:  No

### OMUTCD WARRANT 3, PEAK HOUR

|   |                      |         |
|---|----------------------|---------|
| Number of Lanes for Moving Traffic on Each Approach | Peak Hour Start time | 2:30 PM |
| Major Street: 1 Lane                                | Peak Hour End Time   | 3:30 PM |
| Minor Street: 1 Lane                                |                      |         |

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street?

No

Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?

No

**Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present\***

Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?

Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?

Yes

Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?

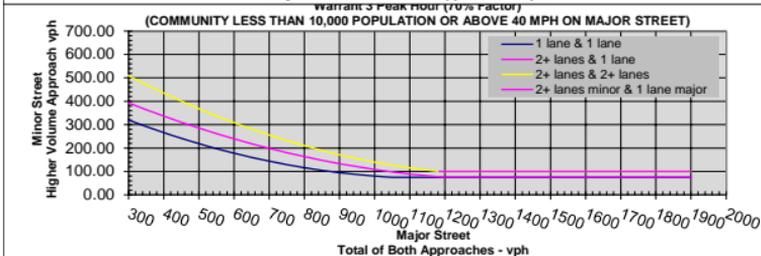
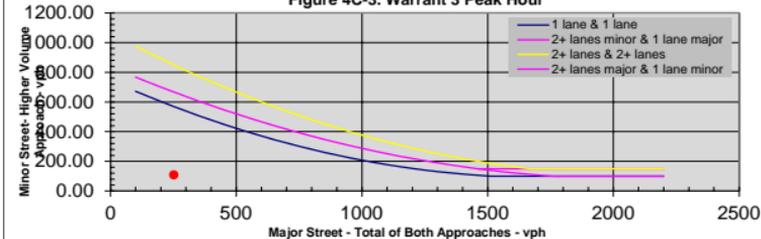
No

\*If applicable, attach all supporting calculations and documentation.

Are the requirements for Warrant 3 met?:

No

**Figure 4C-3. Warrant 3 Peak Hour**



| Hour Vehicular Volume      |   |   |  |   |
|----------------------------|---|---|--|---|
| Hour Interval Beginning At | Major Street Combined Vehicles Per Hour (VPH) | Highest Minor Street Approach Vehicles Per Hour (VPH) | Sum of Major Street and Highest Minor Street | Sum of Major Street and Combined Minor Street |
| 6:00 AM                    | 0   | 0   | 0  | 0   |
| 6:15 AM                    | 22  | 11  | 33   | 42  |
| 6:30 AM                    | 47  | 25  | 72   | 87  |
| 6:45 AM                    | 91  | 51  | 142  | 168   |
| 7:00 AM                    | 152   | 70  | 222  | 260   |
| 7:15 AM                    | 159   | 84  | 243  | 286   |
| 7:30 AM                    | 183   | 94  | 277  | 329   |
| 7:45 AM                    | 180   | 106   | 286  | 348   |
| 8:00 AM                    | 171   | 117   | 288  | 353   |
| 8:15 AM                    | 182   | 103   | 285  | 348   |
| 8:30 AM                    | 166   | 92  | 258  | 316   |
| 8:45 AM                    | 165   | 67  | 232  | 279   |
| 9:00 AM                    | 162   | 54  | 216  | 254   |
| 9:15 AM                    | 167   | 61  | 228  | 268   |
| 9:30 AM                    | 172   | 64  | 236  | 278   |
| 9:45 AM                    | 183   | 67  | 250  | 299   |
| 10:00 AM                   | 188   | 63  | 251  | 302   |
| 10:15 AM                   | 199   | 63  | 262  | 318   |
| 10:30 AM                   | 204   | 75  | 279  | 335   |
| 10:45 AM                   | 204   | 80  | 284  | 335   |
| 11:00 AM                   | 205   | 82  | 287  | 346   |
| 11:15 AM                   | 218   | 79  | 297  | 353   |
| 11:30 AM                   | 246   | 67  | 313  | 371   |
| 11:45 AM                   | 263   | 75  | 338  | 389   |
| 12:00 PM                   | 270   | 78  | 348  | 395   |
| 12:15 PM                   | 259   | 78  | 337  | 382   |
| 12:30 PM                   | 239   | 78  | 317  | 361   |
| 12:45 PM                   | 228   | 74  | 302  | 351   |
| 1:00 PM                    | 222   | 74  | 296  | 347   |
| 1:15 PM                    | 223   | 81  | 304  | 360   |
| 1:30 PM                    | 226   | 90  | 316  | 373   |
| 1:45 PM                    | 227   | 98  | 325  | 386   |
| 2:00 PM                    | 240   | 106   | 346  | 416   |
| 2:15 PM                    | 242   | 114   | 356  | 432   |
| 2:30 PM                    | 252   | 110   | 362  | 439   |
| 2:45 PM                    | 252   | 102   | 354  | 431   |
| 3:00 PM                    | 243   | 89  | 332  | 400   |
| 3:15 PM                    | 251   | 82  | 333  | 405   |
| 3:30 PM                    | 246   | 87  | 333  | 411   |
| 3:45 PM                    | 252   | 87  | 339  | 414   |
| 4:00 PM                    | 238   | 94  | 332  | 412   |
| 4:15 PM                    | 217   | 89  | 306  | 376   |
| 4:30 PM                    | 217   | 85  | 302  | 365   |
| 4:45 PM                    | 201   | 78  | 279  | 342   |
| 5:00 PM                    | 184   | 72  | 256  | 312   |
| 5:15 PM                    | 179   | 72  | 251  | 298   |
| 5:30 PM                    | 160   | 63  | 223  | 270   |
| 5:45 PM                    | 137   | 67  | 204  | 244   |
| 6:00 PM                    | 149   | 67  | 216  | 253   |
| 6:15 PM                    | 106   | 48  | 154  | 183   |
| 6:30 PM                    | 66  | 36  | 102  | 116   |
| 6:45 PM                    | 41  | 14  | 55   | 64  |
| 7:00 PM                    | 0   | 0   | 0  | 0   |
| 7:15 PM                    | 0   | 0   | 0  | 0   |
| 7:30 PM                    | 0   | 0   | 0  | 0   |
| 7:45 PM                    | 0   | 0   | 0  | 0   |
| 8:00 PM                    | 0   | 0   | 0  | 0   |

| Actual Peak Hour Major Traffic Volume | Actual Peak Hour Minor Traffic Volume | Required Peak Hour Minor Traffic Volume for Fig. 4C-3 | Required Peak Hour Minor Traffic Volume for Fig. 4C-4 |
|---------------------------------------|---------------------------------------|---|---|
| 252                                   | 110                                   | 569   | 348   |

## OMUTCD WARRANT 4, PEDESTRIAN VOLUME

| Hour Interval Beginning At | Major Street Combined Vehicles Per Hour (VPH) | Total of All Pedestrians Crossing Major Street Pedestrians Per Hour (PPH) |  |
|----------------------------|---|---|--|
| 6:00 AM                    | 0   | 0   | <b>Built-up Isolated Community With Less Than 10,000 Population or Above 35 MPH on Major Street?</b> <span style="float: right; background-color: #90EE90; padding: 2px;">No</span>  |
| 6:15 AM                    | 22  | 1   |  |
| 6:30 AM                    | 47  | 3   |  |
| 6:45 AM                    | 91  | 6   |  |
| 7:00 AM                    | 152   | 7   |  |
| 7:15 AM                    | 159   | 8   |  |
| 7:30 AM                    | 183   | 8   |  |
| 7:45 AM                    | 180   | 5   |  |
| 8:00 AM                    | 171   | 6   |  |
| 8:15 AM                    | 182   | 5   |  |
| 8:30 AM                    | 186   | 3   |  |
| 8:45 AM                    | 165   | 3   |  |
| 9:00 AM                    | 162   | 2   |  |
| 9:15 AM                    | 167   | 4   |  |
| 9:30 AM                    | 172   | 5   |  |
| 9:45 AM                    | 183   | 8   | <b>15th Percentile Pedestrian Crossing Speed Less than 3.5 f/s?*</b> <span style="float: right; background-color: #90EE90; padding: 2px;">No</span><br><i>*If applicable, attach all supporting calculations, documentation, and findings.</i> |
| 10:00 AM                   | 188   | 7   |  |
| 10:15 AM                   | 199   | 6   |  |
| 10:30 AM                   | 204   | 6   |  |
| 10:45 AM                   | 204   | 6   |  |
| 11:00 AM                   | 205   | 6   |  |
| 11:15 AM                   | 218   | 4   |  |
| 11:30 AM                   | 246   | 3   |  |
| 11:45 AM                   | 263   | 2   |  |
| 12:00 PM                   | 270   | 2   |  |
| 12:15 PM                   | 259   | 5   |  |
| 12:30 PM                   | 239   | 6   |  |
| 12:45 PM                   | 228   | 6   |  |
| 1:00 PM                    | 222   | 9   |  |
| 1:15 PM                    | 223   | 6   |  |
| 1:30 PM                    | 226   | 7   |  |
| 1:45 PM                    | 227   | 10  |  |
| 2:00 PM                    | 240   | 7   |  |
| 2:15 PM                    | 242   | 11  |  |
| 2:30 PM                    | 252   | 9   |  |
| 2:45 PM                    | 252   | 6   |  |
| 3:00 PM                    | 243   | 6   |  |
| 3:15 PM                    | 251   | 6   |  |
| 3:30 PM                    | 246   | 5   |  |
| 3:45 PM                    | 252   | 6   |  |
| 4:00 PM                    | 238   | 6   |  |
| 4:15 PM                    | 217   | 4   |  |
| 4:30 PM                    | 217   | 7   |  |
| 4:45 PM                    | 201   | 10  |  |
| 5:00 PM                    | 184   | 13  |  |
| 5:15 PM                    | 179   | 12  |  |
| 5:30 PM                    | 160   | 9   |  |
| 5:45 PM                    | 137   | 4   |  |
| 6:00 PM                    | 149   | 4   |  |
| 6:15 PM                    | 106   | 3   |  |
| 6:30 PM                    | 66  | 3   |  |
| 6:45 PM                    | 41  | 3   |  |
| 7:00 PM                    | 0   | 0   |  |
| 7:15 PM                    | 0   | 0   |  |
| 7:30 PM                    | 0   | 0   |  |
| 7:45 PM                    | 0   | 0   |  |
| 8:00 PM                    | 0   | 0   |  |

| Top Hours for Figure 4C-5 | Start Time | End Time | Vehicles | Pedestrians |
|---------------------------|------------|----------|----------|-------------|
| Top Hour                  | 12:00 PM   | 1:00 PM  | 270      | 2           |
| 2nd Highest Hour          | 2:30 PM    | 3:30 PM  | 252      | 9           |
| 3rd Highest Hour          | 2:30 PM    | 3:30 PM  | 252      | 6           |
| 4th Highest Hour          | 1:30 PM    | 2:30 PM  | 226      | 7           |

| Top Hours for Figure 4C-6 | Start Time | End Time | Vehicles | Pedestrians |
|---------------------------|------------|----------|----------|-------------|
| Top Hour                  | 12:00 PM   | 1:00 PM  | 270      | 2           |
| 2nd Highest Hour          | 2:30 PM    | 3:30 PM  | 252      | 9           |
| 3rd Highest Hour          | 2:30 PM    | 3:30 PM  | 252      | 6           |
| 4th Highest Hour          | 1:30 PM    | 2:30 PM  | 226      | 7           |

| Peak Hour Used for Graphs 4C-7 & 4C-8 |          |          |             |  |
|---------------------------------------|----------|----------|-------------|--|
| Top Hour                              |          |          |             |  |
| Start Time                            | End Time | Vehicles | Pedestrians |  |
| 12:00 PM                              | 1:00 PM  | 270      | 2           |  |

|   |   |
|---|---|
| Number of Hours That Met the 4-Hour Criteria 4C-5 | 0 |
|---|---|

|   |   |
|---|---|
| Number of Hours That Met the 4-Hour Criteria 4C-6 | 0 |
|---|---|

Figure 4C-5. Warrant 4, Pedestrians Four-Hour Volume

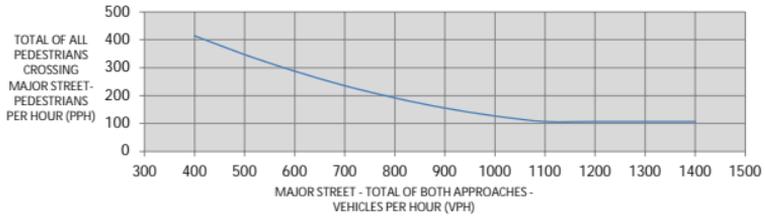


Figure 4C-6. Warrant 4, Pedestrian Four Hour Volume (70% Factor)

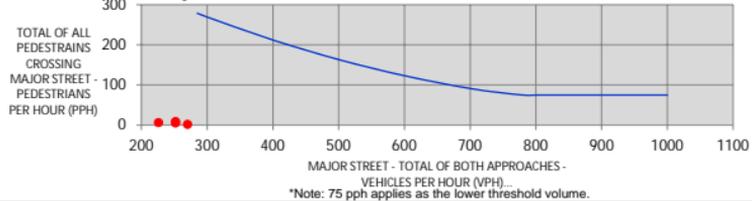


Figure 4C-7. Warrant 4, Pedestrian Peak Hour

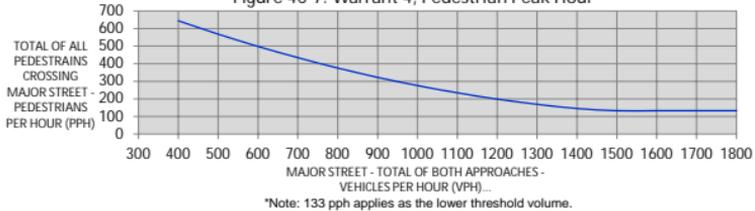
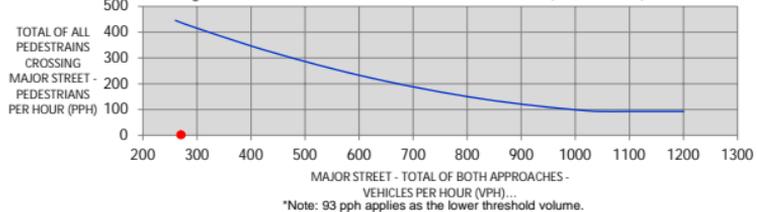


Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



## STUDY AND ANALYSIS INFORMATION

|                            |                     |   |                         |
|----------------------------|---------------------|---|-------------------------|
| Municipality:              | Stubenville         | Traffic Volumes Obtained By:                      | Smart Services          |
| County:                    | Jefferson           | Analysis Date:                                    | 11/6/2024               |
| ODOT Engineering District: | 11                  | Agency/ Company Name Performing Warrant Analysis: | Strand Associates, Inc. |
| Google map link:           | <a href="#">Map</a> |   |                         |

### Analysis Information

Data Collection Date: 9/10/2024  
 Day of the Week: Tuesday

Is the intersection in a built-up area of an isolated community of <10,000 population? Yes

Existing Traffic Signal at intersection: Yes

Total Number of Approaches at Intersection: 4

### Major Street Information

Major Street Name and Route Number: 4th St

Major Street Approach Direction: N-Bound  
S-Bound

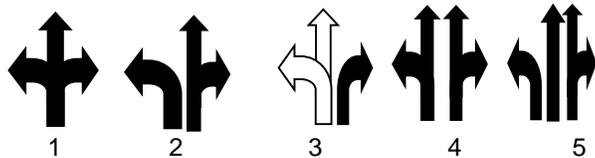
Number of Thru Lanes on Each Major Street Approach: 1 LANE(S)

Speed Limit or 85th Percentile Speed on the Major Street\*: 25 MPH  
\*Unknown assumes below 45 mph

### Minor Street Information

Minor Street Name and Route Number: North St

Minor Street Approach Configuration: 1 E-Bound  
1 W-Bound



Number of Thru Lanes on Each Minor Street Approach: 1 LANE(S)  
 Apply Right Turn Lane Reduction\*: Yes

\*Right Turn Lane Reduction Shall be used for Warrants 1, 2, & 3 for New ODOT Signals. Please refer to TEM 402-3.2 for clarification and criteria under which Right Turn Reduction is not required.

**TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS**

|  | Warrant     |            | Notes and Comments:  |           |         |         |
|--|-------------|------------|--|-----------|---------|---------|
|  | Applicable? | Satisfied? |  |           |         |         |
| Warrant 1, Eight-Hour Vehicular Volume   | Yes         | No         |  |           |         |         |
| Warrant 2, Four-Hour Vehicular Volume  | Yes         | No         |  |           |         |         |
| Warrant 3, Peak Hour   | Yes         | No         | Signals installed under Warrant 3 should be traffic actuated.<br><table border="1" style="float: right;"> <tr><td>Peak Hour</td></tr> <tr><td>2:15 PM</td></tr> <tr><td>3:15 PM</td></tr> </table>   | Peak Hour | 2:15 PM | 3:15 PM |
| Peak Hour  |             |            |  |           |         |         |
| 2:15 PM  |             |            |  |           |         |         |
| 3:15 PM  |             |            |  |           |         |         |
| For Warrants 1-3, new ODOT signals must be based off of 100% volume thresholds (TEM 402-3.2) |             |            |  |           |         |         |
| Warrant 4, Pedestrian Volume   | Yes         | No         | If this warrant is met, and a traffic control signal is justified by an engineering study, the traffic control signal shall be equipped with pedestrian signal heads complying with the provisions set forth in Chapter 4E of the OMUTCD.<br><table border="1" style="float: right;"> <tr><td>Peak Hour</td></tr> <tr><td>2:15 PM</td></tr> <tr><td>3:15 PM</td></tr> </table> | Peak Hour | 2:15 PM | 3:15 PM |
| Peak Hour  |             |            |  |           |         |         |
| 2:15 PM  |             |            |  |           |         |         |
| 3:15 PM  |             |            |  |           |         |         |
| Warrant 5, School Crossing   | No          |            | N/A  |           |         |         |
| Warrant 6, Coordinated Signal System   | No          |            | (Shall not be used as the sole warrant in the analysis)  |           |         |         |
| Warrant 7, Crash Experience  | No          |            | If this is the sole warrant, signal must be semi-actuated with control devices which provide proper coordination if installed at an intersection within a coordinated system and normally should be fully traffic actuated if installed at an isolated intersection.   |           |         |         |
| Warrant 8, Roadway Network   | No          |            | (Shall not be used as the sole warrant in the analysis)  |           |         |         |
| Warrant 9, Intersection Near a Grade Crossing  | No          |            | Figure 4C-9  |           |         |         |
| Multi-Way Stop Warrant   | Yes         | Yes        | May be used as an interim measure if traffic signal warrants are satisfied.  |           |         |         |

**The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.**

|   |
|---|
| If no warrants are satisfied, additional options may be considered:   |
| 1. An engineering study, performed by a firm prequalified by ODOT for signal design, if approved by the ODOT district, may be used to justify a new signal installation or retention of an existing signal that otherwise does not meet the published warrants. An example of such an instance is a traffic signal in proximity to a railroad crossing that serves to reduce queuing across the tracks.     |
| 2. According to TEM 402-2, If the actual turning movement counts fail to satisfy a signal warrant, it may be acceptable to use traffic volumes projected to the second year after project completion. The <b>Modeling and Forecasting Section</b> should provide the projected traffic volumes.   |
| 3. A pedestrian hybrid beacon may be considered for installation to facilitate pedestrian crossings at a location that does not meet traffic signal warrants (see Chapter 4C of TEM) or at a location that meets traffic signal warrants under Sections 4C.05 and/or 4C.06 but a decision is made to not install a traffic control signal. <b>Please fill inputs on PHB Score Sheet and submit to ODOT.</b> |

Considerations such as geometrics and lack of sight distance generally have not been accepted in lieu of satisfying signal warrants. These considerations may allow an otherwise unwarranted traffic signal to be retained at **100 percent** local cost. Please review TEM 402-4 for details.

Conclusion: **Do Not Retain Existing Traffic Signal**

Notes:

**OMUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME**

|  |        |
|--|--------|
| <b>Number of Lanes for Moving Traffic on Each Approach</b> |        |
| <b>Major Street:</b>                                       | 1 Lane |
| <b>Minor Street:</b>                                       | 1 Lane |

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? **Yes**

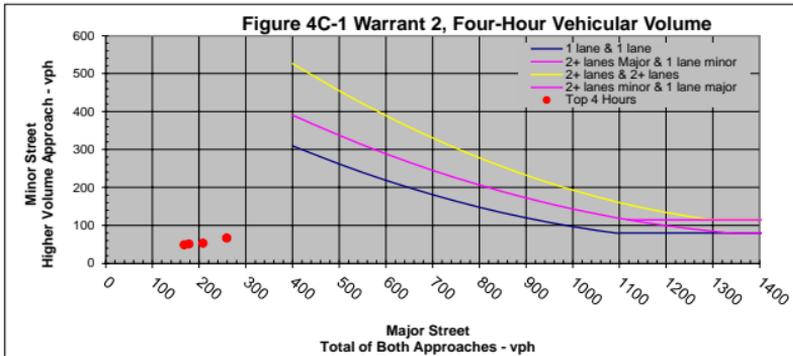
\*Only applicable after an adequate trial of other alternatives (See section 4C.02.06 of the 2012 OMUTCD)

| Lanes Major/Minor | Adjusted Volumes |       | Condition A |      |      |      | Condition B |      |      |      | Combination A/B* |      |      |      |      |      |      |      |
|-------------------|------------------|-------|-------------|------|------|------|-------------|------|------|------|------------------|------|------|------|------|------|------|------|
|                   | Major            | Minor | 100%        |      | 70%  |      | 100%        |      | 70%  |      | 80%              |      | 80%  |      | 56%  |      | 56%  |      |
|                   |                  |       | Maj.        | Min. | Maj. | Min. | Maj.        | Min. | Maj. | Min. | Maj.             | Min. | Maj. | Min. | Maj. | Min. | Maj. | Min. |
| 1 / 1             | X                |       | 500         | 150  | 350  | 105  | 750         | 75   | 525  | 53   | 400              | 120  | 600  | 60   | 280  | 84   | 420  | 42   |
| 2+ / 1            |                  |       | 600         | 150  | 420  | 105  | 900         | 75   | 630  | 53   | 480              | 120  | 720  | 60   | 336  | 84   | 504  | 42   |
| 2+ / 2+           |                  |       | 600         | 200  | 420  | 140  | 900         | 100  | 630  | 70   | 480              | 160  | 720  | 80   | 336  | 112  | 504  | 56   |
| 1 / 2+            |                  |       | 500         | 200  | 350  | 140  | 750         | 100  | 525  | 70   | 400              | 160  | 600  | 80   | 280  | 112  | 420  | 56   |
| 12:00 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:15 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:30 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:45 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:15 AM           | 27               | 5     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:30 AM           | 62               | 7     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:45 AM           | 108              | 19    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:00 AM           | 165              | 38    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:15 AM           | 171              | 40    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:30 AM           | 186              | 53    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:45 AM           | 208              | 53    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:00 AM           | 190              | 48    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:15 AM           | 189              | 44    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:30 AM           | 167              | 34    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:45 AM           | 125              | 26    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:00 AM           | 115              | 15    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:15 AM           | 111              | 22    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:30 AM           | 95               | 28    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:45 AM           | 106              | 27    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:00 AM          | 113              | 28    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:15 AM          | 124              | 30    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |



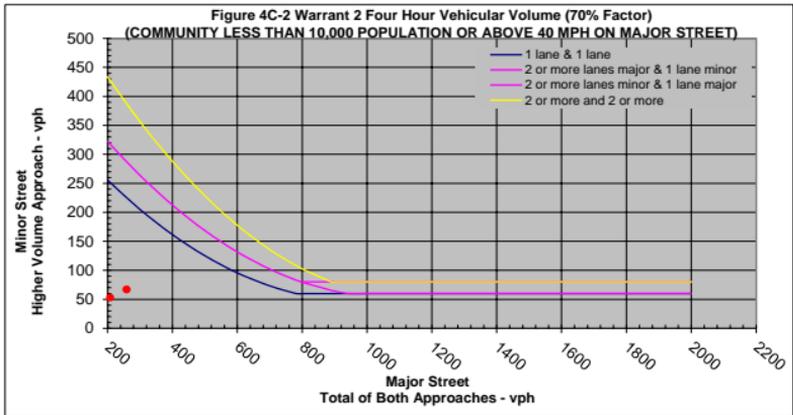
## OMUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

| Number of Lanes for Moving Traffic on Each Approach   |                    | Total Number of Unique Hours Met on Figure 4C-1              |                  |         |                              | 0  |           |                        |
|---|--------------------|--|------------------|---------|------------------------------|--|-----------|------------------------|
| Major street: 1 Lane  |                    | Total Number of Unique Hours Met on Figure 4C-2 (70% Factor) |                  |         |                              | 0  |           |                        |
| Minor Street: 1 Lane  |                    |  |                  |         |                              |  |           |                        |
| Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? |                    |  |                  |         |                              | Yes  |           |                        |
| Hour Interval Beginning At  | Raw Traffic Counts |  |                  |         | Total Major Approach Volumes | Highest Actual Minor Street Approach Volumes | Hour Met? | Hour Met? (70% Factor) |
|   | Major - 4th St     |  | Minor - North St |         |                              |  |           |                        |
|   | N-Bound            | S-Bound  | W-Bound          | E-Bound |                              |  |           |                        |
| 6:00 AM   | 0                  | 0  | 0                | 0       | 0                            | 0  |           |                        |
| 6:15 AM   | 18                 | 9  | 4                | 5       | 27                           | 5  |           |                        |
| 6:30 AM   | 39                 | 23   | 7                | 7       | 62                           | 7  |           |                        |
| 6:45 AM   | 68                 | 40   | 18               | 19      | 108                          | 19   |           |                        |
| 7:00 AM   | 109                | 56   | 38               | 30      | 165                          | 38   |           |                        |
| 7:15 AM   | 115                | 56   | 40               | 40      | 171                          | 40   |           |                        |
| 7:30 AM   | 133                | 53   | 53               | 50      | 186                          | 53   |           |                        |
| 7:45 AM   | 133                | 75   | 53               | 50      | 208                          | 53   |           |                        |
| 8:00 AM   | 113                | 77   | 48               | 44      | 190                          | 48   |           |                        |
| 8:15 AM   | 108                | 81   | 44               | 32      | 189                          | 44   |           |                        |
| 8:30 AM   | 84                 | 83   | 34               | 21      | 167                          | 34   |           |                        |
| 8:45 AM   | 69                 | 56   | 26               | 16      | 125                          | 26   |           |                        |
| 9:00 AM   | 63                 | 52   | 15               | 14      | 115                          | 15   |           |                        |
| 9:15 AM   | 58                 | 53   | 17               | 22      | 111                          | 22   |           |                        |
| 9:30 AM   | 48                 | 47   | 15               | 28      | 95                           | 28   |           |                        |
| 9:45 AM   | 52                 | 54   | 18               | 27      | 106                          | 27   |           |                        |
| 10:00 AM  | 52                 | 61   | 20               | 28      | 113                          | 28   |           |                        |
| 10:15 AM  | 62                 | 62   | 23               | 30      | 124                          | 30   |           |                        |
| 10:30 AM  | 75                 | 85   | 29               | 31      | 160                          | 31   |           |                        |
| 10:45 AM  | 79                 | 84   | 32               | 41      | 163                          | 41   |           |                        |
| 11:00 AM  | 89                 | 89   | 36               | 51      | 178                          | 51   |           |                        |
| 11:15 AM  | 95                 | 92   | 31               | 45      | 187                          | 45   |           |                        |
| 11:30 AM  | 96                 | 72   | 26               | 46      | 168                          | 46   |           |                        |
| 11:45 AM  | 90                 | 74   | 30               | 35      | 164                          | 35   |           |                        |
| 12:00 PM  | 91                 | 60   | 29               | 36      | 151                          | 36   |           |                        |
| 12:15 PM  | 82                 | 56   | 34               | 36      | 138                          | 36   |           |                        |
| 12:30 PM  | 73                 | 59   | 45               | 43      | 132                          | 45   |           |                        |
| 12:45 PM  | 81                 | 63   | 36               | 48      | 144                          | 48   |           |                        |
| 1:00 PM   | 82                 | 76   | 38               | 49      | 158                          | 49   |           |                        |
| 1:15 PM   | 83                 | 85   | 36               | 49      | 168                          | 49   |           |                        |
| 1:30 PM   | 105                | 85   | 35               | 46      | 191                          | 46   |           |                        |
| 1:45 PM   | 115                | 117  | 51               | 56      | 232                          | 56   |           |                        |
| 2:00 PM   | 127                | 115  | 60               | 57      | 242                          | 60   |           |                        |
| 2:15 PM   | 128                | 131  | 63               | 67      | 259                          | 67   |           |                        |
| 2:30 PM   | 112                | 132  | 64               | 62      | 244                          | 64   |           |                        |
| 2:45 PM   | 101                | 90   | 54               | 52      | 191                          | 54   |           |                        |
| 3:00 PM   | 86                 | 93   | 52               | 52      | 179                          | 52   |           |                        |
| 3:15 PM   | 83                 | 72   | 48               | 45      | 155                          | 48   |           |                        |
| 3:30 PM   | 82                 | 76   | 43               | 47      | 158                          | 47   |           |                        |
| 3:45 PM   | 82                 | 87   | 45               | 47      | 169                          | 47   |           |                        |
| 4:00 PM   | 77                 | 75   | 35               | 34      | 152                          | 35   |           |                        |
| 4:15 PM   | 76                 | 70   | 36               | 41      | 146                          | 41   |           |                        |
| 4:30 PM   | 79                 | 74   | 41               | 40      | 153                          | 41   |           |                        |
| 4:45 PM   | 68                 | 69   | 36               | 43      | 137                          | 43   |           |                        |
| 5:00 PM   | 58                 | 70   | 38               | 48      | 128                          | 48   |           |                        |
| 5:15 PM   | 49                 | 71   | 36               | 39      | 120                          | 39   |           |                        |
| 5:30 PM   | 41                 | 61   | 40               | 39      | 102                          | 40   |           |                        |
| 5:45 PM   | 40                 | 52   | 33               | 33      | 92                           | 33   |           |                        |
| 6:00 PM   | 48                 | 51   | 32               | 30      | 99                           | 32   |           |                        |
| 6:15 PM   | 38                 | 37   | 25               | 20      | 75                           | 25   |           |                        |
| 6:30 PM   | 28                 | 24   | 15               | 14      | 52                           | 15   |           |                        |
| 6:45 PM   | 17                 | 14   | 10               | 5       | 31                           | 10   |           |                        |
| 7:00 PM   | 0                  | 0  | 0                | 0       | 0                            | 0  |           |                        |
| 7:15 PM   | 0                  | 0  | 0                | 0       | 0                            | 0  |           |                        |
| 7:30 PM   | 0                  | 0  | 0                | 0       | 0                            | 0  |           |                        |
| 7:45 PM   | 0                  | 0  | 0                | 0       | 0                            | 0  |           |                        |
| 8:00 PM   | 0                  | 0  | 0                | 0       | 0                            | 0  |           |                        |



| Top Hours for Figure 4C-1 |            |          |              |              |
|---------------------------|------------|----------|--------------|--------------|
|                           | Start Time | End Time | Major Street | Minor Street |
| Top Hour                  | 2:15 PM    | 3:15 PM  | 259          | 67           |
| 2nd Highest Hour          | 7:45 AM    | 8:45 AM  | 208          | 53           |
| 3rd Highest Hour          | 11:00 AM   | 12:00 PM | 178          | 51           |
| 4th Highest Hour          | 1:15 PM    | 2:15 PM  | 168          | 49           |

| Top Hours for Figure 4C-2 |            |          |              |              |
|---------------------------|------------|----------|--------------|--------------|
|                           | Start Time | End Time | Major Street | Minor Street |
| Top Hour                  | 2:15 PM    | 3:15 PM  | 259          | 67           |
| 2nd Highest Hour          | 7:45 AM    | 8:45 AM  | 208          | 53           |
| 3rd Highest Hour          | 11:00 AM   | 12:00 PM | 178          | 51           |
| 4th Highest Hour          | 1:15 PM    | 2:15 PM  | 168          | 49           |



Are the requirements for Warrant 2 met?:  No

| OMUTCD WARRANT 3, PEAK HOUR                         |                      |         |
|---|----------------------|---------|
| Number of Lanes for Moving Traffic on Each Approach | Peak Hour Start time | 2:15 PM |
| Major Street: 1 Lane                                | Peak Hour End Time   | 3:15 PM |
| Minor Street: 1 Lane                                |                      |         |

|   |     |
|---|-----|
| Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? | Yes |
|---|-----|

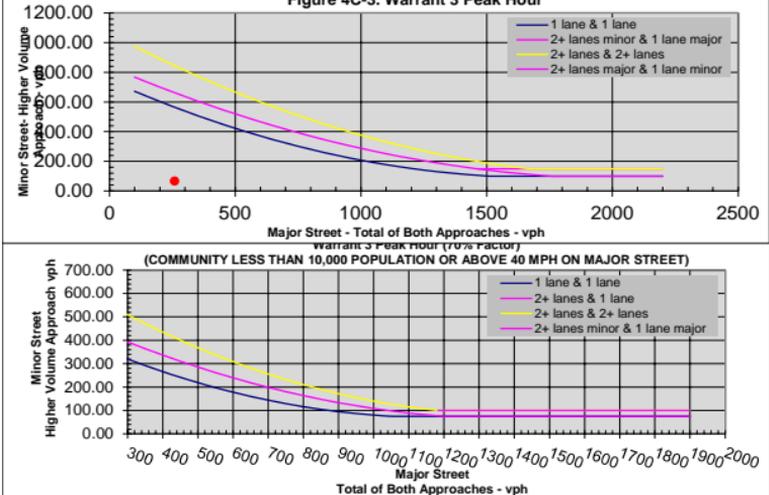
|   |    |
|---|----|
| Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time? | No |
|---|----|

| Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present*   |    |
|--|----|
| Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach? |    |
| Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?   | No |
| Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?                                | No |

\*If applicable, attach all supporting calculations and documentation.

|  |    |
|--|----|
| Are the requirements for Warrant 3 met?: | No |
|--|----|

Figure 4C-3. Warrant 3 Peak Hour



## Signal Warrant\_NorthSt&amp;4thSt

| Hour Vehicular Volume      |   |   |  |   |
|----------------------------|---|---|--|---|
| Hour Interval Beginning At | Major Street Combined Vehicles Per Hour (VPH) | Highest Minor Street Approach Vehicles Per Hour (VPH) | Sum of Major Street and Highest Minor Street | Sum of Major Street and Combined Minor Street |
| 6:00 AM                    | 0   | 0   | 0  | 0   |
| 6:15 AM                    | 27  | 5   | 32   | 36  |
| 6:30 AM                    | 62  | 7   | 69   | 76  |
| 6:45 AM                    | 108   | 19  | 127  | 145   |
| 7:00 AM                    | 165   | 38  | 203  | 233   |
| 7:15 AM                    | 171   | 40  | 211  | 251   |
| 7:30 AM                    | 186   | 53  | 239  | 289   |
| 7:45 AM                    | 208   | 53  | 261  | 311   |
| 8:00 AM                    | 190   | 48  | 238  | 282   |
| 8:15 AM                    | 189   | 44  | 233  | 265   |
| 8:30 AM                    | 167   | 34  | 201  | 222   |
| 8:45 AM                    | 125   | 26  | 151  | 167   |
| 9:00 AM                    | 115   | 15  | 130  | 144   |
| 9:15 AM                    | 111   | 22  | 133  | 150   |
| 9:30 AM                    | 95  | 28  | 123  | 138   |
| 9:45 AM                    | 106   | 27  | 133  | 151   |
| 10:00 AM                   | 113   | 28  | 141  | 161   |
| 10:15 AM                   | 124   | 30  | 154  | 177   |
| 10:30 AM                   | 160   | 31  | 191  | 220   |
| 10:45 AM                   | 163   | 41  | 204  | 236   |
| 11:00 AM                   | 178   | 51  | 229  | 265   |
| 11:15 AM                   | 187   | 45  | 232  | 263   |
| 11:30 AM                   | 168   | 48  | 214  | 240   |
| 11:45 AM                   | 164   | 35  | 199  | 229   |
| 12:00 PM                   | 151   | 38  | 187  | 216   |
| 12:15 PM                   | 138   | 38  | 174  | 208   |
| 12:30 PM                   | 132   | 45  | 177  | 220   |
| 12:45 PM                   | 144   | 48  | 192  | 228   |
| 1:00 PM                    | 158   | 49  | 207  | 245   |
| 1:15 PM                    | 168   | 49  | 217  | 253   |
| 1:30 PM                    | 191   | 46  | 237  | 272   |
| 1:45 PM                    | 232   | 56  | 288  | 339   |
| 2:00 PM                    | 242   | 60  | 302  | 359   |
| 2:15 PM                    | 259   | 67  | 326  | 389   |
| 2:30 PM                    | 244   | 64  | 308  | 370   |
| 2:45 PM                    | 191   | 54  | 245  | 297   |
| 3:00 PM                    | 179   | 52  | 231  | 283   |
| 3:15 PM                    | 155   | 48  | 203  | 248   |
| 3:30 PM                    | 158   | 47  | 205  | 248   |
| 3:45 PM                    | 169   | 47  | 216  | 261   |
| 4:00 PM                    | 152   | 35  | 187  | 221   |
| 4:15 PM                    | 146   | 41  | 187  | 223   |
| 4:30 PM                    | 153   | 41  | 194  | 234   |
| 4:45 PM                    | 137   | 43  | 180  | 216   |
| 5:00 PM                    | 128   | 48  | 176  | 214   |
| 5:15 PM                    | 120   | 39  | 159  | 195   |
| 5:30 PM                    | 102   | 40  | 142  | 181   |
| 5:45 PM                    | 92  | 33  | 125  | 158   |
| 6:00 PM                    | 99  | 32  | 131  | 161   |
| 6:15 PM                    | 75  | 25  | 100  | 120   |
| 6:30 PM                    | 62  | 15  | 67   | 81  |
| 6:45 PM                    | 31  | 10  | 41   | 46  |
| 7:00 PM                    | 0   | 0   | 0  | 0   |
| 7:15 PM                    | 0   | 0   | 0  | 0   |
| 7:30 PM                    | 0   | 0   | 0  | 0   |
| 7:45 PM                    | 0   | 0   | 0  | 0   |
| 8:00 PM                    | 0   | 0   | 0  | 0   |

| Actual Peak Hour Major Traffic Volume | Actual Peak Hour Minor Traffic Volume | Required Peak Hour Minor Traffic Volume for Fig. 4C-3 | Required Peak Hour Minor Traffic Volume for Fig. 4C-4 |
|---------------------------------------|---------------------------------------|---|---|
| 259                                   | 67                                    | 565   | 344   |

## OMUTCD WARRANT 4, PEDESTRIAN VOLUME

| Hour Interval Beginning At | Major Street Combined Vehicles Per Hour (VPH) | Total of All Pedestrians Crossing Major Street Pedestrians Per Hour (PPH) |  |
|----------------------------|---|---|--|
| 6:00 AM                    | 0   | 0   | <b>Built-up Isolated Community With Less Than 10,000 Population or Above 35 MPH on Major Street?</b> <span style="float: right; background-color: #e0f2f1; padding: 2px;">Yes</span>   |
| 6:15 AM                    | 27  | 0   |  |
| 6:30 AM                    | 62  | 1   |  |
| 6:45 AM                    | 108   | 1   |  |
| 7:00 AM                    | 165   | 1   |  |
| 7:15 AM                    | 171   | 1   |  |
| 7:30 AM                    | 186   | 4   |  |
| 7:45 AM                    | 208   | 4   |  |
| 8:00 AM                    | 180   | 6   |  |
| 8:15 AM                    | 189   | 9   |  |
| 8:30 AM                    | 187   | 6   |  |
| 8:45 AM                    | 125   | 6   |  |
| 9:00 AM                    | 115   | 8   |  |
| 9:15 AM                    | 111   | 5   |  |
| 9:30 AM                    | 95  | 4   |  |
| 9:45 AM                    | 106   | 8   |  |
| 10:00 AM                   | 113   | 4   |  |
| 10:15 AM                   | 124   | 4   |  |
| 10:30 AM                   | 160   | 6   |  |
| 10:45 AM                   | 163   | 4   |  |
| 11:00 AM                   | 178   | 6   |  |
| 11:15 AM                   | 187   | 9   |  |
| 11:30 AM                   | 168   | 7   |  |
| 11:45 AM                   | 164   | 6   |  |
| 12:00 PM                   | 151   | 4   |  |
| 12:15 PM                   | 138   | 1   |  |
| 12:30 PM                   | 132   | 2   |  |
| 12:45 PM                   | 144   | 1   |  |
| 1:00 PM                    | 158   | 1   | <b>15th Percentile Pedestrian Crossing Speed Less than 3.5 f/s?*</b> <span style="float: right; background-color: #e0f2f1; padding: 2px;">No</span><br><i>*If applicable, attach all supporting calculations, documentation, and findings.</i> |
| 1:15 PM                    | 168   | 2   |  |
| 1:30 PM                    | 191   | 2   |  |
| 1:45 PM                    | 232   | 5   |  |
| 2:00 PM                    | 242   | 7   |  |
| 2:15 PM                    | 259   | 6   |  |
| 2:30 PM                    | 244   | 6   |  |
| 2:45 PM                    | 191   | 3   |  |
| 3:00 PM                    | 179   | 3   |  |
| 3:15 PM                    | 155   | 3   |  |
| 3:30 PM                    | 158   | 3   |  |
| 3:45 PM                    | 169   | 3   |  |
| 4:00 PM                    | 152   | 1   |  |
| 4:15 PM                    | 146   | 1   |  |
| 4:30 PM                    | 153   | 0   |  |
| 4:45 PM                    | 137   | 0   |  |
| 5:00 PM                    | 128   | 0   |  |
| 5:15 PM                    | 120   | 0   |  |
| 5:30 PM                    | 102   | 0   |  |
| 5:45 PM                    | 92  | 1   |  |
| 6:00 PM                    | 99  | 1   |  |
| 6:15 PM                    | 75  | 1   |  |
| 6:30 PM                    | 52  | 1   |  |
| 6:45 PM                    | 31  | 0   |  |
| 7:00 PM                    | 0   | 0   |  |
| 7:15 PM                    | 0   | 0   |  |
| 7:30 PM                    | 0   | 0   |  |
| 7:45 PM                    | 0   | 0   |  |
| 8:00 PM                    | 0   | 0   |  |

| Top Hours for Figure 4C-5 | Start Time | End Time | Vehicles | Pedestrians |
|---------------------------|------------|----------|----------|-------------|
| Top Hour                  | 2:15 PM    | 3:15 PM  | 259      | 6           |
| 2nd Highest Hour          | 7:45 AM    | 8:45 AM  | 208      | 4           |
| 3rd Highest Hour          | 11:15 AM   | 12:15 PM | 187      | 9           |
| 4th Highest Hour          | 3:45 PM    | 4:45 PM  | 169      | 3           |

| Top Hours for Figure 4C-6 | Start Time | End Time | Vehicles | Pedestrians |
|---------------------------|------------|----------|----------|-------------|
| Top Hour                  | 2:15 PM    | 3:15 PM  | 259      | 6           |
| 2nd Highest Hour          | 7:45 AM    | 8:45 AM  | 208      | 4           |
| 3rd Highest Hour          | 11:15 AM   | 12:15 PM | 187      | 9           |
| 4th Highest Hour          | 3:45 PM    | 4:45 PM  | 169      | 3           |

| Peak Hour Used for Graphs 4C-7 & 4C-8 |          |          |             |
|---------------------------------------|----------|----------|-------------|
| Top Hour                              |          |          |             |
| Start Time                            | End Time | Vehicles | Pedestrians |
| 2:15 PM                               | 3:15 PM  | 259      | 6           |

|   |   |
|---|---|
| Number of Hours That Met the 4-Hour Criteria 4C-5 | 0 |
|---|---|

|   |   |
|---|---|
| Number of Hours That Met the 4-Hour Criteria 4C-6 | 0 |
|---|---|

Figure 4C-5. Warrant 4, Pedestrians Four-Hour Volume

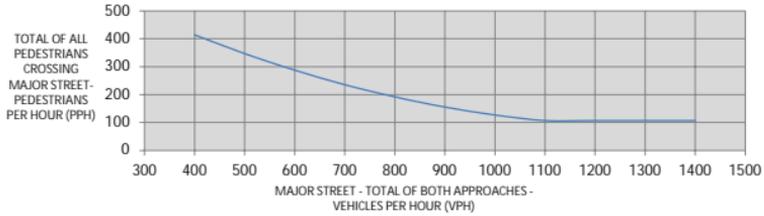


Figure 4C-6. Warrant 4, Pedestrian Four Hour Volume (70% Factor)

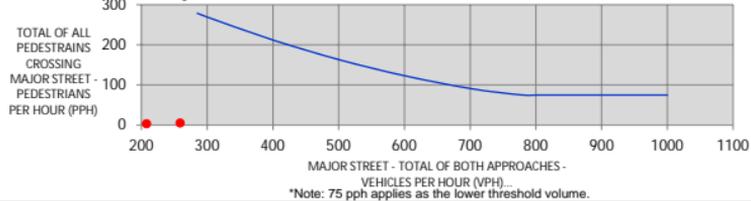


Figure 4C-7. Warrant 4, Pedestrian Peak Hour

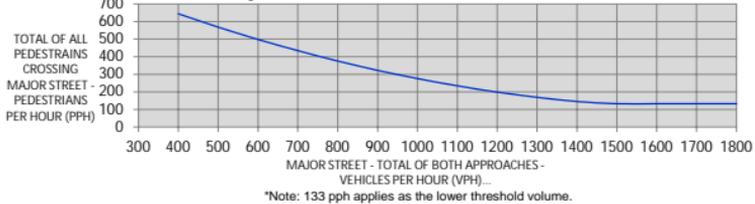
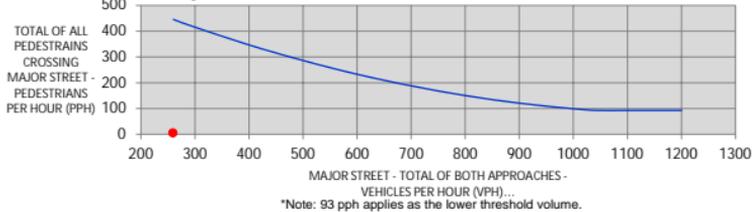


Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



## STUDY AND ANALYSIS INFORMATION

|                                   |                     |  |                         |
|-----------------------------------|---------------------|--|-------------------------|
| <b>Municipality:</b>              | Stubenville         | <b>Traffic Volumes Obtained By:</b>                      | Smart Services          |
| <b>County:</b>                    | Jefferson           | <b>Analysis Date:</b>                                    | 11/5/2024               |
| <b>ODOT Engineering District:</b> | 11                  | <b>Agency/ Company Name Performing Warrant Analysis:</b> | Strand Associates, Inc. |
| <b>Google map link:</b>           | <a href="#">Map</a> |  |                         |

### Analysis Information

**Data Collection Date:** 9/10/2024  
**Day of the Week:** Tuesday

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Existing Traffic Signal at intersection: Yes

Total Number of Approaches at Intersection: 4

### Major Street Information

Major Street Name and Route Number: Washington St

Major Street Approach Direction: E-Bound  
W-Bound

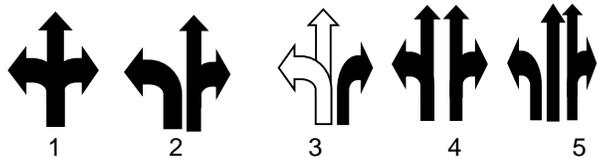
Number of Thru Lanes on Each Major Street Approach: 2 LANE(S)

Speed Limit or 85th Percentile Speed on the Major Street\*: 25 MPH  
\*Unknown assumes below 45 mph

### Minor Street Information

Minor Street Name and Route Number: 3rd St

Minor Street Approach Configuration: 2 N-Bound  
2 S-Bound



Number of Thru Lanes on Each Minor Street Approach: 1 LANE(S)

Apply Right Turn Lane Reduction\*: Yes

\*Right Turn Lane Reduction Shall be used for Warrants 1, 2, & 3 for New ODOT Signals. Please refer to TEM 402-3.2 for clarification and criteria under which Right Turn Reduction is not required.

## TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

|  | Warrant     |            | Notes and Comments:   |                  |         |         |
|--|-------------|------------|---|------------------|---------|---------|
|  | Applicable? | Satisfied? |   |                  |         |         |
| <b>Warrant 1, Eight-Hour Vehicular Volume</b>  | Yes         | No         |   |                  |         |         |
| <b>Warrant 2, Four-Hour Vehicular Volume</b>   | Yes         | No         |   |                  |         |         |
| <b>Warrant 3, Peak Hour</b>  | Yes         | No         | Signals installed under Warrant 3 should be traffic actuated. <table border="1" style="float: right; margin-top: 5px;"> <tr><td style="text-align: center;"><b>Peak Hour</b></td></tr> <tr><td style="text-align: center;">2:15 PM</td></tr> <tr><td style="text-align: center;">3:15 PM</td></tr> </table>   | <b>Peak Hour</b> | 2:15 PM | 3:15 PM |
| <b>Peak Hour</b>   |             |            |   |                  |         |         |
| 2:15 PM  |             |            |   |                  |         |         |
| 3:15 PM  |             |            |   |                  |         |         |
| For Warrants 1-3, new ODOT signals must be based off of 100% volume thresholds (TEM 402-3.2) |             |            |   |                  |         |         |
| <b>Warrant 4, Pedestrian Volume</b>  | Yes         | No         | If this warrant is met, and a traffic control signal is justified by an engineering study, the traffic control signal shall be equipped with pedestrian signal heads complying with the provisions set forth in Chapter 4E of the OMUTCD. <table border="1" style="float: right; margin-top: 5px;"> <tr><td style="text-align: center;"><b>Peak Hour</b></td></tr> <tr><td style="text-align: center;">2:15 PM</td></tr> <tr><td style="text-align: center;">3:15 PM</td></tr> </table> | <b>Peak Hour</b> | 2:15 PM | 3:15 PM |
| <b>Peak Hour</b>   |             |            |   |                  |         |         |
| 2:15 PM  |             |            |   |                  |         |         |
| 3:15 PM  |             |            |   |                  |         |         |
| <b>Warrant 5, School Crossing</b>  | No          |            | N/A   |                  |         |         |
| <b>Warrant 6, Coordinated Signal System</b>  | No          |            | (Shall not be used as the sole warrant in the analysis)   |                  |         |         |
| <b>Warrant 7, Crash Experience</b>   | No          |            | If this is the sole warrant, signal must be semi-actuated with control devices which provide proper coordination if installed at an intersection within a coordinated system and normally should be fully traffic actuated if installed at an isolated intersection.  |                  |         |         |
| <b>Warrant 8, Roadway Network</b>  | No          |            | (Shall not be used as the sole warrant in the analysis)   |                  |         |         |
| <b>Warrant 9, Intersection Near a Grade Crossing</b>   | No          |            | Figure 4C-9   |                  |         |         |
| <b>Multi-Way Stop Warrant</b>  | Yes         | Yes        | May be used as an interim measure if traffic signal warrants are satisfied.   |                  |         |         |

**The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.**

If no warrants are satisfied, additional options may be considered:

1. An engineering study, performed by a firm prequalified by ODOT for signal design, if approved by the ODOT district, may be used to justify a new signal installation or retention of an existing signal that otherwise does not meet the published warrants. An example of such an instance is a traffic signal in proximity to a railroad crossing that serves to reduce queuing across the tracks.
2. According to TEM 402-2, If the actual turning movement counts fail to satisfy a signal warrant, it may be acceptable to use traffic volumes projected to the second year after project completion. The **Modeling and Forecasting Section** should provide the projected traffic volumes.
3. A pedestrian hybrid beacon may be considered for installation to facilitate pedestrian crossings at a location that does not meet traffic signal warrants (see Chapter 4C of TEM) or at a location that meets traffic signal warrants under Sections 4C.05 and/or 4C.06 but a decision is made to not install a traffic control signal. **Please fill inputs on PHB Score Sheet and submit to ODOT.**

Considerations such as geometrics and lack of sight distance generally have not been accepted in lieu of satisfying signal warrants. These considerations may allow an otherwise unwarranted traffic signal to be retained at **100 percent** local cost. Please review TEM 402-4 for details.

Conclusion: **Do Not Retain Existing Traffic Signal**

Notes:

## OMUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

**Number of Lanes for Moving Traffic on Each Approach**

**Major Street:** 2 or More Lanes

**Minor Street:** 1 Lane

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? No

*\*Only applicable after an adequate trial of other alternatives (See section 4C.02.06 of the 2012 OMUTCD)*

| Lanes Major/Minor | Adjusted Volumes |       | Condition A |      |      |      | Condition B |      |      |      | Combination A/B* |      |      |      |      |      |      |      |
|-------------------|------------------|-------|-------------|------|------|------|-------------|------|------|------|------------------|------|------|------|------|------|------|------|
|                   |                  |       | 100%        |      | 70%  |      | 100%        |      | 70%  |      | 80%              |      | 80%  |      | 56%  |      | 56%  |      |
|                   | Major            | Minor | Maj.        | Min. | Maj. | Min. | Maj.        | Min. | Maj. | Min. | Maj.             | Min. | Maj. | Min. | Maj. | Min. | Maj. | Min. |
| 1 / 1             |                  |       | 500         | 150  | 350  | 105  | 750         | 75   | 525  | 53   | 400              | 120  | 600  | 60   | 280  | 84   | 420  | 42   |
| 2+ / 1            | X                |       | 600         | 150  | 420  | 105  | 900         | 75   | 630  | 53   | 480              | 120  | 720  | 60   | 336  | 84   | 504  | 42   |
| 2+ / 2+           |                  |       | 600         | 200  | 420  | 140  | 900         | 100  | 630  | 70   | 480              | 160  | 720  | 80   | 336  | 112  | 504  | 56   |
| 1 / 2+            |                  |       | 500         | 200  | 350  | 140  | 750         | 100  | 525  | 70   | 400              | 160  | 600  | 80   | 280  | 112  | 420  | 56   |
| 12:00 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:15 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:30 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:45 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:15 AM           | 29               | 26    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:30 AM           | 74               | 49    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:45 AM           | 133              | 77    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:00 AM           | 184              | 120   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:15 AM           | 204              | 130   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:30 AM           | 217              | 152   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:45 AM           | 210              | 157   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:00 AM           | 200              | 135   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:15 AM           | 192              | 120   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:30 AM           | 181              | 87    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:45 AM           | 176              | 72    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:00 AM           | 189              | 74    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:15 AM           | 204              | 68    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:30 AM           | 214              | 73    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:45 AM           | 212              | 74    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:00 AM          | 199              | 68    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:15 AM          | 204              | 83    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |



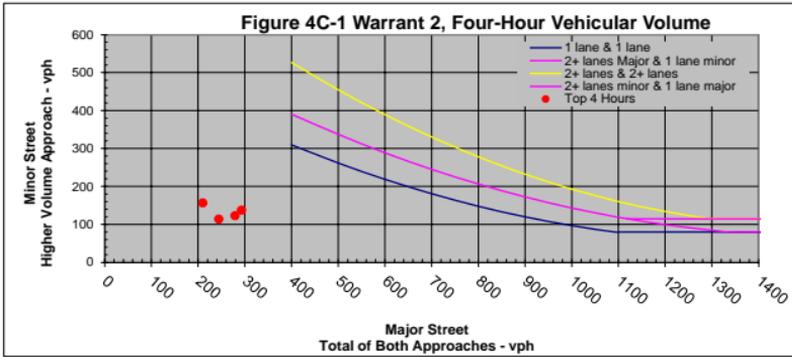
**OMUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME**

|   |   |   |
|---|---|---|
| Number of Lanes for Moving Traffic on Each Approach | Total Number of Unique Hours Met on Figure 4C-1 | 0 |
|---|---|---|

|                               |  |   |
|-------------------------------|--|---|
| Major street: 2 or More Lanes | Total Number of Unique Hours Met on Figure 4C-2 (70% Factor) | 0 |
| Minor Street: 1 Lane          |  |   |

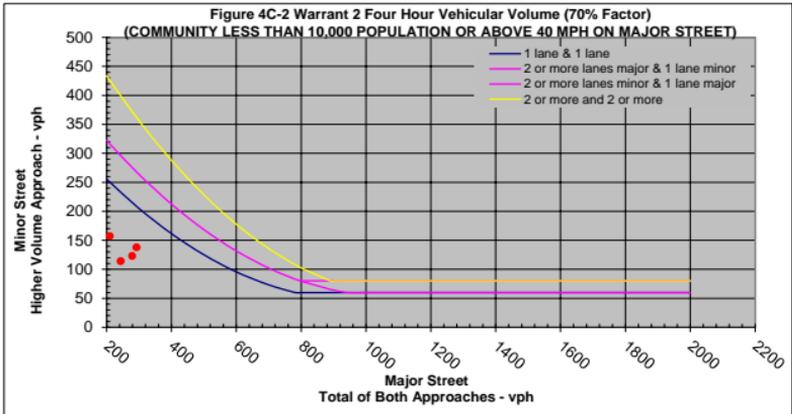
|   |    |
|---|----|
| Build up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? | No |
|---|----|

| Hour Interval Beginning At | Raw Traffic Counts |         |                       |         | Total Major Approach Volumes | Highest Actual Minor Street Approach Volumes | Hour Met? | Hour Met? (70% Factor) |
|----------------------------|--------------------|---------|-----------------------|---------|------------------------------|--|-----------|------------------------|
|                            | Minor - 3rd St     |         | Major - Washington St |         |                              |  |           |                        |
|                            | N-Bound            | S-Bound | W-Bound               | E-Bound |                              |  |           |                        |
| 6:00 AM                    | 0                  | 0       | 0                     | 0       | 0                            | 0  |           |                        |
| 6:15 AM                    | 7                  | 26      | 14                    | 15      | 29                           | 26   |           |                        |
| 6:30 AM                    | 13                 | 49      | 44                    | 30      | 74                           | 49   |           |                        |
| 6:45 AM                    | 22                 | 77      | 77                    | 56      | 133                          | 77   |           |                        |
| 7:00 AM                    | 28                 | 120     | 108                   | 76      | 184                          | 120  |           |                        |
| 7:15 AM                    | 39                 | 130     | 118                   | 86      | 204                          | 130  |           |                        |
| 7:30 AM                    | 46                 | 152     | 117                   | 100     | 217                          | 152  |           |                        |
| 7:45 AM                    | 47                 | 157     | 111                   | 99      | 210                          | 157  |           |                        |
| 8:00 AM                    | 59                 | 135     | 103                   | 97      | 200                          | 135  |           |                        |
| 8:15 AM                    | 63                 | 120     | 97                    | 95      | 192                          | 120  |           |                        |
| 8:30 AM                    | 63                 | 87      | 95                    | 86      | 181                          | 87   |           |                        |
| 8:45 AM                    | 58                 | 72      | 103                   | 73      | 176                          | 72   |           |                        |
| 9:00 AM                    | 65                 | 74      | 113                   | 76      | 189                          | 74   |           |                        |
| 9:15 AM                    | 47                 | 68      | 122                   | 82      | 204                          | 68   |           |                        |
| 9:30 AM                    | 62                 | 73      | 117                   | 97      | 214                          | 73   |           |                        |
| 9:45 AM                    | 66                 | 74      | 101                   | 111     | 212                          | 74   |           |                        |
| 10:00 AM                   | 66                 | 68      | 90                    | 109     | 199                          | 68   |           |                        |
| 10:15 AM                   | 71                 | 83      | 93                    | 111     | 204                          | 83   |           |                        |
| 10:30 AM                   | 75                 | 82      | 92                    | 108     | 200                          | 82   |           |                        |
| 10:45 AM                   | 85                 | 82      | 100                   | 119     | 219                          | 85   |           |                        |
| 11:00 AM                   | 89                 | 86      | 98                    | 132     | 230                          | 89   |           |                        |
| 11:15 AM                   | 102                | 87      | 90                    | 134     | 224                          | 102  |           |                        |
| 11:30 AM                   | 103                | 101     | 109                   | 138     | 247                          | 103  |           |                        |
| 11:45 AM                   | 105                | 105     | 107                   | 136     | 243                          | 105  |           |                        |
| 12:00 PM                   | 101                | 114     | 108                   | 136     | 244                          | 114  |           |                        |
| 12:15 PM                   | 94                 | 108     | 110                   | 135     | 245                          | 108  |           |                        |
| 12:30 PM                   | 85                 | 100     | 97                    | 129     | 226                          | 100  |           |                        |
| 12:45 PM                   | 79                 | 101     | 104                   | 128     | 232                          | 101  |           |                        |
| 1:00 PM                    | 81                 | 92      | 104                   | 116     | 220                          | 92   |           |                        |
| 1:15 PM                    | 77                 | 90      | 109                   | 124     | 233                          | 90   |           |                        |
| 1:30 PM                    | 86                 | 98      | 111                   | 132     | 243                          | 98   |           |                        |
| 1:45 PM                    | 97                 | 120     | 111                   | 147     | 258                          | 120  |           |                        |
| 2:00 PM                    | 115                | 129     | 108                   | 165     | 273                          | 129  |           |                        |
| 2:15 PM                    | 115                | 138     | 113                   | 180     | 293                          | 138  |           |                        |
| 2:30 PM                    | 119                | 126     | 110                   | 181     | 291                          | 126  |           |                        |
| 2:45 PM                    | 108                | 104     | 106                   | 166     | 272                          | 108  |           |                        |
| 3:00 PM                    | 103                | 101     | 119                   | 162     | 281                          | 103  |           |                        |
| 3:15 PM                    | 122                | 96      | 115                   | 158     | 273                          | 122  |           |                        |
| 3:30 PM                    | 123                | 96      | 111                   | 162     | 273                          | 123  |           |                        |
| 3:45 PM                    | 123                | 108     | 109                   | 170     | 279                          | 123  |           |                        |
| 4:00 PM                    | 109                | 100     | 102                   | 174     | 276                          | 109  |           |                        |
| 4:15 PM                    | 88                 | 101     | 96                    | 167     | 263                          | 101  |           |                        |
| 4:30 PM                    | 75                 | 98      | 101                   | 161     | 262                          | 98   |           |                        |
| 4:45 PM                    | 49                 | 85      | 103                   | 156     | 259                          | 85   |           |                        |
| 5:00 PM                    | 52                 | 92      | 107                   | 147     | 254                          | 92   |           |                        |
| 5:15 PM                    | 41                 | 86      | 106                   | 135     | 241                          | 86   |           |                        |
| 5:30 PM                    | 42                 | 81      | 95                    | 129     | 224                          | 81   |           |                        |
| 5:45 PM                    | 39                 | 78      | 81                    | 120     | 201                          | 78   |           |                        |
| 6:00 PM                    | 36                 | 62      | 56                    | 112     | 168                          | 62   |           |                        |
| 6:15 PM                    | 27                 | 43      | 33                    | 80      | 113                          | 43   |           |                        |
| 6:30 PM                    | 18                 | 31      | 17                    | 49      | 66                           | 31   |           |                        |
| 6:45 PM                    | 10                 | 13      | 3                     | 21      | 24                           | 13   |           |                        |
| 7:00 PM                    | 0                  | 0       | 0                     | 0       | 0                            | 0  |           |                        |
| 7:15 PM                    | 0                  | 0       | 0                     | 0       | 0                            | 0  |           |                        |
| 7:30 PM                    | 0                  | 0       | 0                     | 0       | 0                            | 0  |           |                        |
| 7:45 PM                    | 0                  | 0       | 0                     | 0       | 0                            | 0  |           |                        |
| 8:00 PM                    | 0                  | 0       | 0                     | 0       | 0                            | 0  |           |                        |



| Top Hours for Figure 4C-1 |          | Start Time | End Time | Major Street | Minor Street |
|---------------------------|----------|------------|----------|--------------|--------------|
| Top Hour                  | 2:15 PM  | 3:15 PM    | 293      | 138          |              |
| 2nd Highest Hour          | 3:45 PM  | 4:45 PM    | 279      | 123          |              |
| 3rd Highest Hour          | 7:45 AM  | 8:45 AM    | 210      | 157          |              |
| 4th Highest Hour          | 12:00 PM | 1:00 PM    | 244      | 114          |              |

| Top Hours for Figure 4C-2 |          | Start Time | End Time | Major Street | Minor Street |
|---------------------------|----------|------------|----------|--------------|--------------|
| Top Hour                  | 2:15 PM  | 3:15 PM    | 293      | 138          |              |
| 2nd Highest Hour          | 3:45 PM  | 4:45 PM    | 279      | 123          |              |
| 3rd Highest Hour          | 7:45 AM  | 8:45 AM    | 210      | 157          |              |
| 4th Highest Hour          | 12:00 PM | 1:00 PM    | 244      | 114          |              |



Are the requirements for Warrant 2 met?:

### OMUTCD WARRANT 3, PEAK HOUR

|   |                      |         |
|---|----------------------|---------|
| Number of Lanes for Moving Traffic on Each Approach | Peak Hour Start time | 2:15 PM |
| Major Street: 2 or More Lanes                       | Peak Hour End Time   | 3:15 PM |
| Minor Street: 1 Lane                                |                      |         |

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street?

No

Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?

No

**Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present\***

Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?

No

Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?

Yes

Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?

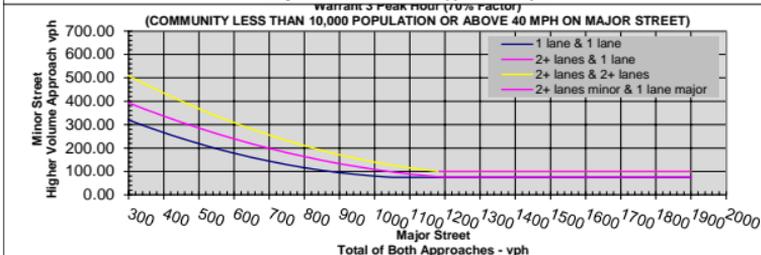
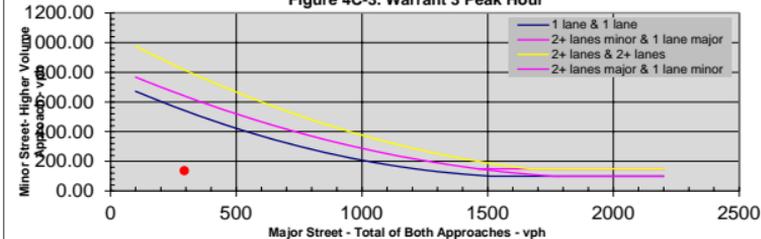
No

\*If applicable, attach all supporting calculations and documentation.

Are the requirements for Warrant 3 met?:

No

**Figure 4C-3. Warrant 3 Peak Hour**



| Hour Vehicular Volume      |   |   |  |   | Actual Peak Hour Major Traffic Volume | Actual Peak Hour Minor Traffic Volume | Required Peak Hour Minor Traffic Volume for Fig. 4C-3 | Required Peak Hour Minor Traffic Volume for Fig. 4C-4 |
|----------------------------|---|---|--|---|---------------------------------------|---------------------------------------|---|---|
| Hour Interval Beginning At | Major Street Combined Vehicles Per Hour (VPH) | Highest Minor Street Approach Vehicles Per Hour (VPH) | Sum of Major Street and Highest Minor Street | Sum of Major Street and Combined Minor Street |                                       |                                       |   |   |
| 6:00 AM                    | 0   | 0   | 0  | 0   | 293                                   | 138                                   | 641   | 397   |
| 6:15 AM                    | 29  | 26  | 55   | 62  |                                       |                                       |   |   |
| 6:30 AM                    | 74  | 49  | 123  | 136   |                                       |                                       |   |   |
| 6:45 AM                    | 133   | 77  | 210  | 232   |                                       |                                       |   |   |
| 7:00 AM                    | 184   | 120   | 304  | 332   |                                       |                                       |   |   |
| 7:15 AM                    | 204   | 130   | 334  | 373   |                                       |                                       |   |   |
| 7:30 AM                    | 217   | 152   | 369  | 415   |                                       |                                       |   |   |
| 7:45 AM                    | 210   | 157   | 367  | 414   |                                       |                                       |   |   |
| 8:00 AM                    | 200   | 135   | 335  | 394   |                                       |                                       |   |   |
| 8:15 AM                    | 192   | 120   | 312  | 375   |                                       |                                       |   |   |
| 8:30 AM                    | 181   | 87  | 268  | 331   |                                       |                                       |   |   |
| 8:45 AM                    | 176   | 72  | 248  | 306   |                                       |                                       |   |   |
| 9:00 AM                    | 189   | 74  | 263  | 328   |                                       |                                       |   |   |
| 9:15 AM                    | 204   | 68  | 272  | 319   |                                       |                                       |   |   |
| 9:30 AM                    | 214   | 73  | 287  | 349   |                                       |                                       |   |   |
| 9:45 AM                    | 212   | 74  | 286  | 352   |                                       |                                       |   |   |
| 10:00 AM                   | 199   | 68  | 267  | 333   |                                       |                                       |   |   |
| 10:15 AM                   | 204   | 83  | 287  | 358   |                                       |                                       |   |   |
| 10:30 AM                   | 200   | 82  | 282  | 357   |                                       |                                       |   |   |
| 10:45 AM                   | 219   | 85  | 304  | 386   |                                       |                                       |   |   |
| 11:00 AM                   | 230   | 89  | 319  | 407   |                                       |                                       |   |   |
| 11:15 AM                   | 224   | 102   | 326  | 413   |                                       |                                       |   |   |
| 11:30 AM                   | 247   | 103   | 350  | 451   |                                       |                                       |   |   |
| 11:45 AM                   | 243   | 105   | 348  | 453   |                                       |                                       |   |   |
| 12:00 PM                   | 244   | 114   | 358  | 459   |                                       |                                       |   |   |
| 12:15 PM                   | 245   | 108   | 353  | 447   |                                       |                                       |   |   |
| 12:30 PM                   | 226   | 100   | 326  | 411   |                                       |                                       |   |   |
| 12:45 PM                   | 232   | 101   | 333  | 412   |                                       |                                       |   |   |
| 1:00 PM                    | 220   | 92  | 312  | 393   |                                       |                                       |   |   |
| 1:15 PM                    | 233   | 90  | 323  | 400   |                                       |                                       |   |   |
| 1:30 PM                    | 243   | 98  | 341  | 427   |                                       |                                       |   |   |
| 1:45 PM                    | 258   | 120   | 378  | 475   |                                       |                                       |   |   |
| 2:00 PM                    | 273   | 129   | 402  | 517   |                                       |                                       |   |   |
| 2:15 PM                    | 293   | 138   | 431  | 546   |                                       |                                       |   |   |
| 2:30 PM                    | 291   | 126   | 417  | 536   |                                       |                                       |   |   |
| 2:45 PM                    | 272   | 108   | 380  | 484   |                                       |                                       |   |   |
| 3:00 PM                    | 281   | 103   | 384  | 485   |                                       |                                       |   |   |
| 3:15 PM                    | 273   | 122   | 395  | 491   |                                       |                                       |   |   |
| 3:30 PM                    | 273   | 123   | 396  | 492   |                                       |                                       |   |   |
| 3:45 PM                    | 279   | 123   | 402  | 510   |                                       |                                       |   |   |
| 4:00 PM                    | 276   | 109   | 385  | 485   |                                       |                                       |   |   |
| 4:15 PM                    | 263   | 101   | 364  | 452   |                                       |                                       |   |   |
| 4:30 PM                    | 262   | 98  | 360  | 435   |                                       |                                       |   |   |
| 4:45 PM                    | 259   | 85  | 344  | 393   |                                       |                                       |   |   |
| 5:00 PM                    | 254   | 92  | 346  | 398   |                                       |                                       |   |   |
| 5:15 PM                    | 241   | 86  | 327  | 368   |                                       |                                       |   |   |
| 5:30 PM                    | 224   | 81  | 305  | 347   |                                       |                                       |   |   |
| 5:45 PM                    | 201   | 78  | 279  | 318   |                                       |                                       |   |   |
| 6:00 PM                    | 168   | 62  | 230  | 266   |                                       |                                       |   |   |
| 6:15 PM                    | 113   | 43  | 156  | 183   |                                       |                                       |   |   |
| 6:30 PM                    | 66  | 31  | 97   | 115   |                                       |                                       |   |   |
| 6:45 PM                    | 24  | 13  | 37   | 47  |                                       |                                       |   |   |
| 7:00 PM                    | 0   | 0   | 0  | 0   |                                       |                                       |   |   |
| 7:15 PM                    | 0   | 0   | 0  | 0   |                                       |                                       |   |   |
| 7:30 PM                    | 0   | 0   | 0  | 0   |                                       |                                       |   |   |
| 7:45 PM                    | 0   | 0   | 0  | 0   |                                       |                                       |   |   |
| 8:00 PM                    | 0   | 0   | 0  | 0   |                                       |                                       |   |   |

