##  <br> ＊［）＊ <br> $\therefore$ ：

## 

 \＄\％光糔（ ＊緊正：TRAFFIC SIGNAL WARRANT SUMMARY

|  | Lincoln | Engineer: Date: | John P Diediker |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | January 13, 2020 |  |
|  |  |  |  |  |
| Major Street: | 9th St | Lanes: | Major Approach Speed: | 25 |
| Minor Street: | Q St | Lanes: 1 | Minor Approach Speed: | 25 |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and
 inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 80\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\underset{\substack{\infty \\ \underset{N}{i} \\ \hline}}{ }$ | $\begin{aligned} & \Sigma_{0}^{2} \\ & 0 \\ & + \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{8} \\ & 0 \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{n}{j} \\ & M \end{aligned}$ | $\begin{aligned} & \underset{\sim}{\Sigma} \\ & \underset{N}{N} \end{aligned}$ | S N N |  |
| Major | 2,442 | 2,023 | 1,971 | 1,946 | 1,887 | 1,460 | 1,371 | 1,271 |
| Minor | 308 | 443 | 320 | 518 | 406 | 429 | 404 | 374 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{V}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| 100\% Satisfied: | $\boxed{V}$ Yes | $\square$ No |
| 80\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\sum$ $\substack{\infty \\ N}$ | $\begin{aligned} & \sum_{0}^{5} \\ & 0 \\ & \hline \end{aligned}$ | $\sum$ 4 0 0 0 | $\sum$ 0 0 0 10 | n n ¢ ¢ | E ¢ N | E N N |  |
| Major | 2,442 | 2,023 | 1,971 | 1,946 | 1,887 | 1,460 | 1,371 | 1,271 |
| Minor | 308 | 443 | 320 | 518 | 406 | 429 | 404 | 374 |

## Existing Volumes






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| 5-6 PM | 2538 | 32 |
| $4-5 \mathrm{PM}$ | 2594 | 26 |
| $7-8 \mathrm{AM}$ | 1342 | 16 |
| $7-8 \mathrm{AM}$ | 2336 | 15 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $5-6$ PM | 2538 | 32 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

|  | Lincoln | Engineer: Date: | John P Diediker |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | January 10, 2020 |  |
|  |  |  |  |  |
| Major Street: | 9th St | Lanes: | Major Approach Speed: | 25 |
| Minor Street: | P St | Lanes: $\mathbf{2}$ | Minor Approach Speed: | 25 |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Yes — No
Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied$\checkmark$ No (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| $70 \%$ Satisfied: | $\boxed{ }$ Yes | $\square$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $$ |  | $\begin{aligned} & \Sigma \\ & \underset{\sim}{n} \\ & \dot{N} \end{aligned}$ | $\sum$ 0 $\pm$ | $\sum$ 4 0 $\infty$ | n ¢ N | n N - | $\sum$ ¢ N N |
| Major | 2,739 | 2,381 | 2,349 | 2,290 | 2,110 | 1,679 | 1,582 | 1,428 |
| Minor | 318 | 146 | 344 | 246 | 158 | 207 | 237 | 220 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{V}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| 100\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| 80\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| $70 \%$ Satisfied: | $\boxed{ }$ Yes | $\square$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\sum$ 0 0 0 | $\begin{aligned} & \underset{<}{\mathbb{4}} \\ & \underset{N}{\infty} \end{aligned}$ | $\sum$ 0 0 0 10 | n n ¢ | $\sum$ 4 0 0 0 | E ¢ N | E N N |  |
| Major | 2,739 | 2,381 | 2,349 | 2,290 | 2,110 | 1,679 | 1,582 | 1,428 |
| Minor | 318 | 146 | 344 | 246 | 158 | 207 | 237 | 220 |

## Existing Volumes






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $4-5 \mathrm{PM}$ | 37 | 5 |
| $12-1 \mathrm{PM}$ | 34 |  |
| $7-8 \mathrm{AM}$ | 33 | 14 |
| $7-8 \mathrm{AM}$ | 10 | 9 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $4-5$ PM | 37 | 5 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

|  | Lincoln | Engineer: Date: | John P Diediker |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | January 13, 2020 |  |
|  |  |  |  |  |
| Major Street: | S 9th St | Lanes: 4 | Major Approach Speed: | 25 |
| Minor Street: | N St | Lanes: $\mathbf{2}$ | Minor Approach Speed: | 25 |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Yes _ No
Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfiedYes $\checkmark$ No (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $$ | $\underset{\substack{\mathbb{Z} \\ \underset{N}{\infty} \\ \hline}}{ }$ | $\begin{aligned} & \sum_{i} \\ & \hline \\ & i \end{aligned}$ | n n M | $\sum$ 4 0 0 $\infty$ |  | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{2} \end{aligned}$ | E N N N |
| Major | 2,526 | 2,399 | 2,226 | 2,172 | 1,745 | 1,598 | 1,544 | 1,427 |
| Minor | 371 | 276 | 371 | 264 | 299 | 258 | 254 | 225 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\sum$ 0 0 0 | $\begin{aligned} & \underset{<}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\sum$ 0 0 0 0 | n ¢ N | $\sum$ 4 0 0 |  | n N N | E N N T |
| Major | 2,526 | 2,399 | 2,226 | 2,172 | 1,745 | 1,598 | 1,544 | 1,427 |
| Minor | 371 | 276 | 371 | 264 | 299 | 258 | 254 | 225 |

## Existing Volumes






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
|  | $\|c\|$ <br>  <br>  <br> Street | Pedumes <br> Total |
| $12-1 \mathrm{PM}$ | 1598 | 46 |
| $4-5 \mathrm{PM}$ | 2526 | 39 |
| $11-12 \mathrm{PM}$ | 1427 | 39 |
| $11-12 \mathrm{PM}$ | 1544 | 34 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 1598 | 46 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

|  | Lincoln | Engineer: Date: | John P Diediker |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | January 14, 2020 |  |
|  |  |  |  |  |
| Major Street: | S 9th St | Lanes: 4 | Major Approach Speed: | 25 |
| Minor Street: | M St | Lanes: $\mathbf{2}$ | Minor Approach Speed: | 25 |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied(should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { a }}$ | $\mathbf{8 0 \% ^ { \mathbf { b } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \sum_{0}^{5} \\ & \substack{0 \\ \hline} \end{aligned}$ | $\begin{aligned} & \sum_{0} \\ & 0 \\ & i \end{aligned}$ | $\begin{aligned} & \underset{\ll}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \vdots \\ & \vdots \end{aligned}$ | $\begin{aligned} & \sum< \\ & 0 \\ & \infty \\ & \infty \end{aligned}$ | $\begin{aligned} & \sum_{n} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \sum_{n} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ |
| Major | 2,594 | 2,538 | 2,336 | 2,285 | 1,842 | 1,692 | 1,675 | 1,342 |
| Minor | 335 | 325 | 137 | 198 | 96 | 150 | 194 | 188 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{V}$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\square$ No |
| 80\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| $70 \%$ Satisfied: | $\boxed{ }$ Yes | $\square$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{\text {c }}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma \\ & \mathbf{n} \\ & \text { O } \end{aligned}$ | $\begin{aligned} & \sum_{n} \\ & \text { io } \\ & \text { in } \end{aligned}$ | $\begin{aligned} & \sum_{<}^{\infty} \\ & \stackrel{i}{\prime} \end{aligned}$ | $\begin{aligned} & \sum_{n} \\ & \text { N } \end{aligned}$ | $\begin{aligned} & \sum \\ & \underset{\alpha}{\circ} \\ & \dot{\infty} \end{aligned}$ | $\begin{aligned} & \Sigma \underset{0}{N} \\ & \underset{\sim}{n} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{\sim}{N} \\ & \underset{N}{\prime} \end{aligned}$ | E N N İ |
| Major | 2,594 | 2,538 | 2,336 | 2,285 | 1,842 | 1,692 | 1,675 | 1,342 |
| Minor | 335 | 325 | 137 | 198 | 96 | 150 | 194 | 188 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| 5-6 PM | 2538 | 32 |
| $4-5 \mathrm{PM}$ | 2594 | 26 |
| $7-8 \mathrm{AM}$ | 1342 | 16 |
| $7-8 \mathrm{AM}$ | 2336 | 15 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $5-6$ PM | 2538 | 32 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and
 inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 80\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma \\ & \underset{0}{\circ} \\ & \dot{0} \end{aligned}$ | $$ | $\begin{aligned} & \underset{4}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{4}{6} \\ & \text { ob } \end{aligned}$ | n ¢ ¢ | $\begin{aligned} & \underset{N}{\Sigma} \\ & \underset{N}{N} \end{aligned}$ | n N - |  |
| Major | 2,795 | 2,739 | 1,934 | 1,804 | 1,758 | 1,384 | 1,353 | 1,347 |
| Minor | 1,040 | 868 | 505 | 472 | 689 | 655 | 637 | 513 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{V}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| 100\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| 80\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| $70 \%$ Satisfied: | $\boxed{ }$ Yes | $\square$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\sum$ 0 0 0 10 | $$ | $\sum$ $\substack{\text { a }}$ $N$ | $\sum$ 4 0 0 | n n ¢ ¢ | E ¢ N | E N N |  |
| Major | 2,795 | 2,739 | 1,934 | 1,804 | 1,758 | 1,384 | 1,353 | 1,347 |
| Minor | 1,040 | 868 | 505 | 472 | 689 | 655 | 637 | 513 |

## Existing Volumes






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1 \mathrm{PM}$ | 119 | 46 |
| $5-6 \mathrm{PM}$ | 114 | 42 |
| $1-2 \mathrm{PM}$ | 89 | 33 |
| $1-2 \mathrm{PM}$ | 76 | 29 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 119 | 46 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

| City <br> County: <br> District | Lincoln | Engineer: Date: | John P Diediker |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | January 13, 2020 |  |
|  |  |  |  |  |
| Major Street: | 10th St | Lanes: $\mathbf{4}$ | Major Approach Speed: | 25 |
| Minor Street: | P St | Lanes: $\mathbf{2}$ | Minor Approach Speed: | 25 |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and
 inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| :---: | :---: | :---: |
| 80\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & \Sigma \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\sum$ $\substack{\text { ¢ }}$ $\sim$ | $\sum$ 0 $\vdots$ ¢ | $\sum$ $<$ 0 0 0 | $\begin{aligned} & \underset{N}{\Sigma} \\ & \underset{\sim}{N} \end{aligned}$ | n N - | S N N T |
| Major | 2,212 | 2,212 | 1,876 | 1,780 | 1,681 | 1,444 | 1,422 | 1,309 |
| Minor | 724 | 711 | 550 | 587 | 615 | 524 | 650 | 463 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{V}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| 100\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| 80\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| $70 \%$ Satisfied: | $\boxed{ }$ Yes | $\square$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\sum$ 0 0 0 | $\begin{aligned} & \sum_{0}^{2} \\ & 0 \\ & \text { in } \end{aligned}$ | $\sum$ $\substack{\infty \\ N}$ | n ¢ ¢ | $\sum$ 4 0 0 | S ¢ N | N $\sim$ $\sim$ $\sim$ | S N N T |
| Major | 2,212 | 2,212 | 1,876 | 1,780 | 1,681 | 1,444 | 1,422 | 1,309 |
| Minor | 724 | 711 | 550 | 587 | 615 | 524 | 650 | 463 |

## Existing Volumes






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $5-6 \mathrm{PM}$ | 187 | 57 |
| $11-12 \mathrm{AM}$ | 153 | 47 |
| $12-1 \mathrm{PM}$ | 153 | 38 |
| $12-1 \mathrm{PM}$ | 134 | 41 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $5-6$ PM | 187 | 57 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

|  | Lincoln | Engineer: Date: | John P Diediker |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | January 16, 2020 |  |
|  |  |  |  |  |
| Major Street: | 10th St | Lanes: 4 | Major Approach Speed: | 25 |
| Minor Street: | N St | Lanes: $\mathbf{2}$ | Minor Approach Speed: | 25 |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and
 inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\underset{\substack{\infty \\ \underset{N}{\infty} \\ \hline}}{ }$ | $\begin{aligned} & \Sigma \\ & \underset{\sim}{n} \\ & \dot{\sim} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{\sim}{n} \\ & \dot{N} \end{aligned}$ | $\sum$ 4 0 $\infty$ | n ¢ ¢ | n N N | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{\sim}{N} \end{aligned}$ | n N N |
| Major | 2,320 | 2,238 | 2,088 | 2,019 | 1,948 | 1,507 | 1,471 | 1,383 |
| Minor | 172 | 579 | 509 | 228 | 368 | 295 | 268 | 258 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{<}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ |  | $\sum$ 0 0 0 0 | $\sum$ 4 0 0 0 | n n ¢ | E ¢ N | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{T} \end{aligned}$ | E N N |
| Major | 2,320 | 2,238 | 2,088 | 2,019 | 1,948 | 1,507 | 1,471 | 1,383 |
| Minor | 172 | 579 | 509 | 228 | 368 | 295 | 268 | 258 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $7-8 \mathrm{AM}$ | 2320 | 113 |
| $4-5 \mathrm{PM}$ | 2238 | 98 |
| 5-6 PM | 2019 | 79 |
| 5-6 PM | 2088 | 71 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $7-8$ AM | 2320 | 113 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

|  | Lincoln | Engineer: Date: | John P Diediker |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | January 15, 2020 |  |
|  |  |  |  |  |
| Major Street: | 10th St | Lanes: 4 | Major Approach Speed: | 25 |
| Minor Street: | M St | Lanes: $\mathbf{2}$ | Minor Approach Speed: | 25 |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and
 inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{<}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $$ | $\begin{aligned} & \Sigma \\ & \underset{0}{\circ} \\ & \dot{0} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{4}{6} \\ & \text { ob } \end{aligned}$ | n ¢ ¢ | $\begin{aligned} & \underset{\sim}{\Sigma} \\ & \underset{\sim}{N} \end{aligned}$ | n N N | S N N T |
| Major | 2,407 | 2,242 | 2,160 | 2,072 | 1,849 | 1,485 | 1,438 | 1,433 |
| Minor | 338 | 291 | 269 | 273 | 238 | 274 | 207 | 253 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \sum_{k}^{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \sum_{0}^{2} \\ & 0 \\ & 8 \end{aligned}$ | $\sum$ 0 0 0 0 | $\sum$ 4 0 0 | $\sum$ 0 $\pm$ N | n ¢ N | n N N | E $\sim$ $\sim$ $\sim$ $\sim$ |
| Major | 2,407 | 2,242 | 2,160 | 2,072 | 1,849 | 1,485 | 1,438 | 1,433 |
| Minor | 338 | 291 | 269 | 273 | 238 | 274 | 207 | 253 |