## OMUTCD WARRANT 4, PEDESTRIAN VOLUME

| Hour Interval Beginning At  | Major Street Combined Vehicles Per Hour (VPH) | Total of All Pedestrians Crossing Major Street Pedestrians Per Hour (PPH) |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
|---|---|---|--|----|--|--|---------------------------------------|-------------|----------|----------|-------------|----------|---------|---------|-----|---|------------------|----------|----------|-------------|---|------------------|----------|---------|-----|----|---|----------|---------|-----|----|---|--|--|--|--|
| 6:00 AM   | 0   | 0   | <b>Built-up Isolated Community With Less Than 10,000 Population or Above 35 MPH on Major Street?</b> <span style="float: right; background-color: #90EE90; padding: 2px;">No</span>  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 6:15 AM   | 29  | 0   | 15th Percentile Pedestrian Crossing Speed Less than 3.5 ft/s? <span style="float: right; background-color: #90EE90; padding: 2px;">No</span><br><i>*If applicable, attach all supporting calculations, documentation, and findings.</i>  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 6:30 AM   | 74  | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 6:45 AM   | 133   | 2   | If 15th Percentile Pedestrian Crossing Speed is Less than 3.5 f/s, Reduce Criterion by (up to 50%): <span style="float: right; background-color: #FFFF00; padding: 2px;"></span>   |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 7:00 AM   | 184   | 4   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 7:15 AM   | 204   | 6   | <b>Is the distance to the nearest traffic control signal or STOP sign controlling the major street that pedestrians desire to cross less than 300 feet?</b> <span style="float: right; background-color: #90EE90; padding: 2px;">No</span>   |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 7:30 AM   | 217   | 8   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 7:45 AM   | 210   | 9   | If the distance to the nearest traffic control signal or STOP sign controlling the major street that pedestrians desire to cross is less than 300 feet, will the proposed traffic control signal restrict the progressive movement of traffic? If applicable, attach supporting justification. <span style="float: right; background-color: #FFFF00; padding: 2px;">No</span>  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 8:00 AM   | 200   | 7   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 8:15 AM   | 192   | 6   | <b>Does the intersection meet the 4-Hour Volume?</b> <span style="float: right; background-color: #90EE90; padding: 2px;">No</span>  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 8:30 AM   | 181   | 4   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 8:45 AM   | 176   | 4   | <b>Does the intersection meet the Peak Hour?</b> <span style="float: right; background-color: #90EE90; padding: 2px;">No</span>  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 9:00 AM   | 189   | 4   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 9:15 AM   | 204   | 3   | <b>Are the Requirements for Warrant 4 Satisfied?</b> <span style="float: right; background-color: #90EE90; padding: 2px;">No</span>  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 9:30 AM   | 214   | 5   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 9:45 AM   | 212   | 2   | <table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th>Top Hours for Figure 4C-5</th> <th>Start Time</th> <th>End Time</th> <th>Vehicles</th> <th>Pedestrians</th> </tr> </thead> <tbody> <tr> <td style="background-color: #ADD8E6;">Top Hour</td> <td>2:15 PM</td> <td>3:15 PM</td> <td>293</td> <td>2</td> </tr> <tr> <td>2nd Highest Hour</td> <td>3:45 PM</td> <td>4:45 PM</td> <td>279</td> <td>0</td> </tr> <tr> <td>3rd Highest Hour</td> <td>4:45 PM</td> <td>5:45 PM</td> <td>259</td> <td>0</td> </tr> <tr> <td>4th Highest Hour</td> <td>12:00 PM</td> <td>1:00 PM</td> <td>244</td> <td>12</td> </tr> </tbody> </table>  |    |  |  | Top Hours for Figure 4C-5             | Start Time  | End Time | Vehicles | Pedestrians | Top Hour | 2:15 PM | 3:15 PM | 293 | 2 | 2nd Highest Hour | 3:45 PM  | 4:45 PM  | 279         | 0 | 3rd Highest Hour | 4:45 PM  | 5:45 PM | 259 | 0  | 4th Highest Hour  | 12:00 PM | 1:00 PM | 244 | 12 |   |  |  |  |  |
| Top Hours for Figure 4C-5   | Start Time                                    | End Time  |  |    |  |  | Vehicles                              | Pedestrians |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| Top Hour  | 2:15 PM                                       | 3:15 PM   | 293  | 2  |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 2nd Highest Hour  | 3:45 PM                                       | 4:45 PM   | 279  | 0  |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 3rd Highest Hour  | 4:45 PM                                       | 5:45 PM   | 259  | 0  |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 4th Highest Hour  | 12:00 PM                                      | 1:00 PM   | 244  | 12 |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 10:00 AM  | 199   | 2   | <table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th>Top Hours for Figure 4C-6</th> <th>Start Time</th> <th>End Time</th> <th>Vehicles</th> <th>Pedestrians</th> </tr> </thead> <tbody> <tr> <td style="background-color: #ADD8E6;">Top Hour</td> <td>2:15 PM</td> <td>3:15 PM</td> <td>293</td> <td>2</td> </tr> <tr> <td>2nd Highest Hour</td> <td>3:45 PM</td> <td>4:45 PM</td> <td>279</td> <td>0</td> </tr> <tr> <td>3rd Highest Hour</td> <td>12:00 PM</td> <td>1:00 PM</td> <td>244</td> <td>12</td> </tr> <tr> <td>4th Highest Hour</td> <td>4:45 PM</td> <td>5:45 PM</td> <td>259</td> <td>0</td> </tr> </tbody> </table>  |    |  |  | Top Hours for Figure 4C-6             | Start Time  | End Time | Vehicles | Pedestrians | Top Hour | 2:15 PM | 3:15 PM | 293 | 2 | 2nd Highest Hour | 3:45 PM  | 4:45 PM  | 279         | 0 | 3rd Highest Hour | 12:00 PM | 1:00 PM | 244 | 12 | 4th Highest Hour  | 4:45 PM  | 5:45 PM | 259 | 0  |   |  |  |  |  |
| Top Hours for Figure 4C-6   | Start Time                                    | End Time  |  |    |  |  | Vehicles                              | Pedestrians |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| Top Hour  | 2:15 PM                                       | 3:15 PM   | 293  | 2  |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 2nd Highest Hour  | 3:45 PM                                       | 4:45 PM   | 279  | 0  |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 3rd Highest Hour  | 12:00 PM                                      | 1:00 PM   | 244  | 12 |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 4th Highest Hour  | 4:45 PM                                       | 5:45 PM   | 259  | 0  |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 10:15 AM  | 204   | 2   | <table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th colspan="5" style="text-align: center;">Peak Hour Used for Graphs 4C-7 &amp; 4C-8</th> </tr> <tr> <th colspan="5" style="text-align: center; background-color: #ADD8E6;">Top Hour</th> </tr> <tr> <th>Start Time</th> <th>End Time</th> <th>Vehicles</th> <th colspan="2">Pedestrians</th> </tr> <tr> <td>2:15 PM</td> <td>3:15 PM</td> <td>293</td> <td colspan="2">2</td> </tr> </thead> <tbody> <tr> <td colspan="5">Number of Hours That Met the 4-Hour Criteria 4C-5 <span style="float: right; background-color: #90EE90; padding: 2px;">0</span></td> </tr> <tr> <td colspan="5">Number of Hours That Met the 4-Hour Criteria 4C-6 <span style="float: right; background-color: #90EE90; padding: 2px;">0</span></td> </tr> </tbody> </table> |    |  |  | Peak Hour Used for Graphs 4C-7 & 4C-8 |             |          |          |             | Top Hour |         |         |     |   | Start Time       | End Time | Vehicles | Pedestrians |   | 2:15 PM          | 3:15 PM  | 293     | 2   |    | Number of Hours That Met the 4-Hour Criteria 4C-5 <span style="float: right; background-color: #90EE90; padding: 2px;">0</span> |          |         |     |    | Number of Hours That Met the 4-Hour Criteria 4C-6 <span style="float: right; background-color: #90EE90; padding: 2px;">0</span> |  |  |  |  |
| Peak Hour Used for Graphs 4C-7 & 4C-8   |   |   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| Top Hour  |   |   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| Start Time  | End Time                                      | Vehicles  | Pedestrians  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 2:15 PM   | 3:15 PM                                       | 293   | 2  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| Number of Hours That Met the 4-Hour Criteria 4C-5 <span style="float: right; background-color: #90EE90; padding: 2px;">0</span> |   |   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| Number of Hours That Met the 4-Hour Criteria 4C-6 <span style="float: right; background-color: #90EE90; padding: 2px;">0</span> |   |   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 10:30 AM  | 200   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 10:45 AM  | 219   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 11:00 AM  | 230   | 1   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 11:15 AM  | 224   | 1   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 11:30 AM  | 247   | 9   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 11:45 AM  | 243   | 9   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 12:00 PM  | 244   | 12  |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 12:15 PM  | 245   | 6   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 12:30 PM  | 226   | 6   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 12:45 PM  | 232   | 9   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 1:00 PM   | 220   | 5   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 1:15 PM   | 233   | 6   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 1:30 PM   | 243   | 5   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 1:45 PM   | 258   | 3   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 2:00 PM   | 273   | 3   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 2:15 PM   | 293   | 2   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 2:30 PM   | 291   | 1   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 2:45 PM   | 272   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 3:00 PM   | 281   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 3:15 PM   | 273   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 3:30 PM   | 273   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 3:45 PM   | 279   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 4:00 PM   | 276   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 4:15 PM   | 263   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 4:30 PM   | 262   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 4:45 PM   | 259   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 5:00 PM   | 254   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 5:15 PM   | 241   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 5:30 PM   | 224   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 5:45 PM   | 201   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 6:00 PM   | 168   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 6:15 PM   | 113   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 6:30 PM   | 66  | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 6:45 PM   | 24  | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 7:00 PM   | 0   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 7:15 PM   | 0   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 7:30 PM   | 0   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 7:45 PM   | 0   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |
| 8:00 PM   | 0   | 0   |  |    |  |  |                                       |             |          |          |             |          |         |         |     |   |                  |          |          |             |   |                  |          |         |     |    |   |          |         |     |    |   |  |  |  |  |

Figure 4C-5. Warrant 4, Pedestrians Four-Hour Volume

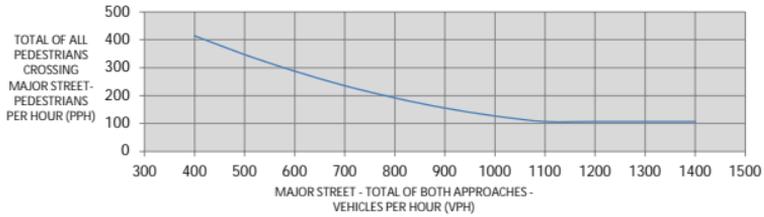


Figure 4C-6. Warrant 4, Pedestrian Four Hour Volume (70% Factor)

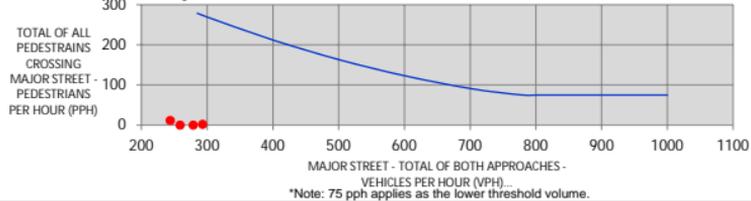


Figure 4C-7. Warrant 4, Pedestrian Peak Hour

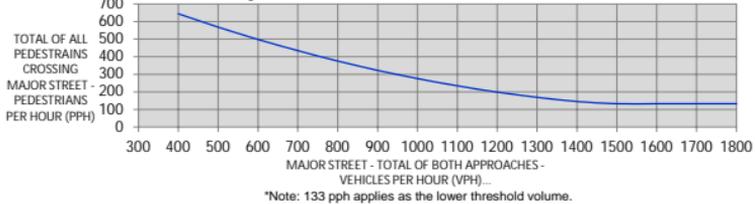
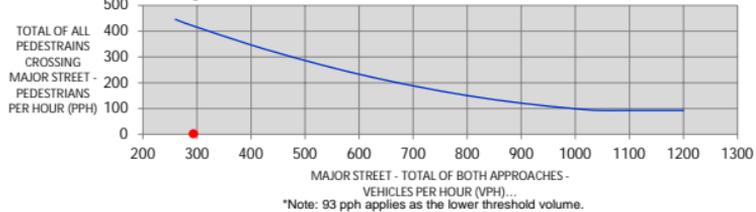


Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



## STUDY AND ANALYSIS INFORMATION

|                                   |                     |  |                         |
|-----------------------------------|---------------------|--|-------------------------|
| <b>Municipality:</b>              | Stubenville         | <b>Traffic Volumes Obtained By:</b>                      | Smart Services          |
| <b>County:</b>                    | Jefferson           | <b>Analysis Date:</b>                                    | 11/6/2024               |
| <b>ODOT Engineering District:</b> | 11                  | <b>Agency/ Company Name Performing Warrant Analysis:</b> | Strand Associates, Inc. |
| <b>Google map link:</b>           | <a href="#">Map</a> |  |                         |

### Analysis Information

**Data Collection Date:** 9/10/2024  
**Day of the Week:** Tuesday

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Existing Traffic Signal at intersection: Yes

Total Number of Approaches at Intersection: 4

### Major Street Information

Major Street Name and Route Number: Washington St

Major Street Approach Direction: E-Bound  
W-Bound

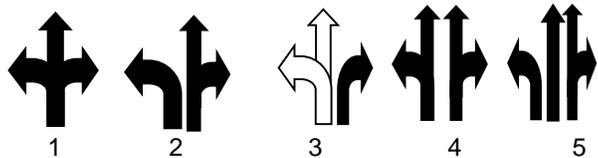
Number of Thru Lanes on Each Major Street Approach: 2 LANE(S)

Speed Limit or 85th Percentile Speed on the Major Street\*: 25 MPH  
\*Unknown assumes below 45 mph

### Minor Street Information

Minor Street Name and Route Number: 4th St

Minor Street Approach Configuration: 2 N-Bound  
2 S-Bound



Number of Thru Lanes on Each Minor Street Approach: 1 LANE(S)

Apply Right Turn Lane Reduction\*: Yes

\*Right Turn Lane Reduction Shall be used for Warrants 1, 2, & 3 for New ODOT Signals. Please refer to TEM 402-3.2 for clarification and criteria under which Right Turn Reduction is not required.

**TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS**

|  | Warrant     |            | Notes and Comments:   |                  |         |         |
|--|-------------|------------|---|------------------|---------|---------|
|  | Applicable? | Satisfied? |   |                  |         |         |
| <b>Warrant 1, Eight-Hour Vehicular Volume</b>  | Yes         | No         |   |                  |         |         |
| <b>Warrant 2, Four-Hour Vehicular Volume</b>   | Yes         | No         |   |                  |         |         |
| <b>Warrant 3, Peak Hour</b>  | Yes         | No         | Signals installed under Warrant 3 should be traffic actuated.<br><table border="1" style="float: right;"> <tr><td><b>Peak Hour</b></td></tr> <tr><td>2:15 PM</td></tr> <tr><td>3:15 PM</td></tr> </table>   | <b>Peak Hour</b> | 2:15 PM | 3:15 PM |
| <b>Peak Hour</b>   |             |            |   |                  |         |         |
| 2:15 PM  |             |            |   |                  |         |         |
| 3:15 PM  |             |            |   |                  |         |         |
| For Warrants 1-3, new ODOT signals must be based off of 100% volume thresholds (TEM 402-3.2) |             |            |   |                  |         |         |
| <b>Warrant 4, Pedestrian Volume</b>  | Yes         | No         | If this warrant is met, and a traffic control signal is justified by an engineering study, the traffic control signal shall be equipped with pedestrian signal heads complying with the provisions set forth in Chapter 4E of the OMUTCD.<br><table border="1" style="float: right;"> <tr><td><b>Peak Hour</b></td></tr> <tr><td>2:15 PM</td></tr> <tr><td>3:15 PM</td></tr> </table> | <b>Peak Hour</b> | 2:15 PM | 3:15 PM |
| <b>Peak Hour</b>   |             |            |   |                  |         |         |
| 2:15 PM  |             |            |   |                  |         |         |
| 3:15 PM  |             |            |   |                  |         |         |
| <b>Warrant 5, School Crossing</b>  | No          |            | N/A   |                  |         |         |
| <b>Warrant 6, Coordinated Signal System</b>  | No          |            | (Shall not be used as the sole warrant in the analysis)   |                  |         |         |
| <b>Warrant 7, Crash Experience</b>   | No          |            | If this is the sole warrant, signal must be semi-actuated with control devices which provide proper coordination if installed at an intersection within a coordinated system and normally should be fully traffic actuated if installed at an isolated intersection.  |                  |         |         |
| <b>Warrant 8, Roadway Network</b>  | No          |            | (Shall not be used as the sole warrant in the analysis)   |                  |         |         |
| <b>Warrant 9, Intersection Near a Grade Crossing</b>   | No          |            | Figure 4C-9   |                  |         |         |
| <b>Multi-Way Stop Warrant</b>  | Yes         | Yes        | May be used as an interim measure if traffic signal warrants are satisfied.   |                  |         |         |

**The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.**

|   |
|---|
| If no warrants are satisfied, additional options may be considered:   |
| 1. An engineering study, performed by a firm prequalified by ODOT for signal design, if approved by the ODOT district, may be used to justify a new signal installation or retention of an existing signal that otherwise does not meet the published warrants. An example of such an instance is a traffic signal in proximity to a railroad crossing that serves to reduce queuing across the tracks.     |
| 2. According to TEM 402-2, If the actual turning movement counts fail to satisfy a signal warrant, it may be acceptable to use traffic volumes projected to the second year after project completion. The <b>Modeling and Forecasting Section</b> should provide the projected traffic volumes.   |
| 3. A pedestrian hybrid beacon may be considered for installation to facilitate pedestrian crossings at a location that does not meet traffic signal warrants (see Chapter 4C of TEM) or at a location that meets traffic signal warrants under Sections 4C.05 and/or 4C.06 but a decision is made to not install a traffic control signal. <b>Please fill inputs on PHB Score Sheet and submit to ODOT.</b> |

Considerations such as geometrics and lack of sight distance generally have not been accepted in lieu of satisfying signal warrants. These considerations may allow an otherwise unwarranted traffic signal to be retained at **100 percent** local cost. Please review TEM 402-4 for details.