## Existing Volumes






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| Four Highest Hours | Volumes |  |
| :---: | :---: | :---: |
|  | Major Street | Pedestrian Total |
| 11-12 PM | 1433 | 20 |
| 1-2 PM | 1438 | 18 |
| 3-4 PM | 2242 | 17 |
| 3-4 PM | 1849 | 14 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $11-12$ PM | 1433 | 20 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

| City: |  |
| ---: | :--- |
| County: |  |
| District: |  |
|  |  |
| Major Street: |  |
| Minor Street: |  |


| Engineer: $\left.\begin{array}{rl}\text { John P Diediker } \\ \text { Date: } \\ \end{array}\right)$ January 9, 2020 |
| ---: |


| Lanes: $\quad \mathbf{4}$ |
| :--- |
| Lanes: $\mathbf{2}$ |

Major Approach Speed: $\qquad$
MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population < 10,000 ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions A and B after adequate trial of other remedial measures
${ }^{\text {c }}$ May be used when the maior-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \sum_{0} \\ & \text { io } \\ & \text { in } \end{aligned}$ | $\begin{aligned} & \Sigma \underset{N}{\Sigma} \\ & \underset{N}{N} \end{aligned}$ | $$ | $\begin{aligned} & \sum_{0} \\ & \underset{\text { N }}{ } \end{aligned}$ | $\begin{aligned} & \sum_{0} \\ & \end{aligned}$ | $\begin{aligned} & \sum \\ & \underset{\infty}{5} \\ & \dot{\infty} \end{aligned}$ |  | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{~ N}{\prime} \end{aligned}$ |
| Major | 982 | 830 | 828 | 731 | 711 | 670 | 650 | 646 |
| Minor | 58 | 22 | 60 | 25 | 19 | 21 | 32 | 19 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | E 0 0 ¢ | $\begin{aligned} & \sum_{\mathbf{N}}^{+} \\ & \underset{N}{N} \end{aligned}$ | $\sum$ 0 0 0 8 | E N ¢ | E N N | $\sum$ $\substack{\text { a }}$ 0 0 | $\sum$ $\substack{\infty \\ N}$ |  |
| Major | 982 | 830 | 828 | 731 | 711 | 670 | 650 | 646 |
| Minor | 58 | 22 | 60 | 25 | 19 | 21 | 32 | 19 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1 \mathrm{PM}$ | 830 | 121 |
| $4-5 \mathrm{PM}$ | 828 | 102 |
| $3-4 \mathrm{PM}$ | 711 | 94 |
| $3-4 \mathrm{PM}$ | 731 | 88 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 830 | 121 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

| City: |  |
| ---: | :--- |
| County: |  |
| District: |  |
|  |  |
| Major Street: |  |
| Minor Street: |  |


| Engineer: $\left.\begin{array}{rl}\text { John P Diediker } \\ \text { Date: } \\ \end{array}\right)$ January 9, 2020 |
| ---: |


| Lanes: | $\mathbf{2}$ |
| :--- | :--- |
| Lanes: |  |

Major Approach Speed: $\qquad$
MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population < 10,000 ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions A and B after adequate trial of other remedial measures
${ }^{\text {c }}$ May be used when the maior-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \Sigma_{0} \\ & 0 \\ & i \end{aligned}$ | $\begin{aligned} & \sum \\ & \underset{\alpha}{\infty} \\ & \dot{\infty} \end{aligned}$ |  | $\underset{\substack{\sum \\ \multirow{2}{*}{}}}{ }$ | $\begin{aligned} & \sum_{0} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \underset{N}{\Sigma} \\ & \underset{\sim}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \mathbf{N} \\ & \underset{\sim}{N} \end{aligned}$ | $\begin{aligned} & \sum_{n} \\ & \vdots \\ & \text { J } \end{aligned}$ |
| Major | 561 | 558 | 541 | 539 | 537 | 527 | 452 | 433 |
| Minor | 235 | 97 | 192 | 101 | 176 | 171 | 174 | 110 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \sum_{0} \\ & 0 \\ & i \end{aligned}$ | $\begin{aligned} & \underset{6}{\Sigma} \\ & \underset{\infty}{1} \\ & \infty \end{aligned}$ | $\sum$ 0 0 4 | $\sum$ $\underset{\sim}{\infty}$ $\sim$ | $\begin{aligned} & \sum_{0} \\ & \underset{\sim}{N} \\ & \underset{V}{\top} \end{aligned}$ | S N N | E N N | E N N |
| Major | 561 | 558 | 541 | 539 | 537 | 527 | 452 | 433 |
| Minor | 235 | 97 | 192 | 101 | 176 | 171 | 174 | 110 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |  |
| :---: | :---: | :---: |
| Hour Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $5-6$ PM | 561 | 133 |
| $12-1$ PM | 527 | 129 |
| $1-2 ~ P M$ | 537 | 126 |
| $1-2 ~ P M$ | 452 | 113 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $5-6$ PM | 561 | 133 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

|  | Lincoln | Engineer: Date: | John P Diediker |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | January 9, 2020 |  |
|  |  |  |  |  |
| Major Street: | 0 St | Lanes: $\mathbf{2}$ | Major Approach Speed: | 25 |
| Minor Street: | 11th St | Lanes: 2 | Minor Approach Speed: | 25 |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


YesNo

Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfiedYes $\checkmark$ No (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & \Sigma \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \Sigma_{0} \\ & \underset{N}{7} \end{aligned}$ |  | S N N | $\sum$ $\substack{\text { c } \\ \text { N }}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | $\sum$ 4 0 0 0 |
| Major | 1,579 | 1,442 | 1,435 | 1,364 | 1,281 | 1,233 | 1,198 | 1,148 |
| Minor | 186 | 213 | 179 | 168 | 176 | 125 | 140 | 107 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | ¢ | $\begin{aligned} & \sum_{0}^{2} \\ & 0 \\ & \text { in } \end{aligned}$ | n n ¢ m |  | E N N | $\sum$ $\substack{\infty \\ \sim}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{T} \end{aligned}$ | $\sum$ 4 0 0 0 |
| Major | 1,579 | 1,442 | 1,435 | 1,364 | 1,281 | 1,233 | 1,198 | 1,148 |
| Minor | 186 | 213 | 179 | 168 | 176 | 125 | 140 | 107 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level <br> Hours Highest <br>   <br>  <br>  <br> Major <br> Street | Pedestrian <br> Total |  |
| :---: | :---: | :---: |
|  | 11964 | 206 |
| $3-4 \mathrm{PM}$ | 1281 | 172 |
| $3-4 \mathrm{PM}$ | 1435 | 136 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 1364 | 206 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

|  | Lincoln | Engineer: Date: | John P Diediker |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | January 9, 2020 |  |
|  |  |  |  |  |
| Major Street: | N St | Lanes: $\mathbf{2}$ | Major Approach Speed: | 25 |
| Minor Street: | 11th St | Lanes: 2 | Minor Approach Speed: | 25 |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \Psi \\ & \text { N } \end{aligned}$ | E N N N | S N N | $\begin{aligned} & \sum_{0}^{N} \\ & \frac{N}{\Gamma} \end{aligned}$ | $\begin{aligned} & \sum \\ & k \\ & \infty \\ & \infty \\ & \infty \end{aligned}$ | $\underset{\substack{\sum \\ \multirow{4}{\infty}{\sim}\\ \sim}}{ }$ |
| Major | 744 | 597 | 444 | 366 | 280 | 261 | 227 | 164 |
| Minor | 219 | 194 | 184 | 183 | 199 | 191 | 166 | 127 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \sum_{0}^{2} \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{n} \\ & 0 \\ & i \end{aligned}$ | E N J N | $\underset{\text { E }}{\text { N }}$ | N N N | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | $\sum$ 4 0 0 0 | $\sum$ $\substack{\text { c } \\ \text { N }}$ |
| Major | 744 | 597 | 444 | 366 | 280 | 261 | 227 | 164 |
| Minor | 219 | 194 | 184 | 183 | 199 | 191 | 166 | 127 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| Four Highest Hours | Volumes |  |
| :---: | :---: | :---: |
|  | Major <br> Street | Pedestrian Total |
| 4-5 PM | 744 | 159 |
| 1-2 PM | 280 | 142 |
| 12-1 PM | 261 | 140 |
| 12-1 PM | 366 | 127 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $4-5$ PM | 744 | 159 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

|  | Lincoln | Engineer: Date: | John P Diediker |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | January 9, 2020 |  |
|  |  |  |  |  |
| Major Street: | S 11th St | Lanes: $\mathbf{2}$ | Major Approach Speed: | 25 |
| Minor Street: | M St | Lanes: 2 | Minor Approach Speed: | 25 |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\underset{\substack{\underset{\sim}{\infty} \\ \underset{N}{2}}}{ }$ | $\begin{aligned} & \underset{1}{\Sigma} \\ & 0 \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \begin{array}{l} n \\ 0 \\ \text { O } \end{array} \end{aligned}$ | $\underset{\text { E }}{\text { E }}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \underset{0}{\Sigma} \\ & \underset{\sim}{N} \end{aligned}$ | E N ¢ N |
| Major | 512 | 426 | 303 | 292 | 269 | 239 | 238 | 226 |
| Minor | 174 | 202 | 390 | 255 | 394 | 281 | 226 | 299 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{ }$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{\square}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{\text {c }}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street |  | $\begin{aligned} & \sum \\ & \underset{\infty}{5} \\ & \dot{\infty} \end{aligned}$ |  | $\begin{aligned} & \Sigma_{0} \\ & \dot{N} \end{aligned}$ | $\begin{aligned} & \sum_{0} \\ & \text { ei } \\ & i \end{aligned}$ | $\begin{aligned} & \underset{0}{\mathbf{N}} \\ & \underset{\sim}{n} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{\Sigma}{N} \end{aligned}$ |  |
| Major | 512 | 426 | 303 | 292 | 269 | 239 | 238 | 226 |
| Minor | 174 | 202 | 390 | 255 | 394 | 281 | 226 | 299 |

Existing Volumes





## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 292 | 101 |
| $11-12 \mathrm{PM}$ | 238 | 90 |
| $4-5 \mathrm{PM}$ | 303 | 88 |
| $4-5 \mathrm{PM}$ | 239 | 86 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 292 | 101 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \Sigma \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \underset{\gtrless}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\sum$ in N | $\begin{aligned} & \Sigma \\ & \underset{4}{8} \\ & \infty \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{0}{N} \\ & \underset{N}{N} \end{aligned}$ | S N N | E N N |
| Major | 1,139 | 1,102 | 1,021 | 957 | 804 | 654 | 651 | 619 |
| Minor | 376 | 341 | 106 | 195 | 113 | 200 | 212 | 220 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | 5 0 0 0 | $\begin{aligned} & \sum \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\sum$ $\substack{\infty \\ \sim \\ N}$ | E N N | $\begin{aligned} & \sum \\ & \underset{\&}{\infty} \\ & \infty \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \mathbf{N} \\ & \mathbf{N} \end{aligned}$ | $\underset{\underset{N}{\Sigma}}{\underset{N}{\Sigma}}$ | E N N |
| Major | 1,139 | 1,102 | 1,021 | 957 | 804 | 654 | 651 | 619 |
| Minor | 376 | 341 | 106 | 195 | 113 | 200 | 212 | 220 |

Existing Volumes





## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| Four Highest Hours | Volumes |  |
| :---: | :---: | :---: |
|  | Major <br> Street | Pedestrian Total |
| 4-5 PM | 1139 | 55 |
| 1-2 PM | 619 | 50 |
| 5-6 PM | 1102 | 43 |
| 5-6 PM | 957 | 40 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes |
| ---: | :--- |
| Satisfied: | $\square$ No |
| Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $4-5$ PM | 1139 | 55 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

| City: | Lincoln |
| ---: | :--- |
| County |  |
| District: |  |
|  |  |
| Major Street: |  |
| Minor Street: |  |


| Engineer: | John P Diediker |
| ---: | :--- |
| Date: |  |


| Lanes: | $\mathbf{4}$ |
| :--- | :--- |
| Lanes: |  |

Major Approach Speed $\qquad$
MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population < 10,000 ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\square$ No |
| $70 \%$ Satisfied: | $\boxed{ }$ Yes | $\square$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions A and B after adequate trial of other remedial measures
${ }^{\text {c }}$ May be used when the maior-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\underset{\substack{\Sigma \\ \underset{\sim}{\infty}}}{ }$ | $\begin{aligned} & \Sigma \\ & \stackrel{\Sigma}{<} \\ & \dot{\infty} \end{aligned}$ | $$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \mathbf{0} \\ & i \end{aligned}$ |  | $\begin{aligned} & \sum_{0} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \sum_{0} \\ & \underset{N}{N} \\ & \underset{\Gamma}{2} \end{aligned}$ | $\begin{aligned} & \Sigma \mathbf{\Sigma} \\ & \mathbf{N} \end{aligned}$ |
| Major | 1,617 | 1,240 | 1,185 | 1,091 | 1,001 | 713 | 623 | 617 |
| Minor | 159 | 179 | 396 | 395 | 274 | 276 | 213 | 301 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{\sim}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{4}{4} \\ & 0 \\ & \infty \end{aligned}$ | $\sum$ 0 0 8 | $\sum$ 0 0 0 0 | n n ¢ | $\sum$ $\underset{N}{\text { N }}$ N | $\begin{aligned} & \underset{0}{N} \\ & \underset{\sim}{N} \end{aligned}$ | E N N |
| Major | 1,617 | 1,240 | 1,185 | 1,091 | 1,001 | 713 | 623 | 617 |
| Minor | 159 | 179 | 396 | 395 | 274 | 276 | 213 | 301 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
|  | $\|c\|$ <br> Molumes <br> Street | Pedestrian <br> Total |
| $12-1 \mathrm{PM}$ | 713 | 83 |
| $1-2 \mathrm{PM}$ | 617 | 68 |
| $11-12 \mathrm{PM}$ | 623 | 65 |
| $11-12 \mathrm{PM}$ | 1185 | 62 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 713 | 83 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \boldsymbol{\Sigma} \\ & \mathbf{0} \\ & 0 \\ & i \end{aligned}$ | $\sum$ 0 0 0 |  | n N N | $\begin{aligned} & \sum_{i}^{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \underset{N}{\prime} \end{aligned}$ | $\begin{aligned} & \underset{\underset{K}{4}}{N} \\ & \underset{\sim}{\top} \end{aligned}$ | $\sum$ $\substack{\text { a }}$ 0 0 |
| Major | 866 | 737 | 660 | 592 | 581 | 579 | 565 | 550 |
| Minor | 181 | 151 | 163 | 145 | 174 | 108 | 153 | 214 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{ }$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{\square}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

\begin{tabular}{|c|c|c|c|c|c|c|c|c|}
\hline \multicolumn{9}{|c|}{Eight Highest Hours} <br>
\hline Street \& $$
\begin{aligned}
& \Sigma \\
& \mathbf{0} \\
& \mathbf{0} \\
& \dot{i}
\end{aligned}
$$ \& $$
\begin{aligned}
& \Sigma \\
& \underset{0}{5} \\
& \underset{\sim}{n}
\end{aligned}
$$ \&  \& E