Conclusion: **Do Not Retain Existing Traffic Signal**

Notes:

## OMUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

**Number of Lanes for Moving Traffic on Each Approach**

**Major Street:** 2 or More Lanes

**Minor Street:** 1 Lane

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? No

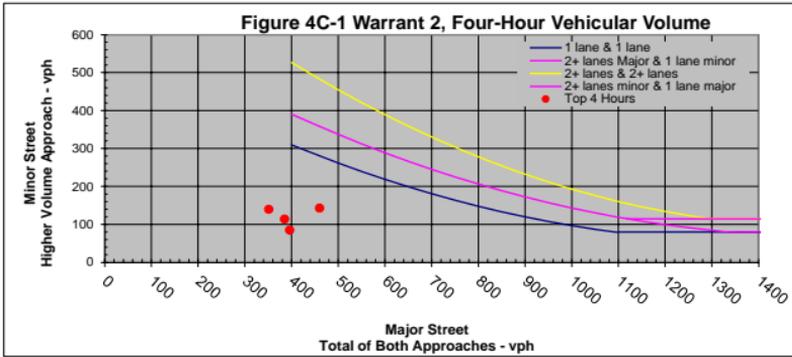
*\*Only applicable after an adequate trial of other alternatives (See section 4C.02.06 of the 2012 OMUTCD)*

| Lanes Major/Minor | Adjusted Volumes |       | Condition A |      |      |      | Condition B |      |      |      | Combination A/B* |      |      |      |      |      |      |      |
|-------------------|------------------|-------|-------------|------|------|------|-------------|------|------|------|------------------|------|------|------|------|------|------|------|
|                   |                  |       | 100%        |      | 70%  |      | 100%        |      | 70%  |      | 80%              |      | 80%  |      | 56%  |      | 56%  |      |
|                   | Major            | Minor | Maj.        | Min. | Maj. | Min. | Maj.        | Min. | Maj. | Min. | Maj.             | Min. | Maj. | Min. | Maj. | Min. | Maj. | Min. |
| 1 / 1             |                  |       | 500         | 150  | 350  | 105  | 750         | 75   | 525  | 53   | 400              | 120  | 600  | 60   | 280  | 84   | 420  | 42   |
| 2+ / 1            | X                |       | 600         | 150  | 420  | 105  | 900         | 75   | 630  | 53   | 480              | 120  | 720  | 60   | 336  | 84   | 504  | 42   |
| 2+ / 2+           |                  |       | 600         | 200  | 420  | 140  | 900         | 100  | 630  | 70   | 480              | 160  | 720  | 80   | 336  | 112  | 504  | 56   |
| 1 / 2+            |                  |       | 500         | 200  | 350  | 140  | 750         | 100  | 525  | 70   | 400              | 160  | 600  | 80   | 280  | 112  | 420  | 56   |
| 12:00 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:15 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:30 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:45 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:15 AM           | 44               | 11    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:30 AM           | 122              | 27    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:45 AM           | 218              | 45    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:00 AM           | 326              | 71    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:15 AM           | 373              | 75    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:30 AM           | 396              | 85    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:45 AM           | 384              | 85    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:00 AM           | 341              | 76    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:15 AM           | 314              | 79    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:30 AM           | 284              | 68    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:45 AM           | 265              | 68    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:00 AM           | 270              | 79    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:15 AM           | 282              | 86    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:30 AM           | 283              | 85    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:45 AM           | 293              | 98    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:00 AM          | 288              | 104   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:15 AM          | 294              | 112   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |



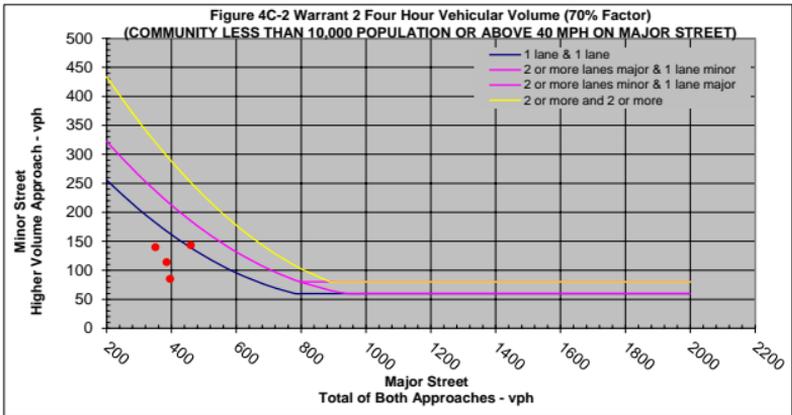
## OMUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

| Number of Lanes for Moving Traffic on Each Approach   |                    | Total Number of Unique Hours Met on Figure 4C-1              |                       |         |                              | 0  |           |                        |
|---|--------------------|--|-----------------------|---------|------------------------------|--|-----------|------------------------|
| Major street: 2 or More Lanes   |                    | Total Number of Unique Hours Met on Figure 4C-2 (70% Factor) |                       |         |                              | 0  |           |                        |
| Minor Street: 1 Lane  |                    |  |                       |         |                              |  |           |                        |
| Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? |                    |  |                       |         |                              |  |           |                        |
| No  |                    |  |                       |         |                              |  |           |                        |
| Hour Interval Beginning At  | Raw Traffic Counts |  |                       |         | Total Major Approach Volumes | Highest Actual Minor Street Approach Volumes | Hour Met? | Hour Met? (70% Factor) |
|   | Minor - 4th St     |  | Major - Washington St |         |                              |  |           |                        |
|   | N-Bound            | S-Bound  | W-Bound               | E-Bound |                              |  |           |                        |
| 6:00 AM   | 0                  | 0  | 0                     | 0       | 0                            | 0  |           |                        |
| 6:15 AM   | 11                 | 8  | 20                    | 24      | 44                           | 11   |           |                        |
| 6:30 AM   | 27                 | 17   | 64                    | 58      | 122                          | 27   |           |                        |
| 6:45 AM   | 45                 | 28   | 118                   | 100     | 218                          | 45   |           |                        |
| 7:00 AM   | 71                 | 37   | 175                   | 151     | 326                          | 71   |           |                        |
| 7:15 AM   | 75                 | 38   | 197                   | 176     | 373                          | 75   |           |                        |
| 7:30 AM   | 85                 | 38   | 196                   | 200     | 396                          | 85   |           |                        |
| 7:45 AM   | 85                 | 56   | 186                   | 198     | 384                          | 85   |           |                        |
| 8:00 AM   | 76                 | 62   | 169                   | 172     | 341                          | 76   |           |                        |
| 8:15 AM   | 79                 | 65   | 159                   | 155     | 314                          | 79   |           |                        |
| 8:30 AM   | 68                 | 66   | 152                   | 132     | 284                          | 68   |           |                        |
| 8:45 AM   | 68                 | 47   | 153                   | 112     | 265                          | 68   |           |                        |
| 9:00 AM   | 79                 | 43   | 152                   | 118     | 270                          | 79   |           |                        |
| 9:15 AM   | 86                 | 47   | 155                   | 127     | 282                          | 86   |           |                        |
| 9:30 AM   | 85                 | 40   | 156                   | 127     | 283                          | 85   |           |                        |
| 9:45 AM   | 98                 | 49   | 153                   | 140     | 293                          | 98   |           |                        |
| 10:00 AM  | 104                | 58   | 148                   | 140     | 288                          | 104  |           |                        |
| 10:15 AM  | 112                | 58   | 155                   | 139     | 294                          | 112  |           |                        |
| 10:30 AM  | 123                | 80   | 153                   | 147     | 300                          | 123  |           |                        |
| 10:45 AM  | 119                | 78   | 148                   | 160     | 308                          | 119  |           |                        |
| 11:00 AM  | 115                | 78   | 156                   | 176     | 332                          | 115  |           |                        |
| 11:15 AM  | 120                | 81   | 157                   | 188     | 345                          | 120  |           |                        |
| 11:30 AM  | 127                | 69   | 173                   | 190     | 363                          | 127  |           |                        |
| 11:45 AM  | 127                | 69   | 167                   | 190     | 357                          | 127  |           |                        |
| 12:00 PM  | 140                | 72   | 164                   | 187     | 351                          | 140  |           |                        |
| 12:15 PM  | 126                | 70   | 167                   | 181     | 348                          | 126  |           |                        |
| 12:30 PM  | 119                | 77   | 150                   | 177     | 327                          | 119  |           |                        |
| 12:45 PM  | 117                | 88   | 166                   | 176     | 342                          | 117  |           |                        |
| 1:00 PM   | 106                | 88   | 167                   | 164     | 331                          | 106  |           |                        |
| 1:15 PM   | 114                | 92   | 164                   | 164     | 328                          | 114  |           |                        |
| 1:30 PM   | 121                | 83   | 193                   | 179     | 372                          | 121  |           |                        |
| 1:45 PM   | 133                | 97   | 210                   | 197     | 407                          | 133  |           |                        |
| 2:00 PM   | 145                | 98   | 219                   | 223     | 442                          | 145  |           |                        |
| 2:15 PM   | 143                | 118  | 217                   | 243     | 460                          | 143  |           |                        |
| 2:30 PM   | 135                | 118  | 196                   | 237     | 433                          | 135  |           |                        |
| 2:45 PM   | 126                | 90   | 178                   | 214     | 392                          | 126  |           |                        |
| 3:00 PM   | 114                | 88   | 174                   | 207     | 381                          | 114  |           |                        |
| 3:15 PM   | 114                | 71   | 194                   | 191     | 385                          | 114  |           |                        |
| 3:30 PM   | 111                | 72   | 189                   | 189     | 378                          | 111  |           |                        |
| 3:45 PM   | 108                | 78   | 196                   | 199     | 395                          | 108  |           |                        |
| 4:00 PM   | 109                | 75   | 199                   | 191     | 390                          | 109  |           |                        |
| 4:15 PM   | 108                | 66   | 167                   | 186     | 353                          | 108  |           |                        |
| 4:30 PM   | 103                | 71   | 166                   | 182     | 348                          | 103  |           |                        |
| 4:45 PM   | 98                 | 65   | 151                   | 174     | 325                          | 98   |           |                        |
| 5:00 PM   | 82                 | 62   | 142                   | 153     | 295                          | 82   |           |                        |
| 5:15 PM   | 72                 | 64   | 136                   | 149     | 285                          | 72   |           |                        |
| 5:30 PM   | 61                 | 60   | 128                   | 138     | 266                          | 61   |           |                        |
| 5:45 PM   | 57                 | 57   | 115                   | 131     | 246                          | 57   |           |                        |
| 6:00 PM   | 61                 | 52   | 97                    | 149     | 246                          | 61   |           |                        |
| 6:15 PM   | 39                 | 35   | 74                    | 108     | 182                          | 39   |           |                        |
| 6:30 PM   | 29                 | 22   | 46                    | 75      | 121                          | 29   |           |                        |
| 6:45 PM   | 15                 | 11   | 21                    | 40      | 61                           | 15   |           |                        |
| 7:00 PM   | 0                  | 0  | 0                     | 0       | 0                            | 0  |           |                        |
| 7:15 PM   | 0                  | 0  | 0                     | 0       | 0                            | 0  |           |                        |
| 7:30 PM   | 0                  | 0  | 0                     | 0       | 0                            | 0  |           |                        |
| 7:45 PM   | 0                  | 0  | 0                     | 0       | 0                            | 0  |           |                        |
| 8:00 PM   | 0                  | 0  | 0                     | 0       | 0                            | 0  |           |                        |



| Top Hours for Figure 4C-1 |          | Start Time | End Time | Major Street | Minor Street |
|---------------------------|----------|------------|----------|--------------|--------------|
| Top Hour                  | 2:15 PM  | 3:15 PM    | 460      | 143          |              |
| 2nd Highest Hour          | 12:00 PM | 1:00 PM    | 351      | 140          |              |
| 3rd Highest Hour          | 3:15 PM  | 4:15 PM    | 385      | 114          |              |
| 4th Highest Hour          | 7:30 AM  | 8:30 AM    | 396      | 85           |              |

| Top Hours for Figure 4C-2 |          | Start Time | End Time | Major Street | Minor Street |
|---------------------------|----------|------------|----------|--------------|--------------|
| Top Hour                  | 2:15 PM  | 3:15 PM    | 460      | 143          |              |
| 2nd Highest Hour          | 12:00 PM | 1:00 PM    | 351      | 140          |              |
| 3rd Highest Hour          | 3:15 PM  | 4:15 PM    | 385      | 114          |              |
| 4th Highest Hour          | 7:30 AM  | 8:30 AM    | 396      | 85           |              |



Are the requirements for Warrant 2 met?:

### OMUTCD WARRANT 3, PEAK HOUR

|   |                      |         |
|---|----------------------|---------|
| Number of Lanes for Moving Traffic on Each Approach | Peak Hour Start time | 2:15 PM |
| Major Street: 2 or More Lanes                       | Peak Hour End Time   | 3:15 PM |
| Minor Street: 1 Lane                                |                      |         |

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street?

No

Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?

No

**Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present\***

Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?

Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?

Yes

Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?

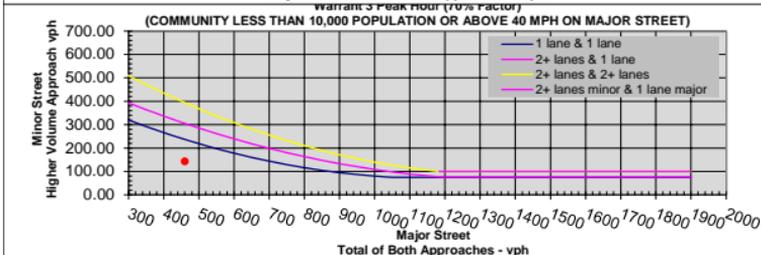
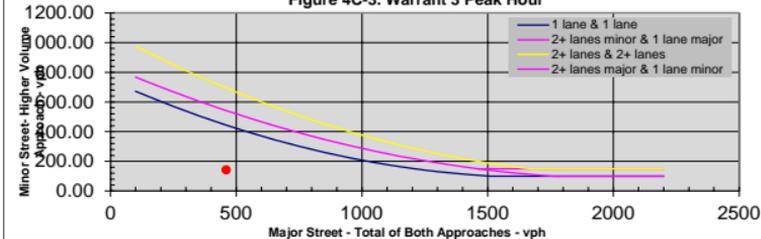
No

\*If applicable, attach all supporting calculations and documentation.

Are the requirements for Warrant 3 met?:

No

**Figure 4C-3. Warrant 3 Peak Hour**



| Hour Vehicular Volume      |   |   |  |   | Actual Peak Hour Major Traffic Volume | Actual Peak Hour Minor Traffic Volume | Required Peak Hour Minor Traffic Volume for Fig. 4C-3 | Required Peak Hour Minor Traffic Volume for Fig. 4C-4 |
|----------------------------|---|---|--|---|---------------------------------------|---------------------------------------|---|---|
| Hour Interval Beginning At | Major Street Combined Vehicles Per Hour (VPH) | Highest Minor Street Approach Vehicles Per Hour (VPH) | Sum of Major Street and Highest Minor Street | Sum of Major Street and Combined Minor Street |                                       |                                       |   |   |
| 6:00 AM                    | 0   | 0   | 0  | 0   | 460                                   | 143                                   | 542   | 305   |
| 6:15 AM                    | 44  | 11  | 55   | 63  |                                       |                                       |   |   |
| 6:30 AM                    | 122   | 27  | 149  | 166   |                                       |                                       |   |   |
| 6:45 AM                    | 218   | 45  | 263  | 291   |                                       |                                       |   |   |
| 7:00 AM                    | 326   | 71  | 397  | 434   |                                       |                                       |   |   |
| 7:15 AM                    | 373   | 75  | 448  | 486   |                                       |                                       |   |   |
| 7:30 AM                    | 396   | 85  | 481  | 519   |                                       |                                       |   |   |
| 7:45 AM                    | 384   | 85  | 469  | 525   |                                       |                                       |   |   |
| 8:00 AM                    | 341   | 76  | 417  | 479   |                                       |                                       |   |   |
| 8:15 AM                    | 314   | 79  | 393  | 458   |                                       |                                       |   |   |
| 8:30 AM                    | 284   | 68  | 352  | 418   |                                       |                                       |   |   |
| 8:45 AM                    | 265   | 68  | 333  | 380   |                                       |                                       |   |   |
| 9:00 AM                    | 270   | 79  | 349  | 392   |                                       |                                       |   |   |
| 9:15 AM                    | 282   | 86  | 368  | 415   |                                       |                                       |   |   |
| 9:30 AM                    | 283   | 85  | 368  | 408   |                                       |                                       |   |   |
| 9:45 AM                    | 293   | 98  | 391  | 440   |                                       |                                       |   |   |
| 10:00 AM                   | 288   | 104   | 392  | 450   |                                       |                                       |   |   |
| 10:15 AM                   | 294   | 112   | 406  | 464   |                                       |                                       |   |   |
| 10:30 AM                   | 300   | 123   | 423  | 503   |                                       |                                       |   |   |
| 10:45 AM                   | 308   | 119   | 427  | 505   |                                       |                                       |   |   |
| 11:00 AM                   | 332   | 115   | 447  | 525   |                                       |                                       |   |   |
| 11:15 AM                   | 345   | 120   | 465  | 546   |                                       |                                       |   |   |
| 11:30 AM                   | 363   | 127   | 490  | 559   |                                       |                                       |   |   |
| 11:45 AM                   | 357   | 127   | 484  | 553   |                                       |                                       |   |   |
| 12:00 PM                   | 351   | 140   | 491  | 563   |                                       |                                       |   |   |
| 12:15 PM                   | 348   | 126   | 474  | 544   |                                       |                                       |   |   |
| 12:30 PM                   | 327   | 119   | 446  | 523   |                                       |                                       |   |   |
| 12:45 PM                   | 342   | 117   | 459  | 547   |                                       |                                       |   |   |
| 1:00 PM                    | 331   | 106   | 437  | 525   |                                       |                                       |   |   |
| 1:15 PM                    | 328   | 114   | 442  | 534   |                                       |                                       |   |   |
| 1:30 PM                    | 372   | 121   | 493  | 576   |                                       |                                       |   |   |
| 1:45 PM                    | 407   | 133   | 540  | 637   |                                       |                                       |   |   |
| 2:00 PM                    | 442   | 145   | 587  | 685   |                                       |                                       |   |   |
| 2:15 PM                    | 460   | 143   | 603  | 721   |                                       |                                       |   |   |
| 2:30 PM                    | 433   | 135   | 568  | 686   |                                       |                                       |   |   |
| 2:45 PM                    | 392   | 126   | 518  | 608   |                                       |                                       |   |   |
| 3:00 PM                    | 381   | 114   | 495  | 583   |                                       |                                       |   |   |
| 3:15 PM                    | 385   | 114   | 499  | 570   |                                       |                                       |   |   |
| 3:30 PM                    | 378   | 111   | 489  | 561   |                                       |                                       |   |   |
| 3:45 PM                    | 395   | 108   | 503  | 581   |                                       |                                       |   |   |
| 4:00 PM                    | 390   | 107   | 497  | 572   |                                       |                                       |   |   |
| 4:15 PM                    | 353   | 108   | 461  | 527   |                                       |                                       |   |   |
| 4:30 PM                    | 348   | 103   | 451  | 522   |                                       |                                       |   |   |
| 4:45 PM                    | 325   | 98  | 423  | 488   |                                       |                                       |   |   |
| 5:00 PM                    | 295   | 82  | 377  | 439   |                                       |                                       |   |   |
| 5:15 PM                    | 285   | 72  | 357  | 421   |                                       |                                       |   |   |
| 5:30 PM                    | 266   | 61  | 327  | 387   |                                       |                                       |   |   |
| 5:45 PM                    | 246   | 57  | 303  | 360   |                                       |                                       |   |   |
| 6:00 PM                    | 246   | 61  | 307  | 359   |                                       |                                       |   |   |
| 6:15 PM                    | 182   | 39  | 221  | 256   |                                       |                                       |   |   |
| 6:30 PM                    | 121   | 29  | 150  | 172   |                                       |                                       |   |   |
| 6:45 PM                    | 61  | 15  | 76   | 87  |                                       |                                       |   |   |
| 7:00 PM                    | 0   | 0   | 0  | 0   |                                       |                                       |   |   |
| 7:15 PM                    | 0   | 0   | 0  | 0   |                                       |                                       |   |   |
| 7:30 PM                    | 0   | 0   | 0  | 0   |                                       |                                       |   |   |
| 7:45 PM                    | 0   | 0   | 0  | 0   |                                       |                                       |   |   |
| 8:00 PM                    | 0   | 0   | 0  | 0   |                                       |                                       |   |   |

## OMUTCD WARRANT 4, PEDESTRIAN VOLUME

| Hour Interval<br>Beginning At | Major Street<br>Combined<br>Vehicles Per<br>Hour (VPH) | Total of All<br>Pedestrians<br>Crossing Major<br>Street<br>Pedestrians Per<br>Hour (PPH) |
|-------------------------------|--|--|
| 6:00 AM                       | 0  | 0  |
| 6:15 AM                       | 44   | 2  |
| 6:30 AM                       | 122  | 2  |
| 6:45 AM                       | 218  | 3  |
| 7:00 AM                       | 326  | 3  |
| 7:15 AM                       | 373  | 2  |
| 7:30 AM                       | 396  | 2  |
| 7:45 AM                       | 384  | 1  |
| 8:00 AM                       | 341  | 5  |
| 8:15 AM                       | 314  | 5  |
| 8:30 AM                       | 284  | 10   |
| 8:45 AM                       | 265  | 11   |
| 9:00 AM                       | 270  | 9  |
| 9:15 AM                       | 282  | 8  |
| 9:30 AM                       | 283  | 6  |
| 9:45 AM                       | 293  | 9  |
| 10:00 AM                      | 288  | 16   |
| 10:15 AM                      | 294  | 19   |
| 10:30 AM                      | 300  | 20   |
| 10:45 AM                      | 308  | 27   |
| 11:00 AM                      | 332  | 18   |
| 11:15 AM                      | 345  | 18   |
| 11:30 AM                      | 363  | 17   |
| 11:45 AM                      | 357  | 12   |
| 12:00 PM                      | 351  | 13   |
| 12:15 PM                      | 348  | 24   |
| 12:30 PM                      | 327  | 27   |
| 12:45 PM                      | 342  | 31   |
| 1:00 PM                       | 331  | 33   |
| 1:15 PM                       | 328  | 25   |
| 1:30 PM                       | 372  | 28   |
| 1:45 PM                       | 407  | 29   |
| 2:00 PM                       | 442  | 38   |
| 2:15 PM                       | 460  | 40   |
| 2:30 PM                       | 433  | 35   |
| 2:45 PM                       | 392  | 36   |
| 3:00 PM                       | 381  | 28   |
| 3:15 PM                       | 385  | 23   |
| 3:30 PM                       | 378  | 26   |
| 3:45 PM                       | 395  | 24   |
| 4:00 PM                       | 390  | 17   |
| 4:15 PM                       | 353  | 18   |
| 4:30 PM                       | 348  | 12   |
| 4:45 PM                       | 325  | 15   |
| 5:00 PM                       | 295  | 16   |
| 5:15 PM                       | 285  | 17   |
| 5:30 PM                       | 266  | 17   |
| 5:45 PM                       | 246  | 12   |
| 6:00 PM                       | 246  | 12   |
| 6:15 PM                       | 182  | 7  |
| 6:30 PM                       | 121  | 6  |
| 6:45 PM                       | 61   | 3  |
| 7:00 PM                       | 0  | 0  |
| 7:15 PM                       | 0  | 0  |
| 7:30 PM                       | 0  | 0  |
| 7:45 PM                       | 0  | 0  |
| 8:00 PM                       | 0  | 0  |

**Built-up Isolated Community With Less Than 10,000 Population or Above 35 MPH on Major Street?**

**15th Percentile Pedestrian Crossing Speed Less than 3.5 f/s?**   
*\*If applicable, attach all supporting calculations, documentation, and findings.*

If 15th Percentile Pedestrian Crossing Speed is Less than 3.5 f/s,  
 Reduce Criterion by (up to 50%):

**Is the distance to the nearest traffic control signal or STOP sign controlling the major street that pedestrians desire to cross less than 300 feet?**

If the distance to the nearest traffic control signal or STOP sign controlling the major street that pedestrians desire to cross is less than 300 feet, will the proposed traffic control signal restrict the progressive movement of traffic? If applicable, attach supporting justification.

**Does the intersection meet the 4-Hour Volume?**

**Does the intersection meet the Peak Hour?**

**Are the Requirements for Warrant 4 Satisfied?**

| Top Hours for Figure 4C-5 | Start Time | End Time | Vehicles | Pedestrians |
|---------------------------|------------|----------|----------|-------------|
| Top Hour                  | 2:15 PM    | 3:15 PM  | 460      | 40          |
| 2nd Highest Hour          | 3:45 PM    | 4:45 PM  | 395      | 24          |
| 3rd Highest Hour          | 7:30 AM    | 8:30 AM  | 396      | 2           |
| 4th Highest Hour          | 11:30 AM   | 12:30 PM | 363      | 17          |

| Top Hours for Figure 4C-6 | Start Time | End Time | Vehicles | Pedestrians |
|---------------------------|------------|----------|----------|-------------|
| Top Hour                  | 2:15 PM    | 3:15 PM  | 460      | 40          |
| 2nd Highest Hour          | 3:45 PM    | 4:45 PM  | 395      | 24          |
| 3rd Highest Hour          | 7:30 AM    | 8:30 AM  | 396      | 2           |
| 4th Highest Hour          | 12:45 PM   | 1:45 PM  | 342      | 31          |

Peak Hour Used for Graphs 4C-7 & 4C-8

Top Hour

| Start Time | End Time | Vehicles | Pedestrians |
|------------|----------|----------|-------------|
| 2:15 PM    | 3:15 PM  | 460      | 40          |

Number of Hours That Met the 4-Hour Criteria 4C-5

Number of Hours That Met the 4-Hour Criteria 4C-6

Figure 4C-5. Warrant 4, Pedestrians Four-Hour Volume

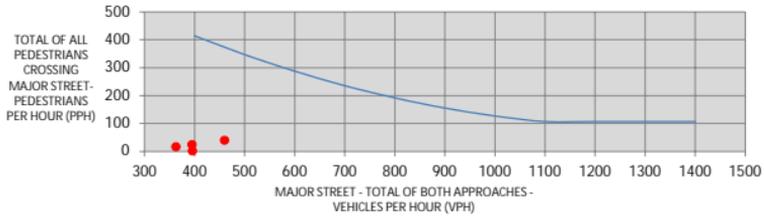


Figure 4C-6. Warrant 4, Pedestrian Four Hour Volume (70% Factor)

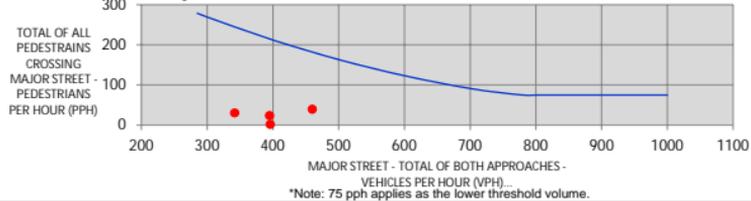
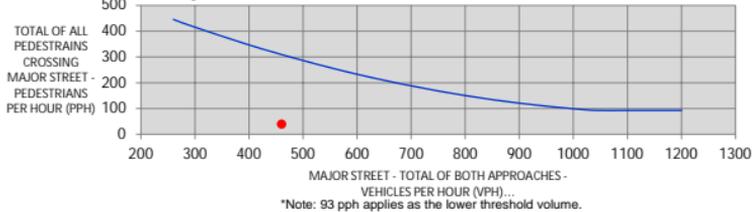


Figure 4C-7. Warrant 4, Pedestrian Peak Hour



Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



## STUDY AND ANALYSIS INFORMATION

|                                   |                     |  |                         |
|-----------------------------------|---------------------|--|-------------------------|
| <b>Municipality:</b>              | Stubenville         | <b>Traffic Volumes Obtained By:</b>                      | Smart Services          |
| <b>County:</b>                    | Jefferson           | <b>Analysis Date:</b>                                    | 11/7/2024               |
| <b>ODOT Engineering District:</b> | 11                  | <b>Agency/ Company Name Performing Warrant Analysis:</b> | Strand Associates, Inc. |
| <b>Google map link:</b>           | <a href="#">Map</a> |  |                         |

### Analysis Information

**Data Collection Date:** 9/10/2024  
**Day of the Week:** Tuesday

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Existing Traffic Signal at intersection: Yes

Total Number of Approaches at Intersection: 3

### Major Street Information

Major Street Name and Route Number: Washington St

Major Street Approach Direction: E-Bound  
W-Bound

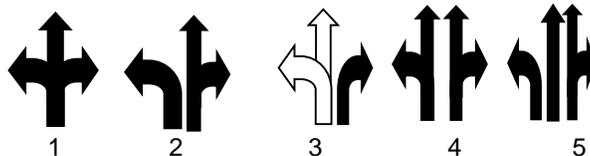
Number of Thru Lanes on Each Major Street Approach: 2 LANE(S)

Speed Limit or 85th Percentile Speed on the Major Street\*: 25 MPH  
\*Unknown assumes below 45 mph

### Minor Street Information

Minor Street Name and Route Number: 5th St

Minor Street Approach Configuration: 3 N-Bound  
S-Bound



Number of Thru Lanes on Each Minor Street Approach: 1 LANE(S)

Apply Right Turn Lane Reduction\*: Yes

\*Right Turn Lane Reduction Shall be used for Warrants 1, 2, & 3 for New ODOT Signals. Please refer to TEM 402-3.2 for clarification and criteria under which Right Turn Reduction is not required.

**TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS**

|  | Warrant     |            | Notes and Comments:  |           |         |         |
|--|-------------|------------|--|-----------|---------|---------|
|  | Applicable? | Satisfied? |  |           |         |         |
| Warrant 1, Eight-Hour Vehicular Volume   | Yes         | No         |  |           |         |         |
| Warrant 2, Four-Hour Vehicular Volume  | Yes         | No         |  |           |         |         |
| Warrant 3, Peak Hour   | Yes         | No         | Signals installed under Warrant 3 should be traffic actuated.<br><table border="1" style="float: right;"> <tr><td>Peak Hour</td></tr> <tr><td>2:15 PM</td></tr> <tr><td>3:15 PM</td></tr> </table>   | Peak Hour | 2:15 PM | 3:15 PM |
| Peak Hour  |             |            |  |           |         |         |
| 2:15 PM  |             |            |  |           |         |         |
| 3:15 PM  |             |            |  |           |         |         |
| For Warrants 1-3, new ODOT signals must be based off of 100% volume thresholds (TEM 402-3.2) |             |            |  |           |         |         |
| Warrant 4, Pedestrian Volume   | Yes         | No         | If this warrant is met, and a traffic control signal is justified by an engineering study, the traffic control signal shall be equipped with pedestrian signal heads complying with the provisions set forth in Chapter 4E of the OMUTCD.<br><table border="1" style="float: right;"> <tr><td>Peak Hour</td></tr> <tr><td>2:15 PM</td></tr> <tr><td>3:15 PM</td></tr> </table> | Peak Hour | 2:15 PM | 3:15 PM |
| Peak Hour  |             |            |  |           |         |         |
| 2:15 PM  |             |            |  |           |         |         |
| 3:15 PM  |             |            |  |           |         |         |
| Warrant 5, School Crossing   | No          |            | N/A  |           |         |         |
| Warrant 6, Coordinated Signal System   | No          |            | (Shall not be used as the sole warrant in the analysis)  |           |         |         |
| Warrant 7, Crash Experience  | No          |            | If this is the sole warrant, signal must be semi-actuated with control devices which provide proper coordination if installed at an intersection within a coordinated system and normally should be fully traffic actuated if installed at an isolated intersection.   |           |         |         |
| Warrant 8, Roadway Network   | No          |            | (Shall not be used as the sole warrant in the analysis)  |           |         |         |
| Warrant 9, Intersection Near a Grade Crossing  | No          |            | Figure 4C-9  |           |         |         |
| Multi-Way Stop Warrant   | Yes         | Yes        | May be used as an interim measure if traffic signal warrants are satisfied.  |           |         |         |

**The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.**

|   |
|---|
| If no warrants are satisfied, additional options may be considered:   |
| 1. An engineering study, performed by a firm prequalified by ODOT for signal design, if approved by the ODOT district, may be used to justify a new signal installation or retention of an existing signal that otherwise does not meet the published warrants. An example of such an instance is a traffic signal in proximity to a railroad crossing that serves to reduce queuing across the tracks.     |
| 2. According to TEM 402-2, If the actual turning movement counts fail to satisfy a signal warrant, it may be acceptable to use traffic volumes projected to the second year after project completion. The <b>Modeling and Forecasting Section</b> should provide the projected traffic volumes.   |
| 3. A pedestrian hybrid beacon may be considered for installation to facilitate pedestrian crossings at a location that does not meet traffic signal warrants (see Chapter 4C of TEM) or at a location that meets traffic signal warrants under Sections 4C.05 and/or 4C.06 but a decision is made to not install a traffic control signal. <b>Please fill inputs on PHB Score Sheet and submit to ODOT.</b> |

Considerations such as geometrics and lack of sight distance generally have not been accepted in lieu of satisfying signal warrants. These considerations may allow an otherwise unwarranted traffic signal to be retained at **100 percent** local cost. Please review TEM 402-4 for details.

Conclusion: **Do Not Retain Existing Traffic Signal**

Notes:

## OMUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

**Number of Lanes for Moving Traffic on Each Approach**

**Major Street:** 2 or More Lanes

**Minor Street:** 1 Lane

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? No

*\*Only applicable after an adequate trial of other alternatives (See section 4C.02.06 of the 2012 OMUTCD)*

| Lanes Major/Minor | Adjusted Volumes |       | Condition A |      |      |      | Condition B |      |      |      | Combination A/B* |      |      |      |      |      |      |      |
|-------------------|------------------|-------|-------------|------|------|------|-------------|------|------|------|------------------|------|------|------|------|------|------|------|
|                   |                  |       | 100%        |      | 70%  |      | 100%        |      | 70%  |      | 80%              |      | 80%  |      | 56%  |      | 56%  |      |
|                   | Major            | Minor | Maj.        | Min. | Maj. | Min. | Maj.        | Min. | Maj. | Min. | Maj.             | Min. | Maj. | Min. | Maj. | Min. | Maj. | Min. |
| 1 / 1             |                  |       | 500         | 150  | 350  | 105  | 750         | 75   | 525  | 53   | 400              | 120  | 600  | 60   | 280  | 84   | 420  | 42   |
| 2+ / 1            | X                |       | 600         | 150  | 420  | 105  | 900         | 75   | 630  | 53   | 480              | 120  | 720  | 60   | 336  | 84   | 504  | 42   |
| 2+ / 2+           |                  |       | 600         | 200  | 420  | 140  | 900         | 100  | 630  | 70   | 480              | 160  | 720  | 80   | 336  | 112  | 504  | 56   |
| 1 / 2+            |                  |       | 500         | 200  | 350  | 140  | 750         | 100  | 525  | 70   | 400              | 160  | 600  | 80   | 280  | 112  | 420  | 56   |
| 12:00 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:15 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:30 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:45 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:15 AM           | 53               | 3     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:30 AM           | 131              | 9     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:45 AM           | 236              | 18    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:00 AM           | 363              | 37    |             |      |      |      |             |      |      |      |                  |      |      |      | 1    |      |      |      |
| 7:15 AM           | 403              | 50    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:30 AM           | 426              | 54    |             |      |      | 1    |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:45 AM           | 416              | 66    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:00 AM           | 357              | 59    |             |      |      |      |             |      |      |      |                  |      |      |      | 1    |      |      |      |
| 8:15 AM           | 338              | 54    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:30 AM           | 318              | 51    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:45 AM           | 288              | 44    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:00 AM           | 306              | 44    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:15 AM           | 320              | 43    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:30 AM           | 323              | 49    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:45 AM           | 338              | 44    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:00 AM          | 338              | 46    |             |      |      |      |             |      |      |      |                  |      |      |      | 1    |      |      |      |
| 10:15 AM          | 351              | 41    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |



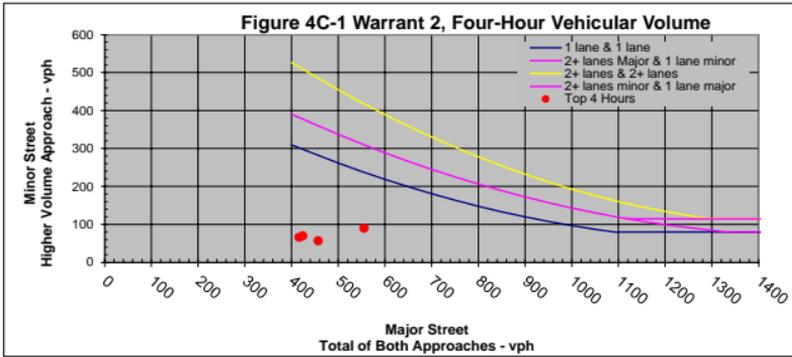
**OMUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME**

|   |   |   |
|---|---|---|
| Number of Lanes for Moving Traffic on Each Approach | Total Number of Unique Hours Met on Figure 4C-1 | 0 |
|---|---|---|

|                               |  |   |
|-------------------------------|--|---|
| Major street: 2 or More Lanes | Total Number of Unique Hours Met on Figure 4C-2 (70% Factor) | 0 |
| Minor Street: 1 Lane          |  |   |

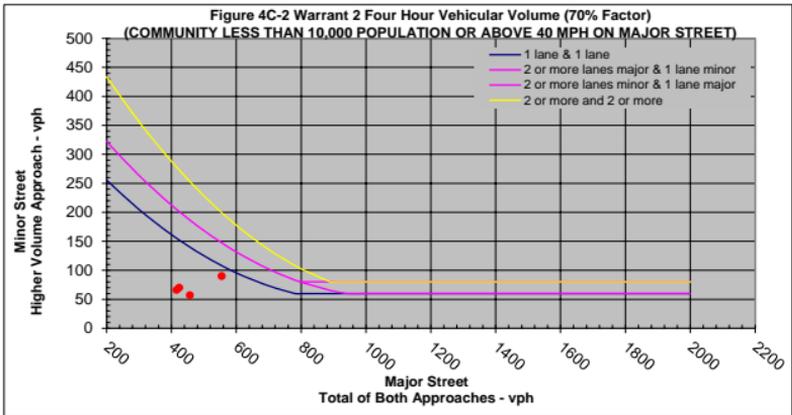
|   |    |
|---|----|
| Build up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? | No |
|---|----|

| Hour Interval Beginning At | Raw Traffic Counts |         |                       |         | Total Major Approach Volumes | Highest Actual Minor Street Approach Volumes | Hour Met? | Hour Met? (70% Factor) |
|----------------------------|--------------------|---------|-----------------------|---------|------------------------------|--|-----------|------------------------|
|                            | Minor - 5th St     |         | Major - Washington St |         |                              |  |           |                        |
|                            | N-Bound            | S-Bound | W-Bound               | E-Bound |                              |  |           |                        |
| 6:00 AM                    | 0                  | 0       | 0                     | 0       | 0                            | 0  |           |                        |
| 6:15 AM                    | 0                  | 3       | 25                    | 28      | 53                           | 3  |           |                        |
| 6:30 AM                    | 0                  | 9       | 69                    | 62      | 131                          | 9  |           |                        |
| 6:45 AM                    | 0                  | 18      | 131                   | 105     | 236                          | 18   |           |                        |
| 7:00 AM                    | 0                  | 37      | 194                   | 169     | 363                          | 37   |           |                        |
| 7:15 AM                    | 0                  | 50      | 211                   | 192     | 403                          | 50   |           |                        |
| 7:30 AM                    | 0                  | 54      | 209                   | 217     | 426                          | 54   |           |                        |
| 7:45 AM                    | 0                  | 66      | 202                   | 214     | 416                          | 66   |           |                        |
| 8:00 AM                    | 0                  | 59      | 181                   | 176     | 357                          | 59   |           |                        |
| 8:15 AM                    | 1                  | 54      | 177                   | 161     | 338                          | 54   |           |                        |
| 8:30 AM                    | 1                  | 51      | 179                   | 139     | 318                          | 51   |           |                        |
| 8:45 AM                    | 1                  | 44      | 165                   | 123     | 288                          | 44   |           |                        |
| 9:00 AM                    | 1                  | 44      | 168                   | 138     | 306                          | 44   |           |                        |
| 9:15 AM                    | 0                  | 43      | 178                   | 142     | 320                          | 43   |           |                        |
| 9:30 AM                    | 0                  | 49      | 178                   | 145     | 323                          | 49   |           |                        |
| 9:45 AM                    | 0                  | 44      | 184                   | 154     | 338                          | 44   |           |                        |
| 10:00 AM                   | 0                  | 46      | 193                   | 145     | 338                          | 46   |           |                        |
| 10:15 AM                   | 0                  | 41      | 204                   | 147     | 351                          | 41   |           |                        |
| 10:30 AM                   | 0                  | 41      | 217                   | 149     | 366                          | 41   |           |                        |
| 10:45 AM                   | 1                  | 51      | 218                   | 164     | 382                          | 51   |           |                        |
| 11:00 AM                   | 1                  | 55      | 218                   | 180     | 398                          | 55   |           |                        |
| 11:15 AM                   | 1                  | 67      | 220                   | 194     | 414                          | 67   |           |                        |
| 11:30 AM                   | 1                  | 70      | 229                   | 195     | 424                          | 70   |           |                        |
| 11:45 AM                   | 1                  | 66      | 224                   | 197     | 421                          | 66   |           |                        |
| 12:00 PM                   | 1                  | 63      | 228                   | 194     | 422                          | 63   |           |                        |
| 12:15 PM                   | 1                  | 59      | 224                   | 190     | 414                          | 59   |           |                        |
| 12:30 PM                   | 1                  | 53      | 206                   | 194     | 400                          | 53   |           |                        |
| 12:45 PM                   | 0                  | 55      | 240                   | 182     | 422                          | 55   |           |                        |
| 1:00 PM                    | 0                  | 48      | 241                   | 173     | 414                          | 48   |           |                        |
| 1:15 PM                    | 0                  | 45      | 241                   | 176     | 417                          | 45   |           |                        |
| 1:30 PM                    | 0                  | 51      | 268                   | 182     | 450                          | 51   |           |                        |
| 1:45 PM                    | 0                  | 76      | 284                   | 206     | 490                          | 76   |           |                        |
| 2:00 PM                    | 0                  | 90      | 307                   | 227     | 534                          | 90   |           |                        |
| 2:15 PM                    | 0                  | 90      | 312                   | 243     | 555                          | 90   |           |                        |
| 2:30 PM                    | 0                  | 88      | 295                   | 237     | 532                          | 88   |           |                        |
| 2:45 PM                    | 1                  | 61      | 258                   | 214     | 472                          | 61   |           |                        |
| 3:00 PM                    | 1                  | 52      | 240                   | 213     | 453                          | 52   |           |                        |
| 3:15 PM                    | 1                  | 57      | 248                   | 186     | 434                          | 57   |           |                        |
| 3:30 PM                    | 1                  | 56      | 239                   | 187     | 426                          | 56   |           |                        |
| 3:45 PM                    | 0                  | 57      | 257                   | 200     | 457                          | 57   |           |                        |
| 4:00 PM                    | 0                  | 53      | 254                   | 188     | 442                          | 53   |           |                        |
| 4:15 PM                    | 0                  | 49      | 228                   | 181     | 409                          | 49   |           |                        |
| 4:30 PM                    | 0                  | 46      | 230                   | 175     | 405                          | 46   |           |                        |
| 4:45 PM                    | 0                  | 45      | 206                   | 163     | 369                          | 45   |           |                        |
| 5:00 PM                    | 0                  | 51      | 175                   | 149     | 324                          | 51   |           |                        |
| 5:15 PM                    | 0                  | 49      | 171                   | 151     | 322                          | 49   |           |                        |
| 5:30 PM                    | 0                  | 50      | 147                   | 147     | 294                          | 50   |           |                        |
| 5:45 PM                    | 0                  | 45      | 132                   | 147     | 279                          | 45   |           |                        |
| 6:00 PM                    | 0                  | 37      | 127                   | 157     | 284                          | 37   |           |                        |
| 6:15 PM                    | 0                  | 28      | 87                    | 118     | 205                          | 28   |           |                        |
| 6:30 PM                    | 0                  | 16      | 60                    | 80      | 140                          | 16   |           |                        |
| 6:45 PM                    | 0                  | 7       | 25                    | 40      | 65                           | 7  |           |                        |
| 7:00 PM                    | 0                  | 0       | 0                     | 0       | 0                            | 0  |           |                        |
| 7:15 PM                    | 0                  | 0       | 0                     | 0       | 0                            | 0  |           |                        |
| 7:30 PM                    | 0                  | 0       | 0                     | 0       | 0                            | 0  |           |                        |
| 7:45 PM                    | 0                  | 0       | 0                     | 0       | 0                            | 0  |           |                        |
| 8:00 PM                    | 0                  | 0       | 0                     | 0       | 0                            | 0  |           |                        |



| Top Hours for Figure 4C-1 |            |          |              |              |  |
|---------------------------|------------|----------|--------------|--------------|--|
|                           | Start Time | End Time | Major Street | Minor Street |  |
| Top Hour                  | 2:15 PM    | 3:15 PM  | 555          | 90           |  |
| 2nd Highest Hour          | 3:45 PM    | 4:45 PM  | 457          | 57           |  |
| 3rd Highest Hour          | 11:30 AM   | 12:30 PM | 424          | 70           |  |
| 4th Highest Hour          | 7:45 AM    | 8:45 AM  | 416          | 66           |  |

| Top Hours for Figure 4C-2 |            |          |              |              |  |
|---------------------------|------------|----------|--------------|--------------|--|
|                           | Start Time | End Time | Major Street | Minor Street |  |
| Top Hour                  | 2:15 PM    | 3:15 PM  | 655          | 90           |  |
| 2nd Highest Hour          | 3:45 PM    | 4:45 PM  | 457          | 57           |  |
| 3rd Highest Hour          | 11:30 AM   | 12:30 PM | 424          | 70           |  |
| 4th Highest Hour          | 7:45 AM    | 8:45 AM  | 416          | 66           |  |



Are the requirements for Warrant 2 met?:  No

### OMUTCD WARRANT 3, PEAK HOUR

|   |                      |         |
|---|----------------------|---------|
| Number of Lanes for Moving Traffic on Each Approach | Peak Hour Start time | 2:15 PM |
| Major Street: 2 or More Lanes                       | Peak Hour End Time   | 3:15 PM |
| Minor Street: 1 Lane                                |                      |         |

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street?

No

Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?

No

**Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present\***

Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?

Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?

No

Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?

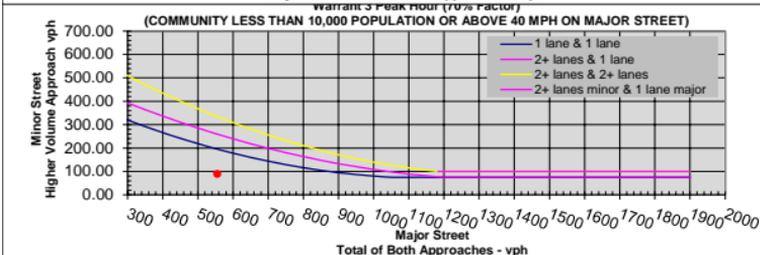
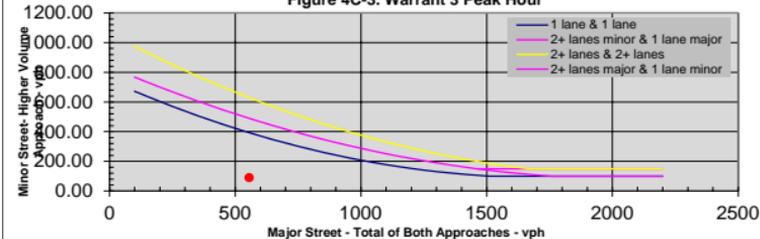
No

\*If applicable, attach all supporting calculations and documentation.