N \& $\sum$
$\substack{\infty \\ \sim \\ N}$ \& E
N
J

N \& $$
\begin{aligned}
& \sum \\
& \underset{\sim}{K} \\
& \underset{N}{N}
\end{aligned}
$$ \& $\sum$

4
0
0
0 <br>
\hline Major \& 866 \& 737 \& 660 \& 592 \& 581 \& 579 \& 565 \& 550 <br>
\hline Minor \& 181 \& 151 \& 163 \& 145 \& 174 \& 108 \& 153 \& 214 <br>
\hline
\end{tabular}






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 307 | 139 |
| 1-2 PM | 240 | 86 |
| $3-4$ PM | 229 | 113 |
| $3-4$ PM | 162 | 60 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 307 | 139 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma \\ & \mathbf{n} \\ & 0 \\ & i \end{aligned}$ | $\sum$ 0 0 0 | $\underset{\text { E }}{\text { E }}$ | $\begin{aligned} & \underset{\varangle}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{0}{1} \\ & \text { N } \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{6}{0} \\ & \infty \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \underset{\sim}{2} \end{aligned}$ |  |
| Major | 699 | 663 | 579 | 546 | 545 | 539 | 529 | 506 |
| Minor | 186 | 153 | 143 | 104 | 127 | 104 | 105 | 105 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{ }$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{\square}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{\text {c }}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma \\ & \begin{array}{l} n \\ 0 \\ i \end{array} \end{aligned}$ |  | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \end{aligned}$ | $\underset{\substack{\infty \\ \multirow{1}{N}{}}}{ }$ | $\begin{aligned} & \sum \\ & \vdots \\ & \vdots \end{aligned}$ | $\begin{aligned} & \underset{<}{\Sigma} \\ & \dot{\infty} \end{aligned}$ | $\begin{aligned} & \underset{0}{\boldsymbol{N}} \\ & \underset{\sim}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{\Sigma} \\ & \underset{~}{\prime} \end{aligned}$ |
| Major | 699 | 663 | 579 | 546 | 545 | 539 | 529 | 506 |
| Minor | 186 | 153 | 143 | 104 | 127 | 104 | 105 | 105 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
|  | $\|c\|$ <br> Molumes <br> Street | Pedestrian <br> Total |
| $1-2 \mathrm{PM}$ | 272 | 322 |
| $12-1 \mathrm{PM}$ | 259 | 546 |
| $3-4 \mathrm{PM}$ | 233 | 570 |
| $3-4 \mathrm{PM}$ | 175 | 208 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $1-2$ PM | 272 | 322 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \mathbf{0} \\ & \text { in } \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{0}{\top} \\ & \text { N } \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{\prime} \end{aligned}$ | $\begin{aligned} & \sum_{<}^{\infty} \\ & \\ & \end{aligned}$ | $\begin{aligned} & \sum \\ & \dot{4} \\ & 0 \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{Q}{N} \\ & \underset{N}{2} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{\sim}{N} \\ & \underset{i}{N} \end{aligned}$ |
| Major | 298 | 272 | 256 | 249 | 232 | 230 | 213 | 194 |
| Minor | 300 | 265 | 164 | 197 | 289 | 315 | 167 | 201 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{ }$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{\square}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{\text {c }}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \sum_{0} \\ & \text { 0 } \\ & \hline \end{aligned}$ | $\begin{aligned} & \sum_{0}^{2} \\ & \text { in } \end{aligned}$ |  | $\begin{aligned} & \sum_{n} \\ & \underset{N}{N} \end{aligned}$ | $\underset{\substack{\sum \\ \multirow{1}{N}{}}}{ }$ | $\begin{aligned} & \Sigma \\ & \underset{<}{\Sigma} \\ & \infty \\ & \infty \end{aligned}$ | $\begin{aligned} & \underset{0}{\Sigma} \\ & \end{aligned}$ |  |
| Major | 298 | 272 | 256 | 249 | 232 | 230 | 213 | 194 |
| Minor | 300 | 265 | 164 | 197 | 289 | 315 | 167 | 201 |

Existing Volumes





## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
|  | Major <br> Street | Pedestrian <br> Total |
|  | 4-5 PM | 298 |
| $124-1 \mathrm{PM}$ | 249 | 111 |
| $11-12 \mathrm{PM}$ | 256 | 96 |
| $11-12 \mathrm{PM}$ | 194 | 91 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $4-5$ PM | 298 | 124 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


| Engineer: | John P Diediker |
| ---: | :--- |
| Date: |  |


| Lanes: | $\mathbf{2}$ | Major Approach Speed:$\mathbf{2 5}$ <br> Lanes: <br> $\mathbf{2}$ $\mathbf{M i n o r}$ Approach Speed: |
| :--- | :--- | :--- |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\underset{\substack{\infty \\ \underset{N}{i} \\ \hline}}{ }$ | $\begin{aligned} & \Sigma \underset{1}{\Sigma} \\ & 0 \\ & \infty \end{aligned}$ | $$ | $\sum$ 0 0 0 0 | $\begin{aligned} & \underset{\sim}{\Sigma} \\ & \underset{N}{N} \end{aligned}$ | $\Sigma$ $\underset{N}{\Sigma}$ $\stackrel{N}{\Sigma}$ |  | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \mathbf{N} \end{aligned}$ |
| Major | 393 | 382 | 348 | 311 | 271 | 265 | 257 | 247 |
| Minor | 365 | 377 | 306 | 250 | 203 | 163 | 151 | 169 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{\gtrless}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \underset{6}{\Sigma} \\ & \underset{\infty}{1} \\ & \infty \end{aligned}$ | $\sum$ <br> 0 <br> $i 0$ |  | $\begin{aligned} & \sum_{\mathbf{N}}^{+} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \underset{\sim}{J} \end{aligned}$ | E N N |
| Major | 393 | 382 | 348 | 311 | 271 | 265 | 257 | 247 |
| Minor | 365 | 377 | 306 | 250 | 203 | 163 | 151 | 169 |

Existing Volumes





## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes <br> Street | Pedestrian <br> Total |
| $4-5 \mathrm{PM}$ | 348 | 85 |
| $7-8 \mathrm{AM}$ | 393 | 78 |
| $11-12 \mathrm{PM}$ | 271 | 67 |
| $11-12 \mathrm{PM}$ | 265 | 50 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $4-5$ PM | 348 | 85 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

| City: |  |
| ---: | :--- |
| County: |  |
| District: |  |
|  |  |
| Major Street: | Lincoln |
| Minor Street: |  |


| Engineer: | John P Diediker |
| ---: | ---: |
| Date: |  |


| Lanes: | $\mathbf{4}$ | Major Approach Speed:$\mathbf{3 0}$ <br> Lanes: <br> $\mathbf{2}$ $\mathbf{M i n o r}$ Approach Speed: |
| :--- | :--- | :--- |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied(should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { a }}$ | $\mathbf{8 0 \% ^ { \mathbf { b } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{<}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \sum_{0}^{5} \\ & 0 \\ & i \end{aligned}$ | $\begin{aligned} & \Sigma_{0}^{5} \\ & 00 \\ & 4 \end{aligned}$ | n ¢ ¢ | $\begin{aligned} & \Sigma \\ & \underset{4}{6} \\ & \text { o } \\ & \infty \end{aligned}$ | E N N N | S N N | S N N N |
| Major | 1,373 | 1,151 | 1,096 | 1,070 | 1,064 | 689 | 649 | 593 |
| Minor | 255 | 165 | 178 | 107 | 254 | 116 | 89 | 121 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \sum_{k}^{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \sum_{0}^{2} \\ & 0 \\ & \text { in } \end{aligned}$ | $\sum$ 0 0 0 | n ¢ ¢ | $\sum$ 4 0 0 | S N N | N $\sim$ $\sim$ $\sim$ | S N N T |
| Major | 1,373 | 1,151 | 1,096 | 1,070 | 1,064 | 689 | 649 | 593 |
| Minor | 255 | 165 | 178 | 107 | 254 | 116 | 89 | 121 |