Are the requirements for Warrant 3 met?:

No

**Figure 4C-3. Warrant 3 Peak Hour**



| Hour Vehicular Volume      |   |   |  |   |
|----------------------------|---|---|--|---|
| Hour Interval Beginning At | Major Street Combined Vehicles Per Hour (VPH) | Highest Minor Street Approach Vehicles Per Hour (VPH) | Sum of Major Street and Highest Minor Street | Sum of Major Street and Combined Minor Street |
| 6:00 AM                    | 0   | 0   | 0  | 0   |
| 6:15 AM                    | 53  | 3   | 56   | 56  |
| 6:30 AM                    | 131   | 9   | 140  | 140   |
| 6:45 AM                    | 236   | 18  | 254  | 254   |
| 7:00 AM                    | 363   | 37  | 400  | 400   |
| 7:15 AM                    | 403   | 50  | 453  | 453   |
| 7:30 AM                    | 426   | 54  | 480  | 480   |
| 7:45 AM                    | 416   | 66  | 482  | 482   |
| 8:00 AM                    | 357   | 59  | 416  | 416   |
| 8:15 AM                    | 338   | 54  | 392  | 393   |
| 8:30 AM                    | 318   | 51  | 369  | 370   |
| 8:45 AM                    | 288   | 44  | 332  | 333   |
| 9:00 AM                    | 306   | 44  | 350  | 351   |
| 9:15 AM                    | 320   | 43  | 363  | 363   |
| 9:30 AM                    | 323   | 49  | 372  | 372   |
| 9:45 AM                    | 338   | 44  | 382  | 382   |
| 10:00 AM                   | 338   | 46  | 384  | 384   |
| 10:15 AM                   | 351   | 41  | 392  | 392   |
| 10:30 AM                   | 366   | 41  | 407  | 407   |
| 10:45 AM                   | 382   | 51  | 433  | 434   |
| 11:00 AM                   | 398   | 55  | 453  | 454   |
| 11:15 AM                   | 414   | 67  | 481  | 482   |
| 11:30 AM                   | 424   | 70  | 494  | 495   |
| 11:45 AM                   | 421   | 66  | 487  | 488   |
| 12:00 PM                   | 422   | 63  | 485  | 486   |
| 12:15 PM                   | 414   | 59  | 473  | 474   |
| 12:30 PM                   | 400   | 53  | 453  | 454   |
| 12:45 PM                   | 422   | 55  | 477  | 477   |
| 1:00 PM                    | 414   | 48  | 462  | 462   |
| 1:15 PM                    | 417   | 45  | 462  | 462   |
| 1:30 PM                    | 450   | 51  | 501  | 501   |
| 1:45 PM                    | 490   | 76  | 566  | 566   |
| 2:00 PM                    | 534   | 90  | 624  | 624   |
| 2:15 PM                    | 555   | 90  | 645  | 645   |
| 2:30 PM                    | 532   | 88  | 620  | 620   |
| 2:45 PM                    | 472   | 61  | 533  | 534   |
| 3:00 PM                    | 453   | 52  | 505  | 506   |
| 3:15 PM                    | 434   | 57  | 491  | 492   |
| 3:30 PM                    | 426   | 56  | 482  | 483   |
| 3:45 PM                    | 457   | 57  | 514  | 514   |
| 4:00 PM                    | 442   | 53  | 495  | 495   |
| 4:15 PM                    | 409   | 49  | 458  | 458   |
| 4:30 PM                    | 405   | 46  | 451  | 451   |
| 4:45 PM                    | 369   | 45  | 414  | 414   |
| 5:00 PM                    | 324   | 51  | 375  | 375   |
| 5:15 PM                    | 322   | 49  | 371  | 371   |
| 5:30 PM                    | 294   | 50  | 344  | 344   |
| 5:45 PM                    | 279   | 45  | 324  | 324   |
| 6:00 PM                    | 284   | 37  | 321  | 321   |
| 6:15 PM                    | 205   | 28  | 233  | 233   |
| 6:30 PM                    | 140   | 16  | 156  | 156   |
| 6:45 PM                    | 65  | 7   | 72   | 72  |
| 7:00 PM                    | 0   | 0   | 0  | 0   |
| 7:15 PM                    | 0   | 0   | 0  | 0   |
| 7:30 PM                    | 0   | 0   | 0  | 0   |
| 7:45 PM                    | 0   | 0   | 0  | 0   |
| 8:00 PM                    | 0   | 0   | 0  | 0   |

| Actual Peak Hour Major Traffic Volume | Actual Peak Hour Minor Traffic Volume | Required Peak Hour Minor Traffic Volume for Fig. 4C-3 | Required Peak Hour Minor Traffic Volume for Fig. 4C-4 |
|---------------------------------------|---------------------------------------|---|---|
| 555                                   | 90                                    | 490   | 260   |

## OMUTCD WARRANT 4, PEDESTRIAN VOLUME

| Hour Interval Beginning At | Major Street Combined Vehicles Per Hour (VPH) | Total of All Pedestrians Crossing Major Street Pedestrians Per Hour (PPH) |  |
|----------------------------|---|---|--|
| 6:00 AM                    | 0   | 0   | <b>Built-up Isolated Community With Less Than 10,000 Population or Above 35 MPH on Major Street?</b> <span style="float: right; background-color: #90EE90; padding: 2px;">No</span>  |
| 6:15 AM                    | 53  | 1   |  |
| 6:30 AM                    | 131   | 2   |  |
| 6:45 AM                    | 236   | 4   |  |
| 7:00 AM                    | 363   | 5   |  |
| 7:15 AM                    | 403   | 5   |  |
| 7:30 AM                    | 426   | 8   |  |
| 7:45 AM                    | 416   | 7   |  |
| 8:00 AM                    | 357   | 7   |  |
| 8:15 AM                    | 338   | 8   |  |
| 8:30 AM                    | 318   | 5   |  |
| 8:45 AM                    | 288   | 9   |  |
| 9:00 AM                    | 306   | 11  |  |
| 9:15 AM                    | 320   | 12  |  |
| 9:30 AM                    | 323   | 16  |  |
| 9:45 AM                    | 338   | 12  |  |
| 10:00 AM                   | 338   | 9   | <b>15th Percentile Pedestrian Crossing Speed Less than 3.5 f/s?*</b> <span style="float: right; background-color: #90EE90; padding: 2px;">No</span><br><i>*If applicable, attach all supporting calculations, documentation, and findings.</i> |
| 10:15 AM                   | 351   | 10  |  |
| 10:30 AM                   | 366   | 5   |  |
| 10:45 AM                   | 382   | 7   |  |
| 11:00 AM                   | 398   | 9   |  |
| 11:15 AM                   | 414   | 7   |  |
| 11:30 AM                   | 424   | 11  |  |
| 11:45 AM                   | 421   | 11  |  |
| 12:00 PM                   | 422   | 11  |  |
| 12:15 PM                   | 414   | 9   |  |
| 12:30 PM                   | 400   | 8   |  |
| 12:45 PM                   | 422   | 5   |  |
| 1:00 PM                    | 414   | 3   |  |
| 1:15 PM                    | 417   | 8   |  |
| 1:30 PM                    | 450   | 6   |  |
| 1:45 PM                    | 490   | 8   |  |
| 2:00 PM                    | 534   | 8   |  |
| 2:15 PM                    | 555   | 9   |  |
| 2:30 PM                    | 532   | 11  |  |
| 2:45 PM                    | 472   | 9   |  |
| 3:00 PM                    | 453   | 13  |  |
| 3:15 PM                    | 434   | 10  |  |
| 3:30 PM                    | 426   | 8   |  |
| 3:45 PM                    | 457   | 10  |  |
| 4:00 PM                    | 442   | 7   |  |
| 4:15 PM                    | 409   | 8   |  |
| 4:30 PM                    | 405   | 7   |  |
| 4:45 PM                    | 369   | 7   |  |
| 5:00 PM                    | 324   | 7   |  |
| 5:15 PM                    | 322   | 6   |  |
| 5:30 PM                    | 294   | 8   |  |
| 5:45 PM                    | 279   | 7   |  |
| 6:00 PM                    | 284   | 6   |  |
| 6:15 PM                    | 205   | 3   |  |
| 6:30 PM                    | 140   | 1   |  |
| 6:45 PM                    | 65  | 0   |  |
| 7:00 PM                    | 0   | 0   |  |
| 7:15 PM                    | 0   | 0   |  |
| 7:30 PM                    | 0   | 0   |  |
| 7:45 PM                    | 0   | 0   |  |
| 8:00 PM                    | 0   | 0   |  |

| Top Hours for Figure 4C-5 | Start Time | End Time | Vehicles | Pedestrians |
|---------------------------|------------|----------|----------|-------------|
| Top Hour                  | 2:15 PM    | 3:15 PM  | 555      | 9           |
| 2nd Highest Hour          | 3:45 PM    | 4:45 PM  | 457      | 10          |
| 3rd Highest Hour          | 11:30 AM   | 12:30 PM | 424      | 11          |
| 4th Highest Hour          | 7:30 AM    | 8:30 AM  | 426      | 8           |

| Top Hours for Figure 4C-6 | Start Time | End Time | Vehicles | Pedestrians |
|---------------------------|------------|----------|----------|-------------|
| Top Hour                  | 2:15 PM    | 3:15 PM  | 555      | 9           |
| 2nd Highest Hour          | 3:45 PM    | 4:45 PM  | 457      | 10          |
| 3rd Highest Hour          | 11:30 AM   | 12:30 PM | 424      | 11          |
| 4th Highest Hour          | 7:30 AM    | 8:30 AM  | 426      | 8           |

| Peak Hour Used for Graphs 4C-7 & 4C-8 |          |          |             |  |
|---------------------------------------|----------|----------|-------------|--|
| Top Hour                              |          |          |             |  |
| Start Time                            | End Time | Vehicles | Pedestrians |  |
| 2:15 PM                               | 3:15 PM  | 555      | 9           |  |

|   |   |
|---|---|
| Number of Hours That Met the 4-Hour Criteria 4C-5 | 0 |
|---|---|

|   |   |
|---|---|
| Number of Hours That Met the 4-Hour Criteria 4C-6 | 0 |
|---|---|

Figure 4C-5. Warrant 4, Pedestrians Four-Hour Volume

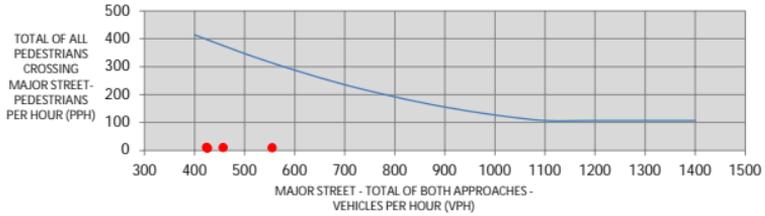


Figure 4C-6. Warrant 4, Pedestrian Four Hour Volume (70% Factor)

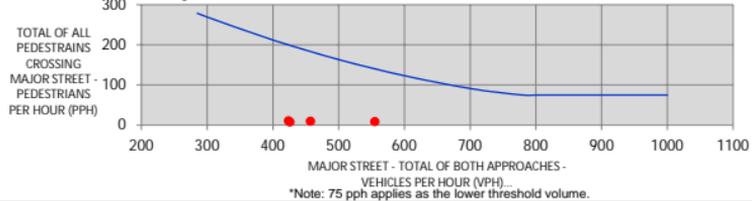
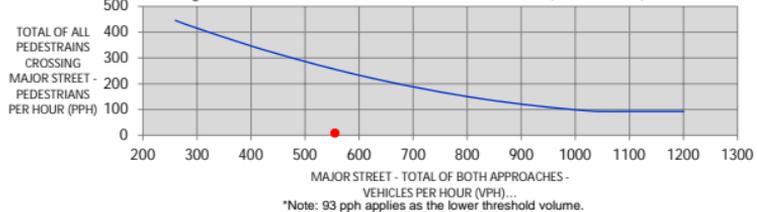


Figure 4C-7. Warrant 4, Pedestrian Peak Hour



Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



## STUDY AND ANALYSIS INFORMATION

|                                   |                     |  |                         |
|-----------------------------------|---------------------|--|-------------------------|
| <b>Municipality:</b>              | Stubenville         | <b>Traffic Volumes Obtained By:</b>                      | Smart Services          |
| <b>County:</b>                    | Jefferson           | <b>Analysis Date:</b>                                    | 11/7/2024               |
| <b>ODOT Engineering District:</b> | 11                  | <b>Agency/ Company Name Performing Warrant Analysis:</b> | Strand Associates, Inc. |
| <b>Google map link:</b>           | <a href="#">Map</a> |  |                         |

### Analysis Information

**Data Collection Date:** 9/10/2024  
**Day of the Week:** Tuesday

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Existing Traffic Signal at intersection: Yes

Total Number of Approaches at Intersection: 4

### Major Street Information

Major Street Name and Route Number: Washington St

Major Street Approach Direction: E-Bound  
W-Bound

Number of Thru Lanes on Each Major Street Approach: 2 LANE(S)

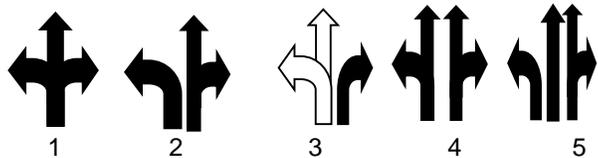
Speed Limit or 85th Percentile Speed on the Major Street\*: 25 MPH  
\*Unknown assumes below 45 mph

### Minor Street Information

Minor Street Name and Route Number: 7th St

Minor Street Approach Configuration: 

|   |         |
|---|---------|
| 1 | N-Bound |
| 2 | S-Bound |



Number of Thru Lanes on Each Minor Street Approach: 1 LANE(S)  
 Apply Right Turn Lane Reduction\*: Yes

\*Right Turn Lane Reduction Shall be used for Warrants 1, 2, & 3 for New ODOT Signals. Please refer to TEM 402-3.2 for clarification and criteria under which Right Turn Reduction is not required.

**TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS**

|  | Warrant     |            | Notes and Comments:  |           |         |         |
|--|-------------|------------|--|-----------|---------|---------|
|  | Applicable? | Satisfied? |  |           |         |         |
| Warrant 1, Eight-Hour Vehicular Volume   | Yes         | No         |  |           |         |         |
| Warrant 2, Four-Hour Vehicular Volume  | Yes         | No         |  |           |         |         |
| Warrant 3, Peak Hour   | Yes         | No         | Signals installed under Warrant 3 should be traffic actuated.<br><table border="1" style="float: right;"> <tr><td>Peak Hour</td></tr> <tr><td>2:15 PM</td></tr> <tr><td>3:15 PM</td></tr> </table>   | Peak Hour | 2:15 PM | 3:15 PM |
| Peak Hour  |             |            |  |           |         |         |
| 2:15 PM  |             |            |  |           |         |         |
| 3:15 PM  |             |            |  |           |         |         |
| For Warrants 1-3, new ODOT signals must be based off of 100% volume thresholds (TEM 402-3.2) |             |            |  |           |         |         |
| Warrant 4, Pedestrian Volume   | Yes         | No         | If this warrant is met, and a traffic control signal is justified by an engineering study, the traffic control signal shall be equipped with pedestrian signal heads complying with the provisions set forth in Chapter 4E of the OMUTCD.<br><table border="1" style="float: right;"> <tr><td>Peak Hour</td></tr> <tr><td>2:15 PM</td></tr> <tr><td>3:15 PM</td></tr> </table> | Peak Hour | 2:15 PM | 3:15 PM |
| Peak Hour  |             |            |  |           |         |         |
| 2:15 PM  |             |            |  |           |         |         |
| 3:15 PM  |             |            |  |           |         |         |
| Warrant 5, School Crossing   | No          |            | N/A  |           |         |         |
| Warrant 6, Coordinated Signal System   | No          |            | (Shall not be used as the sole warrant in the analysis)  |           |         |         |
| Warrant 7, Crash Experience  | No          |            | If this is the sole warrant, signal must be semi-actuated with control devices which provide proper coordination if installed at an intersection within a coordinated system and normally should be fully traffic actuated if installed at an isolated intersection.   |           |         |         |
| Warrant 8, Roadway Network   | No          |            | (Shall not be used as the sole warrant in the analysis)  |           |         |         |
| Warrant 9, Intersection Near a Grade Crossing  | No          |            | Figure 4C-9  |           |         |         |
| Multi-Way Stop Warrant   | Yes         | Yes        | May be used as an interim measure if traffic signal warrants are satisfied.  |           |         |         |

**The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.**

|   |
|---|
| If no warrants are satisfied, additional options may be considered:   |
| 1. An engineering study, performed by a firm prequalified by ODOT for signal design, if approved by the ODOT district, may be used to justify a new signal installation or retention of an existing signal that otherwise does not meet the published warrants. An example of such an instance is a traffic signal in proximity to a railroad crossing that serves to reduce queuing across the tracks.     |
| 2. According to TEM 402-2, If the actual turning movement counts fail to satisfy a signal warrant, it may be acceptable to use traffic volumes projected to the second year after project completion. The <b>Modeling and Forecasting Section</b> should provide the projected traffic volumes.   |
| 3. A pedestrian hybrid beacon may be considered for installation to facilitate pedestrian crossings at a location that does not meet traffic signal warrants (see Chapter 4C of TEM) or at a location that meets traffic signal warrants under Sections 4C.05 and/or 4C.06 but a decision is made to not install a traffic control signal. <b>Please fill inputs on PHB Score Sheet and submit to ODOT.</b> |

Considerations such as geometrics and lack of sight distance generally have not been accepted in lieu of satisfying signal warrants. These considerations may allow an otherwise unwarranted traffic signal to be retained at **100 percent** local cost. Please review TEM 402-4 for details.

Conclusion: Retain Existing Traffic Signal

Notes:

## OMUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

**Number of Lanes for Moving Traffic on Each Approach**

**Major Street:** 2 or More Lanes

**Minor Street:** 1 Lane

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? No

*\*Only applicable after an adequate trial of other alternatives (See section 4C.02.06 of the 2012 OMUTCD)*

| Lanes Major/Minor | Adjusted Volumes |       | Condition A |      |      |      | Condition B |      |      |      | Combination A/B* |      |      |      |      |      |      |      |
|-------------------|------------------|-------|-------------|------|------|------|-------------|------|------|------|------------------|------|------|------|------|------|------|------|
|                   |                  |       | 100%        |      | 70%  |      | 100%        |      | 70%  |      | 80%              |      | 80%  |      | 56%  |      | 56%  |      |
|                   | Major            | Minor | Maj.        | Min. | Maj. | Min. | Maj.        | Min. | Maj. | Min. | Maj.             | Min. | Maj. | Min. | Maj. | Min. | Maj. | Min. |
| 1 / 1             |                  |       | 500         | 150  | 350  | 105  | 750         | 75   | 525  | 53   | 400              | 120  | 600  | 60   | 280  | 84   | 420  | 42   |
| 2+ / 1            | X                |       | 600         | 150  | 420  | 105  | 900         | 75   | 630  | 53   | 480              | 120  | 720  | 60   | 336  | 84   | 504  | 42   |
| 2+ / 2+           |                  |       | 600         | 200  | 420  | 140  | 900         | 100  | 630  | 70   | 480              | 160  | 720  | 80   | 336  | 112  | 504  | 56   |
| 1 / 2+            |                  |       | 500         | 200  | 350  | 140  | 750         | 100  | 525  | 70   | 400              | 160  | 600  | 80   | 280  | 112  | 420  | 56   |
| 12:00 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:15 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:30 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 12:45 AM          | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 1:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 2:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 3:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 4:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:15 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:30 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 5:45 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:00 AM           | 0                | 0     |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:15 AM           | 64               | 11    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:30 AM           | 168              | 28    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 6:45 AM           | 319              | 58    |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:00 AM           | 473              | 93    |             |      | 1    |      |             |      |      |      |                  |      |      | 1    | 1    |      |      |      |
| 7:15 AM           | 520              | 120   |             |      |      |      |             |      |      |      |                  | 1    | 1    |      |      |      | 1    | 1    |
| 7:30 AM           | 525              | 135   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 7:45 AM           | 465              | 154   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:00 AM           | 411              | 164   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:15 AM           | 387              | 147   |             |      |      |      |             |      |      |      |                  |      |      |      | 1    | 1    |      |      |
| 8:30 AM           | 352              | 143   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 8:45 AM           | 328              | 116   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:00 AM           | 343              | 103   |             |      |      |      |             |      |      |      |                  |      |      |      | 1    | 1    |      |      |
| 9:15 AM           | 357              | 113   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:30 AM           | 371              | 113   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 9:45 AM           | 368              | 121   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |
| 10:00 AM          | 372              | 114   |             |      |      |      |             |      |      |      |                  |      |      |      |      | 1    | 1    |      |
| 10:15 AM          | 375              | 112   |             |      |      |      |             |      |      |      |                  |      |      |      |      |      |      |      |



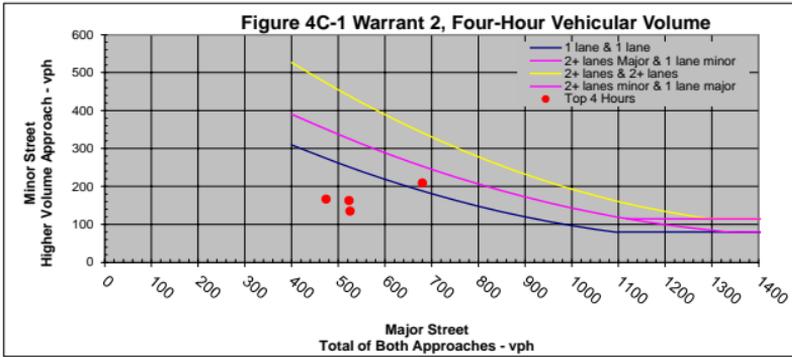
## OMUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

|  |  |          |
|--|--|----------|
| <b>Number of Lanes for Moving Traffic on Each Approach</b> | <b>Total Number of Unique Hours Met on Figure 4C-1</b> | <b>0</b> |
|--|--|----------|

|                                      |   |          |
|--------------------------------------|---|----------|
| <b>Major street: 2 or More Lanes</b> | <b>Total Number of Unique Hours Met on Figure 4C-2 (70% Factor)</b> | <b>3</b> |
| <b>Minor Street: 1 Lane</b>          |   |          |

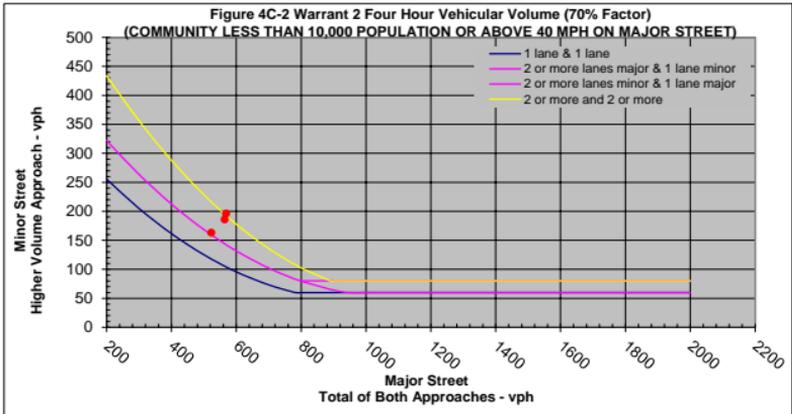
|  |           |
|--|-----------|
| <b>Build up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street?</b> | <b>No</b> |
|--|-----------|

| Hour Interval Beginning At | Raw Traffic Counts |         |                       |         | Total Major Approach Volumes | Highest Actual Minor Street Approach Volumes | Hour Met? | Hour Met? (70% Factor) |
|----------------------------|--------------------|---------|-----------------------|---------|------------------------------|--|-----------|------------------------|
|                            | Minor - 7th St     |         | Major - Washington St |         |                              |  |           |                        |
|                            | N-Bound            | S-Bound | W-Bound               | E-Bound |                              |  |           |                        |
| 6:00 AM                    | 0                  | 0       | 0                     | 0       | 0                            | 0  |           |                        |
| 6:15 AM                    | 9                  | 11      | 23                    | 41      | 64                           | 11   |           |                        |
| 6:30 AM                    | 16                 | 28      | 59                    | 109     | 168                          | 28   |           |                        |
| 6:45 AM                    | 27                 | 58      | 125                   | 194     | 319                          | 58   |           |                        |
| 7:00 AM                    | 46                 | 93      | 179                   | 294     | 473                          | 93   |           |                        |
| 7:15 AM                    | 51                 | 120     | 195                   | 325     | 520                          | 120  |           |                        |
| 7:30 AM                    | 65                 | 135     | 199                   | 326     | 525                          | 135  |           |                        |
| 7:45 AM                    | 96                 | 154     | 188                   | 297     | 485                          | 154  |           |                        |
| 8:00 AM                    | 101                | 164     | 178                   | 233     | 411                          | 164  |           |                        |
| 8:15 AM                    | 105                | 147     | 176                   | 211     | 387                          | 147  |           |                        |
| 8:30 AM                    | 99                 | 143     | 173                   | 179     | 352                          | 143  |           |                        |
| 8:45 AM                    | 69                 | 116     | 165                   | 163     | 328                          | 116  |           |                        |
| 9:00 AM                    | 63                 | 103     | 167                   | 176     | 343                          | 103  |           |                        |
| 9:15 AM                    | 68                 | 113     | 176                   | 181     | 357                          | 113  |           |                        |
| 9:30 AM                    | 79                 | 113     | 182                   | 189     | 371                          | 113  |           |                        |
| 9:45 AM                    | 89                 | 121     | 180                   | 188     | 366                          | 121  |           |                        |
| 10:00 AM                   | 97                 | 114     | 184                   | 188     | 372                          | 114  |           |                        |
| 10:15 AM                   | 98                 | 112     | 188                   | 187     | 375                          | 112  |           |                        |
| 10:30 AM                   | 97                 | 128     | 197                   | 206     | 403                          | 128  |           |                        |
| 10:45 AM                   | 98                 | 144     | 202                   | 229     | 431                          | 144  |           |                        |
| 11:00 AM                   | 109                | 156     | 197                   | 244     | 441                          | 156  |           |                        |
| 11:15 AM                   | 116                | 167     | 206                   | 268     | 474                          | 167  |           |                        |
| 11:30 AM                   | 132                | 155     | 215                   | 261     | 476                          | 155  |           |                        |
| 11:45 AM                   | 138                | 143     | 208                   | 269     | 477                          | 143  |           |                        |
| 12:00 PM                   | 130                | 138     | 219                   | 265     | 484                          | 138  |           |                        |
| 12:15 PM                   | 123                | 137     | 210                   | 243     | 453                          | 137  |           |                        |
| 12:30 PM                   | 107                | 133     | 196                   | 248     | 444                          | 133  |           |                        |
| 12:45 PM                   | 103                | 136     | 230                   | 230     | 460                          | 136  |           |                        |
| 1:00 PM                    | 103                | 144     | 229                   | 225     | 454                          | 144  |           |                        |
| 1:15 PM                    | 113                | 150     | 227                   | 233     | 460                          | 150  |           |                        |
| 1:30 PM                    | 115                | 172     | 247                   | 242     | 489                          | 172  |           |                        |
| 1:45 PM                    | 116                | 196     | 293                   | 276     | 569                          | 196  |           |                        |
| 2:00 PM                    | 116                | 200     | 315                   | 322     | 637                          | 200  |           | Met                    |
| 2:15 PM                    | 112                | 209     | 336                   | 344     | 680                          | 209  |           |                        |
| 2:30 PM                    | 120                | 205     | 330                   | 333     | 663                          | 205  |           |                        |
| 2:45 PM                    | 117                | 186     | 262                   | 302     | 564                          | 186  |           | Met                    |
| 3:00 PM                    | 118                | 185     | 247                   | 272     | 519                          | 185  |           |                        |
| 3:15 PM                    | 133                | 172     | 251                   | 244     | 495                          | 172  |           |                        |
| 3:30 PM                    | 129                | 159     | 244                   | 248     | 492                          | 159  |           |                        |
| 3:45 PM                    | 138                | 163     | 270                   | 253     | 523                          | 163  |           | Met                    |
| 4:00 PM                    | 144                | 147     | 263                   | 243     | 506                          | 147  |           |                        |
| 4:15 PM                    | 125                | 134     | 240                   | 239     | 479                          | 134  |           |                        |
| 4:30 PM                    | 128                | 130     | 237                   | 243     | 480                          | 130  |           |                        |
| 4:45 PM                    | 118                | 119     | 210                   | 229     | 439                          | 119  |           |                        |
| 5:00 PM                    | 97                 | 119     | 197                   | 209     | 406                          | 119  |           |                        |
| 5:15 PM                    | 85                 | 126     | 189                   | 201     | 390                          | 126  |           |                        |
| 5:30 PM                    | 79                 | 117     | 169                   | 180     | 349                          | 117  |           |                        |
| 5:45 PM                    | 66                 | 121     | 152                   | 169     | 321                          | 121  |           |                        |
| 6:00 PM                    | 70                 | 115     | 137                   | 176     | 313                          | 115  |           |                        |
| 6:15 PM                    | 56                 | 80      | 95                    | 130     | 225                          | 80   |           |                        |
| 6:30 PM                    | 29                 | 59      | 64                    | 83      | 147                          | 59   |           |                        |
| 6:45 PM                    | 19                 | 21      | 27                    | 48      | 75                           | 21   |           |                        |
| 7:00 PM                    | 0                  | 0       | 0                     | 0       | 0                            | 0  |           |                        |
| 7:15 PM                    | 0                  | 0       | 0                     | 0       | 0                            | 0  |           |                        |
| 7:30 PM                    | 0                  | 0       | 0                     | 0       | 0                            | 0  |           |                        |
| 7:45 PM                    | 0                  | 0       | 0                     | 0       | 0                            | 0  |           |                        |
| 8:00 PM                    | 0                  | 0       | 0                     | 0       | 0                            | 0  |           |                        |



| Top Hours for Figure 4C-1 |          | Start Time | End Time | Major Street | Minor Street |
|---------------------------|----------|------------|----------|--------------|--------------|
| Top Hour                  | 2:15 PM  | 3:15 PM    | 680      | 209          |              |
| 2nd Highest Hour          | 3:45 PM  | 4:45 PM    | 523      | 163          |              |
| 3rd Highest Hour          | 11:15 AM | 12:15 PM   | 474      | 167          |              |
| 4th Highest Hour          | 7:30 AM  | 8:30 AM    | 525      | 135          |              |

| Top Hours for Figure 4C-2 |          | Start Time | End Time | Major Street | Minor Street |
|---------------------------|----------|------------|----------|--------------|--------------|
| Top Hour                  | 1:45 PM  | 2:45 PM    | 989      | 188          |              |
| 2nd Highest Hour          | 2:45 PM  | 3:45 PM    | 564      | 188          |              |
| 3rd Highest Hour          | 3:45 PM  | 4:45 PM    | 523      | 163          |              |
| 4th Highest Hour          | 12:00 AM | 1:00 AM    | 0        | 167          |              |



Are the requirements for Warrant 2 met?:  No

### OMUTCD WARRANT 3, PEAK HOUR

|   |                      |         |
|---|----------------------|---------|
| Number of Lanes for Moving Traffic on Each Approach | Peak Hour Start time | 2:15 PM |
| Major Street: 2 or More Lanes                       | Peak Hour End Time   | 3:15 PM |
| Minor Street: 1 Lane                                |                      |         |

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street?

No

Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?

No

**Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present\***

Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?

Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?

Yes

Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?

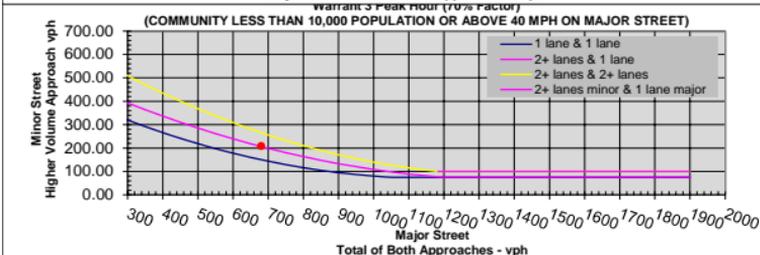
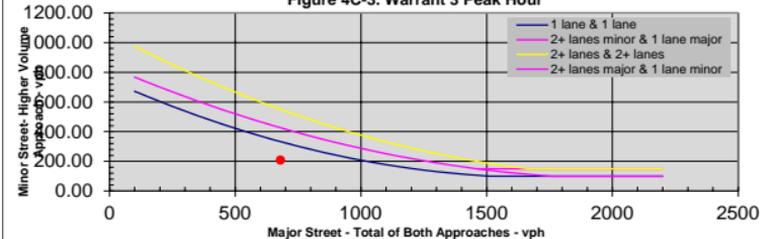
Yes

\*If applicable, attach all supporting calculations and documentation.

Are the requirements for Warrant 3 met?:

No

**Figure 4C-3. Warrant 3 Peak Hour**



| Hour Vehicular Volume      |   |   |  |   |
|----------------------------|---|---|--|---|
| Hour Interval Beginning At | Major Street Combined Vehicles Per Hour (VPH) | Highest Minor Street Approach Vehicles Per Hour (VPH) | Sum of Major Street and Highest Minor Street | Sum of Major Street and Combined Minor Street |
| 6:00 AM                    | 0   | 0   | 0  | 0   |
| 6:15 AM                    | 64  | 11  | 75   | 84  |
| 6:30 AM                    | 168   | 28  | 196  | 212   |
| 6:45 AM                    | 319   | 58  | 377  | 404   |
| 7:00 AM                    | 473   | 93  | 566  | 612   |
| 7:15 AM                    | 520   | 120   | 640  | 691   |
| 7:30 AM                    | 525   | 135   | 660  | 725   |
| 7:45 AM                    | 485   | 154   | 639  | 735   |
| 8:00 AM                    | 411   | 164   | 575  | 676   |
| 8:15 AM                    | 387   | 147   | 534  | 639   |
| 8:30 AM                    | 352   | 143   | 495  | 594   |
| 8:45 AM                    | 328   | 116   | 444  | 513   |
| 9:00 AM                    | 343   | 103   | 446  | 509   |
| 9:15 AM                    | 357   | 113   | 470  | 538   |
| 9:30 AM                    | 371   | 113   | 484  | 563   |
| 9:45 AM                    | 368   | 121   | 489  | 578   |
| 10:00 AM                   | 372   | 114   | 486  | 583   |
| 10:15 AM                   | 375   | 112   | 487  | 585   |
| 10:30 AM                   | 403   | 128   | 531  | 628   |
| 10:45 AM                   | 431   | 144   | 575  | 673   |
| 11:00 AM                   | 441   | 156   | 597  | 706   |
| 11:15 AM                   | 474   | 167   | 641  | 757   |
| 11:30 AM                   | 476   | 155   | 631  | 763   |
| 11:45 AM                   | 477   | 143   | 620  | 758   |
| 12:00 PM                   | 484   | 138   | 622  | 752   |
| 12:15 PM                   | 453   | 137   | 590  | 713   |
| 12:30 PM                   | 444   | 133   | 577  | 684   |
| 12:45 PM                   | 460   | 136   | 596  | 699   |
| 1:00 PM                    | 454   | 144   | 598  | 701   |
| 1:15 PM                    | 460   | 150   | 610  | 723   |
| 1:30 PM                    | 489   | 172   | 661  | 776   |
| 1:45 PM                    | 569   | 196   | 765  | 881   |
| 2:00 PM                    | 637   | 200   | 837  | 953   |
| 2:15 PM                    | 680   | 209   | 889  | 1001  |
| 2:30 PM                    | 663   | 205   | 868  | 988   |
| 2:45 PM                    | 564   | 186   | 750  | 867   |
| 3:00 PM                    | 519   | 185   | 704  | 822   |
| 3:15 PM                    | 495   | 172   | 667  | 800   |
| 3:30 PM                    | 492   | 159   | 651  | 780   |
| 3:45 PM                    | 523   | 163   | 686  | 824   |
| 4:00 PM                    | 506   | 147   | 653  | 797   |
| 4:15 PM                    | 479   | 134   | 613  | 738   |
| 4:30 PM                    | 480   | 130   | 610  | 738   |
| 4:45 PM                    | 439   | 119   | 558  | 676   |
| 5:00 PM                    | 406   | 119   | 525  | 622   |
| 5:15 PM                    | 390   | 126   | 516  | 601   |
| 5:30 PM                    | 349   | 117   | 466  | 545   |
| 5:45 PM                    | 321   | 121   | 442  | 508   |
| 6:00 PM                    | 313   | 115   | 428  | 498   |
| 6:15 PM                    | 225   | 80  | 305  | 361   |
| 6:30 PM                    | 147   | 59  | 206  | 235   |
| 6:45 PM                    | 75  | 21  | 96   | 115   |
| 7:00 PM                    | 0   | 0   | 0  | 0   |
| 7:15 PM                    | 0   | 0   | 0  | 0   |
| 7:30 PM                    | 0   | 0   | 0  | 0   |
| 7:45 PM                    | 0   | 0   | 0  | 0   |
| 8:00 PM                    | 0   | 0   | 0  | 0   |

| Actual Peak Hour Major Traffic Volume | Actual Peak Hour Minor Traffic Volume | Required Peak Hour Minor Traffic Volume for Fig. 4C-3 | Required Peak Hour Minor Traffic Volume for Fig. 4C-4 |
|---------------------------------------|---------------------------------------|---|---|
| 680                                   | 209                                   | 426   | 207   |

## OMUTCD WARRANT 4, PEDESTRIAN VOLUME

| Hour Interval Beginning At                        | Major Street Combined Vehicles Per Hour (VPH) | Total of All Pedestrians Crossing Major Street Pedestrians Per Hour (PPH) |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
|---|---|---|---|---|---|--|---|---|---|---|--|--|---------------------------|-------------|----------|-------------|-------------|----------|----------|-------------|---------|------------------|------------------|---------|---------|-----|------------------|------------------|---------|---------|-----|------------------|------------------|----------|----------|-----|----|
| 6:00 AM   | 0   | 0   | <b>Built-up Isolated Community With Less Than 10,000 Population or Above 35 MPH on Major Street?</b> <span style="float: right; background-color: #D3D3D3; padding: 2px;">No</span>   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 6:15 AM   | 64  | 0   |   | <b>15th Percentile Pedestrian Crossing Speed Less than 3.5 f/s?</b> <span style="float: right; background-color: #D3D3D3; padding: 2px;">No</span><br><i>*If applicable, attach all supporting calculations, documentation, and findings.</i>   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 6:30 AM   | 168   | 2   |   |   | If 15th Percentile Pedestrian Crossing Speed is Less than 3.5 f/s,<br>Reduce Criterion by (up to 50%): <span style="float: right; background-color: #FFFF00; padding: 2px;"></span>   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 6:45 AM   | 319   | 3   |   |   |   | <b>Is the distance to the nearest traffic control signal or STOP sign controlling the major street that pedestrians desire to cross less than 300 feet?</b> <span style="float: right; background-color: #FFFF00; padding: 2px;"></span> |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 7:00 AM   | 473   | 3   |   |   |   |  | If the distance to the nearest traffic control signal or STOP sign controlling the major street that pedestrians desire to cross is less than 300 feet, will the proposed traffic control signal restrict the progressive movement of traffic? If applicable, attach supporting justification. <span style="float: right; background-color: #FFFF00; padding: 2px;"></span> |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 7:15 AM   | 520   | 6   |   |   |   |  |   | <b>Does the intersection meet the 4-Hour Volume?</b> <span style="float: right; background-color: #D3D3D3; padding: 2px;">No</span> |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 7:30 AM   | 525   | 6   |   |   |   |  |   |   | <b>Does the intersection meet the Peak Hour?</b> <span style="float: right; background-color: #D3D3D3; padding: 2px;">No</span> |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 7:45 AM   | 485   | 5   |   |   |   |  |   |   |   | <b>Are the Requirements for Warrant 4 Satisfied?</b> <span style="float: right; background-color: #D3D3D3; padding: 2px;">No</span> |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 8:00 AM   | 411   | 6   |   |   |   |  |   |   |   |   | <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Top Hours for Figure 4C-5</th> <th>Start Time</th> <th>End Time</th> <th>Vehicles</th> <th>Pedestrians</th> </tr> </thead> <tbody> <tr> <td style="background-color: #ADD8E6;">Top Hour</td> <td>2:15 PM</td> <td>3:15 PM</td> <td>680</td> <td>11</td> </tr> <tr> <td>2nd Highest Hour</td> <td>3:45 PM</td> <td>4:45 PM</td> <td>523</td> <td>13</td> </tr> <tr> <td>3rd Highest Hour</td> <td>7:30 AM</td> <td>8:30 AM</td> <td>525</td> <td>6</td> </tr> <tr> <td>4th Highest Hour</td> <td>12:00 PM</td> <td>1:00 PM</td> <td>484</td> <td>7</td> </tr> </tbody> </table> | Top Hours for Figure 4C-5  | Start Time                | End Time    | Vehicles | Pedestrians | Top Hour    | 2:15 PM  | 3:15 PM  | 680         | 11      | 2nd Highest Hour | 3:45 PM          | 4:45 PM | 523     | 13  | 3rd Highest Hour | 7:30 AM          | 8:30 AM | 525     | 6   | 4th Highest Hour | 12:00 PM         | 1:00 PM  | 484      | 7   |    |
| Top Hours for Figure 4C-5                         | Start Time                                    | End Time  |   |   |   |  |   |   |   |   |  | Vehicles   | Pedestrians               |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| Top Hour  | 2:15 PM                                       | 3:15 PM   |   |   |   |  |   |   |   |   |  | 680  | 11                        |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 2nd Highest Hour                                  | 3:45 PM                                       | 4:45 PM   |   |   |   |  |   |   |   |   |  | 523  | 13                        |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 3rd Highest Hour                                  | 7:30 AM                                       | 8:30 AM   |   |   |   |  |   |   |   |   |  | 525  | 6                         |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 4th Highest Hour                                  | 12:00 PM                                      | 1:00 PM   |   |   |   |  |   |   |   |   |  | 484  | 7                         |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 8:15 AM   | 387   | 4   |   |   |   |  |   |   |   |   |  | <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Top Hours for Figure 4C-6</th> <th>Start Time</th> <th>End Time</th> <th>Vehicles</th> <th>Pedestrians</th> </tr> </thead> <tbody> <tr> <td style="background-color: #ADD8E6;">Top Hour</td> <td>2:15 PM</td> <td>3:15 PM</td> <td>680</td> <td>11</td> </tr> <tr> <td>2nd Highest Hour</td> <td>3:45 PM</td> <td>4:45 PM</td> <td>523</td> <td>13</td> </tr> <tr> <td>3rd Highest Hour</td> <td>7:30 AM</td> <td>8:30 AM</td> <td>525</td> <td>6</td> </tr> <tr> <td>4th Highest Hour</td> <td>11:15 AM</td> <td>12:15 PM</td> <td>474</td> <td>13</td> </tr> </tbody> </table> | Top Hours for Figure 4C-6 | Start Time  | End Time | Vehicles    | Pedestrians | Top Hour | 2:15 PM  | 3:15 PM     | 680     | 11               | 2nd Highest Hour | 3:45 PM | 4:45 PM | 523 | 13               | 3rd Highest Hour | 7:30 AM | 8:30 AM | 525 | 6                | 4th Highest Hour | 11:15 AM | 12:15 PM | 474 | 13 |
| Top Hours for Figure 4C-6                         | Start Time                                    | End Time  |   |   |   |  |   |   |   |   |  |  | Vehicles                  | Pedestrians |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| Top Hour  | 2:15 PM                                       | 3:15 PM   | 680   |   |   |  |   |   |   |   |  |  | 11                        |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 2nd Highest Hour                                  | 3:45 PM                                       | 4:45 PM   | 523   | 13  |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 3rd Highest Hour                                  | 7:30 AM                                       | 8:30 AM   | 525   | 6   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 4th Highest Hour                                  | 11:15 AM                                      | 12:15 PM  | 474   | 13  |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 8:30 AM   | 352   | 3   | <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th colspan="4" style="text-align: center;">Peak Hour Used for Graphs 4C-7 &amp; 4C-8</th> </tr> <tr> <th colspan="4" style="text-align: center; background-color: #ADD8E6;">Top Hour</th> </tr> <tr> <th>Start Time</th> <th>End Time</th> <th>Vehicles</th> <th>Pedestrians</th> </tr> </thead> <tbody> <tr> <td style="background-color: #ADD8E6;">2:15 PM</td> <td style="background-color: #ADD8E6;">3:15 PM</td> <td style="background-color: #ADD8E6;">680</td> <td style="background-color: #ADD8E6;">11</td> </tr> </tbody> </table> | Peak Hour Used for Graphs 4C-7 & 4C-8   |   |  |   |   |   |   |  |  | Top Hour                  |             |          |             | Start Time  | End Time | Vehicles | Pedestrians | 2:15 PM | 3:15 PM          | 680              | 11      |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| Peak Hour Used for Graphs 4C-7 & 4C-8             |   |   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| Top Hour  |   |   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| Start Time  | End Time                                      | Vehicles  |   | Pedestrians   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 2:15 PM   | 3:15 PM                                       | 680   |   | 11  |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 8:45 AM   | 328   | 6   |   | <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Number of Hours That Met the 4-Hour Criteria 4C-5</th> <th style="width: 50px;"></th> </tr> </thead> <tbody> <tr> <td style="background-color: #D3D3D3; text-align: center;">0</td> <td></td> </tr> </tbody> </table> | Number of Hours That Met the 4-Hour Criteria 4C-5   |  | 0   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| Number of Hours That Met the 4-Hour Criteria 4C-5 |   |   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 0   |   |   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 9:00 AM   | 343   | 10  |   |   | <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Number of Hours That Met the 4-Hour Criteria 4C-6</th> <th style="width: 50px;"></th> </tr> </thead> <tbody> <tr> <td style="background-color: #D3D3D3; text-align: center;">0</td> <td></td> </tr> </tbody> </table> | Number of Hours That Met the 4-Hour Criteria 4C-6  |   | 0   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| Number of Hours That Met the 4-Hour Criteria 4C-6 |   |   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 0   |   |   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 9:15 AM   | 357   | 12  |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 9:30 AM   | 371   | 14  |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 9:45 AM   | 368   | 18  |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 10:00 AM  | 372   | 19  |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 10:15 AM  | 375   | 26  |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 10:30 AM  | 403   | 28  |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 10:45 AM  | 431   | 23  |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 11:00 AM  | 441   | 23  |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 11:15 AM  | 474   | 13  |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 11:30 AM  | 476   | 8   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 11:45 AM  | 477   | 10  |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 12:00 PM  | 484   | 7   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 12:15 PM  | 453   | 7   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 12:30 PM  | 444   | 9   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 12:45 PM  | 460   | 6   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 1:00 PM   | 454   | 5   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 1:15 PM   | 460   | 5   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 1:30 PM   | 489   | 7   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 1:45 PM   | 569   | 6   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 2:00 PM   | 637   | 6   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 2:15 PM   | 680   | 11  |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 2:30 PM   | 663   | 9   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 2:45 PM   | 564   | 12  |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 3:00 PM   | 519   | 13  |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 3:15 PM   | 495   | 11  |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 3:30 PM   | 492   | 10  |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 3:45 PM   | 523   | 13  |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 4:00 PM   | 506   | 11  |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 4:15 PM   | 479   | 11  |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 4:30 PM   | 480   | 11  |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 4:45 PM   | 439   | 5   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 5:00 PM   | 406   | 6   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 5:15 PM   | 390   | 3   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 5:30 PM   | 349   | 2   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 5:45 PM   | 321   | 6   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 6:00 PM   | 313   | 5   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 6:15 PM   | 225   | 5   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 6:30 PM   | 147   | 5   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 6:45 PM   | 75  | 1   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 7:00 PM   | 0   | 0   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 7:15 PM   | 0   | 0   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 7:30 PM   | 0   | 0   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 7:45 PM   | 0   | 0   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |
| 8:00 PM   | 0   | 0   |   |   |   |  |   |   |   |   |  |  |                           |             |          |             |             |          |          |             |         |                  |                  |         |         |     |                  |                  |         |         |     |                  |                  |          |          |     |    |

Figure 4C-5. Warrant 4, Pedestrians Four-Hour Volume

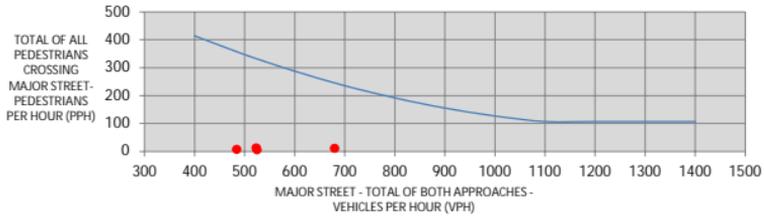
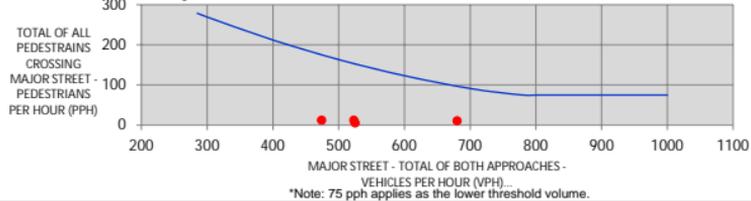


Figure 4C-6. Warrant 4, Pedestrian Four Hour Volume (70% Factor)



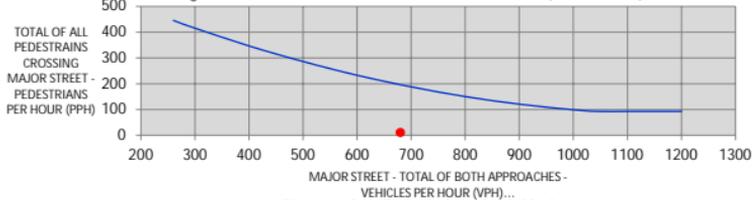
\*Note: 75 pph applies as the lower threshold volume.

Figure 4C-7. Warrant 4, Pedestrian Peak Hour



\*Note: 133 pph applies as the lower threshold volume.

Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



\*Note: 93 pph applies as the lower threshold volume.