Existing Volumes





## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1 \mathrm{PM}$ | 689 | 56 |
| $5-6 \mathrm{PM}$ | 1151 | 50 |
| 8-9 AM | 1096 | 49 |
| 8-9 AM | 1064 | 49 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | ---: |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 689 | 56 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

| City: |  |
| ---: | :--- |
| County: |  |
| District: |  |
|  |  |
| Major Street: |  |
| Minor Street: |  |


| Engineer: | John P Diediker |
| ---: | ---: |
| Date: |  |


| Lanes: | $\mathbf{4}$ | Major Approach Speed:$\mathbf{3 0}$ <br> Lanes: <br> $\mathbf{2}$ $\mathbf{M i n o r ~ A p p r o a c h ~ S p e e d : ~}$ |
| :--- | :--- | :--- |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\underset{\substack{\infty \\ \underset{N}{i} \\ \hline}}{ }$ |  | $\begin{aligned} & \Sigma \\ & \Sigma_{0} \\ & 0 \\ & \stackrel{1}{0} \end{aligned}$ | $\begin{aligned} & \underset{1}{\Sigma} \\ & \underset{\infty}{\infty} \\ & \infty \end{aligned}$ |  | $\begin{aligned} & \sum_{0} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | $\sum$ n N N |
| Major | 1,729 | 1,571 | 1,387 | 1,248 | 1,115 | 870 | 860 | 850 |
| Minor | 194 | 120 | 98 | 176 | 54 | 89 | 66 | 73 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{<}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \sum_{0}^{5} \\ & 0 \\ & \hline \end{aligned}$ | $\sum$ 0 0 0 10 | $\sum$ 4 0 0 | n n ¢ ¢ | S ¢ N | $\begin{aligned} & \underset{N}{N} \\ & \underset{N}{N} \\ & \underset{V}{2} \end{aligned}$ | $\sum$ N N N |
| Major | 1,729 | 1,571 | 1,387 | 1,248 | 1,115 | 870 | 860 | 850 |
| Minor | 194 | 120 | 98 | 176 | 54 | 89 | 66 | 73 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $7-8 \mathrm{AM}$ | 1729 | 63 |
| $4-5 \mathrm{PM}$ | 1571 | 61 |
| $8-9 \mathrm{AM}$ | 870 | 47 |
| $8-9 \mathrm{AM}$ | 1248 | 44 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $7-8$ AM | 1729 | 63 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

|  | Lincoln | Engineer: Date: | John P Diediker |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | January 15, 2020 |  |
|  |  |  |  |  |
| Major Street: | Q St | Lanes: 4 | Major Approach Speed: | 25 |
| Minor Street: | 13th St | Lanes: $\mathbf{2}$ | Minor Approach Speed: | 25 |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

\begin{tabular}{|c|c|c|c|c|c|c|c|c|}
\hline \multirow[b]{2}{*}{Street} \& \multicolumn{8}{|c|}{Eight Highest Hours} <br>
\hline \& $$
\begin{aligned}
& \Sigma \\
& \mathbf{N} \\
& 0 \\
& 0
\end{aligned}
$$ \& $$
\begin{aligned}
& \Sigma \\
& \sum_{0} \\
& 0
\end{aligned}
$$ \& $$
\begin{aligned}
& \sum_{N} \\
& \underset{N}{N}
\end{aligned}
$$ \& E
N
N \& $$
\begin{aligned}
& \sum \\
& \dot{4} \\
& 0 \\
& \infty
\end{aligned}
$$ \&  \&  \& $\sum$

¢
N <br>
\hline Major \& 961 \& 942 \& 877 \& 751 \& 713 \& 709 \& 693 \& 669 <br>
\hline Minor \& 85 \& 65 \& 90 \& 69 \& 53 \& 46 \& 80 \& 60 <br>
\hline
\end{tabular}

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{ }$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{\square}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\sum_{0}$ 0 0 | $\begin{aligned} & \sum_{0}^{2} \\ & i \\ & \hline \end{aligned}$ | S N N | E N N N | $\begin{aligned} & \sum \\ & \underset{4}{8} \\ & \dot{0} \\ & \infty \end{aligned}$ | $\sum$ $\underset{\sim}{\infty}$ $\underset{N}{\infty}$ | $\begin{aligned} & \sum \\ & \underset{\leftarrow}{\Sigma} \\ & \underset{i}{\top} \end{aligned}$ | E N N |
| Major | 961 | 942 | 877 | 751 | 713 | 709 | 693 | 669 |
| Minor | 85 | 65 | 90 | 69 | 53 | 46 | 80 | 60 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1 \mathrm{PM}$ | 210 | 225 |
| $1-2 \mathrm{PM}$ | 210 | 147 |
| $2-3 \mathrm{PM}$ | 186 | 148 |
| $2-3 \mathrm{PM}$ | 149 | 113 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 210 | 225 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\underset{\substack{\underset{\sim}{\infty} \\ \underset{N}{2}}}{ }$ |  | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{\prime} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & N \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{n} \\ & \underset{N}{\prime} \end{aligned}$ | $\begin{aligned} & \sum_{0}^{2} \\ & 0 \\ & \text { P } \end{aligned}$ | E 0 0 0 |
| Major | 387 | 421 | 611 | 687 |  |  | 776 | 969 |
| Minor | 76 | 69 | 268 | 318 |  |  | 204 | 279 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{\square}$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{\gtrless}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \underset{\alpha}{\Sigma} \\ & \underset{\infty}{1} \\ & \infty \end{aligned}$ |  | S 「 N | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & N \end{aligned}$ | $\begin{aligned} & \sum_{n} \\ & \underset{\text { N }}{ } \end{aligned}$ | $$ | E 0 0 0 |
| Major | 387 | 421 | 611 | 687 |  |  | 776 | 969 |
| Minor | 76 | 69 | 268 | 318 |  |  | 204 | 279 |

Existing Volumes





## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1 \mathrm{PM}$ | 687 | 295 |
| $4-5 \mathrm{PM}$ | 776 | 225 |
| $5-6 \mathrm{PM}$ | 611 | 214 |
| $5-6 \mathrm{PM}$ | 969 | 177 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 687 | 295 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Yes _ No
Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfiedYes $\checkmark$ No (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\sum$ 0 0 0 | $\begin{aligned} & \Sigma \\ & \underset{0}{2} \\ & 0 \end{aligned}$ |  |  | E N N | $\begin{aligned} & \underset{<}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | $\sum$ 4 0 0 |
| Major | 1,647 | 1,610 | 1,497 | 1,422 | 1,379 | 1,278 | 1,259 | 1,232 |
| Minor | 292 | 343 | 224 | 247 | 218 | 126 | 201 | 120 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \sum_{0}^{n} \\ & \underset{\sim}{0} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{0}{\Sigma} \\ & 0 \\ & i \end{aligned}$ | n N ¢ |  | n N - | $\sum$ $\substack{\infty \\ \sim}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{\sim}{N} \end{aligned}$ | $\sum$ 4 0 0 |
| Major | 1,647 | 1,610 | 1,497 | 1,422 | 1,379 | 1,278 | 1,259 | 1,232 |
| Minor | 292 | 343 | 224 | 247 | 218 | 126 | 201 | 120 |

## Existing Volumes






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 1422 | 436 |
| $11-12 \mathrm{PM}$ | 1259 | 301 |
| $3-4 \mathrm{PM}$ | 1379 | 285 |
| $3-4 \mathrm{PM}$ | 1497 | 209 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 1422 | 436 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Yes _ No
Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfiedYes $\checkmark$ No (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \sum_{0}^{2} \\ & 0 \\ & 8 \end{aligned}$ | $\begin{aligned} & \sum_{i}^{5} \\ & 0 \\ & i \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{\prime} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{\Omega}{N} \\ & \underset{\sim}{N} \end{aligned}$ | $\sum$ $\vdots$ 0 $\infty$ | $\underset{\substack{\infty \\ \underset{N}{i} \\ \hline}}{ }$ | $\begin{aligned} & \Sigma \\ & \underset{0}{1} \\ & \text { N } \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{Q}{N} \\ & \underset{i}{T} \end{aligned}$ |
| Major | 354 | 340 | 272 | 259 | 254 | 248 | 243 | 202 |
| Minor | 367 | 325 | 282 | 274 | 327 | 255 | 315 | 205 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{\text {c }}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma \\ & \begin{array}{l} 0 \\ 0 \\ 7 \end{array} \end{aligned}$ | $\begin{aligned} & \sum \\ & \mathbf{n} \\ & \text { io } \\ & i \end{aligned}$ |  | $\begin{aligned} & \sum_{0} \\ & \end{aligned}$ | $\begin{aligned} & \sum \\ & \underset{\alpha}{\circ} \\ & \dot{\infty} \end{aligned}$ | $\begin{aligned} & \sum \\ & \stackrel{\sum}{\infty} \\ & \stackrel{i}{2} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{\Omega}{2} \\ & \ddagger \end{aligned}$ |  |
| Major | 354 | 340 | 272 | 259 | 254 | 248 | 243 | 202 |
| Minor | 367 | 325 | 282 | 274 | 327 | 255 | 315 | 205 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 272 | 233 |
| $11-12 \mathrm{PM}$ | 202 | 165 |
| $4-5 \mathrm{PM}$ | 259 | 134 |
| $4-5 \mathrm{PM}$ | 354 | 129 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 272 | 233 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


| Engineer: | John P Diediker |
| ---: | :--- |
| Date: |  |


| Lanes: | $\mathbf{2}$ | Major Approach Speed:$\mathbf{2 5}$ <br> Lanes: <br> $\mathbf{2}$ $\mathbf{M i n o r}$ Approach Speed: |
| :--- | :--- | :--- |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \sum_{0} \\ & 0 \\ & \dot{N} \end{aligned}$ | $\begin{aligned} & \sum_{n}^{5} \\ & 0 \\ & ? \end{aligned}$ | E - N | $\begin{aligned} & \sum \\ & \underset{\sim}{\infty} \\ & \underset{N}{2} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \underset{<}{\Sigma} \\ & \hline \mathbf{\infty} \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{2} \\ & \underset{N}{7} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{i}{T} \end{aligned}$ |
| Major | 505 | 464 | 428 | 423 | 397 | 388 | 361 | 336 |
| Minor | 453 | 511 | 394 | 261 | 315 | 294 | 352 | 334 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

\begin{tabular}{|c|c|c|c|c|c|c|c|c|}
\hline \multicolumn{9}{|c|}{Eight Highest Hours} <br>
\hline Street \& $$
\begin{aligned}
& \sum_{0} \\
& 0 \\
& i
\end{aligned}
$$ \& $$
\begin{aligned}
& \Sigma_{0}^{2} \\
& \substack{0 \\
\hline}
\end{aligned}
$$ \&  \& $\sum$
$\underset{\sim}{\infty}$
$\sim$ \& S

N \& $$
\begin{aligned}
& \Sigma \\
& \underset{4}{0} \\
& 0 \\
& \infty
\end{aligned}
$$ \& $\sum$

0
¢ \& E
N
N
N <br>
\hline Major \& 505 \& 464 \& 428 \& 423 \& 397 \& 388 \& 361 \& 336 <br>
\hline Minor \& 453 \& 511 \& 394 \& 261 \& 315 \& 294 \& 352 \& 334 <br>
\hline
\end{tabular}

Existing Volumes





## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 428 | 173 |
| $11-12 \mathrm{PM}$ | 336 | 126 |
| $4-5 \mathrm{PM}$ | 397 | 118 |
| $4-5 \mathrm{PM}$ | 464 | 116 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 428 | 173 |



* Note: 133 pph applies as the lower threshold volume

Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

| City: |  |
| ---: | :--- |
| County: |  |
| District: |  |
|  |  |
| Major Street: | Lincoln |
| Minor Street: |  |


| Engineer: | John P Diediker |
| ---: | ---: |
| Date: |  |


| Lanes: | $\mathbf{4}$ | Major Approach Speed: |
| :--- | :--- | :--- |
| Lanes: | $\mathbf{3 0}$ |  |
|  | Minor Approach Speed: |  |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.

Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied
$\qquad$ No (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| :---: | :---: | :---: |
| 80\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \sum_{\mathbb{K}}^{\infty} \\ & \underset{N}{i} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \Sigma \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ | $\sum$ 4 0 $\infty$ | $\begin{aligned} & \Sigma_{0} \\ & \underset{N}{7} \end{aligned}$ | $\begin{aligned} & \sum_{\mathbf{N}}^{+} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{i}{N} \\ & \underset{V}{\top} \end{aligned}$ | E N N |
| Major | 1,486 | 1,323 | 1,259 | 1,118 | 1,115 | 728 | 715 | 692 |
| Minor | 204 | 641 | 561 | 260 | 354 | 382 | 383 | 338 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{\square}$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\boxed{\square}$ Yes | $\square$ No | No


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{\gtrless}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \sum_{0}^{2} \\ & 0 \\ & \text { in } \end{aligned}$ | $\sum$ 0 0 8 | $\sum$ 4 0 $\infty$ | $\sum$ 0 N M | S N N | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | E N N |
| Major | 1,486 | 1,323 | 1,259 | 1,118 | 1,115 | 728 | 715 | 692 |
| Minor | 204 | 641 | 561 | 260 | 354 | 382 | 383 | 338 |

Existing Volumes





## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 728 | 116 |
| $11-12 \mathrm{PM}$ | 715 | 82 |
| $4-5 \mathrm{PM}$ | 1323 | 57 |
| $4-5 \mathrm{PM}$ | 1259 | 55 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 728 | 116 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

| City: |  |
| ---: | :--- |
| County: |  |
| District: |  |
|  |  |
| Major Street: |  |
| Minor Street: |  |


| Engineer: | John P Diediker |
| ---: | ---: |
| Date: |  |


| Lanes: | $\mathbf{4}$ | Major Approach Speed:$\mathbf{3 0}$ <br> Lanes: <br> $\mathbf{2}$ $\mathbf{M i n o r ~ A p p r o a c h ~ S p e e d : ~}$ |
| :--- | :--- | :--- |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| $70 \%$ Satisfied: | $\boxed{ }$ Yes | $\square$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{2}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{《}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \sum_{0}^{5} \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \sum_{0} \\ & 0 \\ & \dot{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{4}{1} \\ & 0 \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \sum_{n} \\ & \underset{N}{J} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{\sim}{\Sigma} \\ & \underset{\sim}{N} \end{aligned}$ | $\begin{aligned} & \sum_{0} \\ & \underset{N}{N} \\ & \underset{\Gamma}{2} \end{aligned}$ | E 0 N N |
| Major | 1,510 | 1,409 | 1,302 | 1,144 | 1,071 | 787 | 746 | 675 |
| Minor | 363 | 148 | 368 | 236 | 172 | 223 | 180 | 204 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{\square}$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\boxed{\square}$ Yes | $\square$ No | No


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{\gtrless}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \sum \\ & 0 \\ & 0 \\ & \sim \end{aligned}$ | $\sum$ 0 0 0 | $\sum$ 4 0 $\infty$ | $\sum$ 0 N M | S ¢ N | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | E $\sim$ N N |
| Major | 1,510 | 1,409 | 1,302 | 1,144 | 1,071 | 787 | 746 | 675 |
| Minor | 363 | 148 | 368 | 236 | 172 | 223 | 180 | 204 |

Existing Volumes





## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level <br> Hours Highest <br>   <br>  <br>  <br> Major <br> Street | Pedestrian <br> Total |  |
| :---: | :---: | :---: |
|  | 1409 | 60 |
| $11-12 \mathrm{PM}$ | 1071 | 49 |
| $11-12 \mathrm{PM}$ | 746 | 48 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 787 | 60 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

| City: |  |
| ---: | :--- |
| County: |  |
| District: |  |
|  |  |
| Major Street: |  |
| Minor Street: |  |


| Engineer: | John P Diediker |
| ---: | ---: |
| Date: |  |


| Lanes: | $\mathbf{4}$ | Major Approach Speed:$\mathbf{2 5}$ <br> Lanes: <br> $\mathbf{2} \quad$ Minor Approach Speed: <br>  $\mathbf{2 5}$ |
| :--- | :--- | :--- |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population < 10,000?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { a }}$ | $\mathbf{8 0 \% ^ { \mathbf { b } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma_{0} \\ & \text { o } \\ & \text { in } \end{aligned}$ | $\begin{aligned} & \Sigma \underset{\sim}{\Sigma} \\ & \underset{\sim}{N} \end{aligned}$ |  | 5 0 0 0 | $\underset{\substack{\infty \\ \underset{N}{i} \\ \hline}}{ }$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \mathbf{N} \end{aligned}$ | S a N | $\begin{aligned} & \Sigma \\ & \underset{0}{N} \\ & \underset{V}{\top} \end{aligned}$ |
| Major | 684 | 681 | 648 | 635 | 616 | 576 | 565 | 481 |
| Minor | 467 | 384 | 171 | 430 | 242 | 327 | 252 | 179 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \sum_{n}^{\Sigma} \\ & 0 \\ & i \end{aligned}$ | $\begin{aligned} & \sum_{\mathbf{N}}^{+} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \sum_{\mathbb{K}}^{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\sum$ 0 0 8 | $\begin{aligned} & \Sigma \\ & \underset{1}{6} \\ & \infty \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \underset{N}{2} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{V}{\top} \end{aligned}$ |
| Major | 684 | 681 | 648 | 635 | 616 | 576 | 565 | 481 |
| Minor | 467 | 384 | 171 | 430 | 242 | 327 | 252 | 179 |

Existing Volumes





## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 674 | 450 |
| $1-2 ~ P M$ | 569 | 324 |
| $11-12$ PM | 642 | 320 |
| $11-12 ~ P M$ | 869 | 267 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 674 | 450 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

| City: |  |
| ---: | :--- |
| County: |  |
| District: |  |
| Major Street: |  |
| Minor Street: |  |


| Engineer: | John P Diediker |
| ---: | ---: |
| Date: |  |


| Lanes: | $\mathbf{3}$ |
| :--- | :--- |
| Lanes: |  |

Major Approach Speed $\qquad$
MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population < 10,000 ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{2}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions A and B after adequate trial of other remedial measures
${ }^{\text {c }}$ May be used when the maior-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \Sigma \\ & \begin{array}{l} \Sigma \\ \hline \end{array} \\ & i \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \text { Le } \end{aligned}$ | $\begin{aligned} & \underset{\sim}{\sum} \\ & \underset{\sim}{N} \end{aligned}$ | $\begin{aligned} & \underset{0}{\Sigma} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{\prime} \\ & \underset{N}{J} \end{aligned}$ |  | $\begin{aligned} & \underset{<}{\Sigma} \\ & \dot{\infty} \\ & \dot{\infty} \end{aligned}$ | $\underset{\substack{\sum \\ \multirow{1}{N}{}}}{ }$ |
| Major | 869 | 806 | 674 | 642 | 642 | 569 | 408 | 357 |
| Minor | 283 | 288 | 273 | 240 | 186 | 250 | 181 | 136 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{ }$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{\square}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{\text {c }}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \sum_{0} \\ & \text { in } \end{aligned}$ | $\begin{aligned} & \Sigma_{0}^{2} \\ & \text { 0 } \end{aligned}$ | $\begin{aligned} & \sum_{0} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \underset{0}{\Sigma} \\ & \end{aligned}$ | $\begin{aligned} & \sum \\ & \underset{0}{J} \\ & \text { J } \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \underset{<}{\Sigma} \\ & \dot{\phi} \end{aligned}$ | $\stackrel{\underset{\sim}{\infty}}{\stackrel{\infty}{\sim}}$ |
| Major | 869 | 806 | 674 | 642 | 642 | 569 | 408 | 357 |
| Minor | 283 | 288 | 273 | 240 | 186 | 250 | 181 | 136 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 674 | 329 |
| $11-12$ PM | 569 | 211 |
| $1-2$ PM | 642 | 184 |
| $1-2 ~ P M$ | 869 | 132 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | ---: |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $5-6$ PM | 869 | 283 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Yes _ No
Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfiedYes $\checkmark$ No (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $$ | $\begin{aligned} & \Sigma \\ & \mathbf{n} \\ & \mathbf{N} \end{aligned}$ | 5 0 0 0 | n - N | S N N | $\underset{\substack{\infty \\ \underset{N}{\infty} \\ \hline}}{ }$ |  | $\sum$ 4 0 0 |
| Major | 1,608 | 1,504 | 1,494 | 1,475 | 1,416 | 1,361 | 1,308 | 1,290 |
| Minor | 320 | 212 | 286 | 247 | 196 | 118 | 194 | 201 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{V}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| 100\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| 80\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| $70 \%$ Satisfied: | $\boxed{ }$ Yes | $\square$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | ¢ | $\begin{aligned} & \Sigma \\ & \underset{n}{2} \\ & \text { M } \end{aligned}$ | $\sum$ 0 0 0 0 |  | E N N | $\sum$ $\substack{\infty \\ \sim}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{T} \end{aligned}$ | $\sum$ 4 0 0 0 |
| Major | 1,608 | 1,504 | 1,494 | 1,475 | 1,416 | 1,361 | 1,308 | 1,290 |
| Minor | 320 | 212 | 286 | 247 | 196 | 118 | 194 | 201 |

## Existing Volumes






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 1475 | 263 |
| $11-12 \mathrm{PM}$ | 1308 | 154 |
| $1-2 \mathrm{PM}$ | 1416 | 115 |
| $1-2 \mathrm{PM}$ | 1608 | 82 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\sqrt{ }$ Yes | $\square$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 1475 | 263 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

| City: |  |
| ---: | :--- |
| County: |  |
| District: |  |
|  |  |
| Major Street: |  |
| Minor Street: |  |


| Engineer: | John P Diediker |
| ---: | ---: |
| Date: |  |


| Lanes: | $\mathbf{2}$ |
| :--- | :--- |
| Lanes: |  |

Major Approach Speed $\qquad$
MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population < 10,000 ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions A and B after adequate trial of other remedial measures
${ }^{\text {c }}$ May be used when the maior-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\underset{\substack{\sum \\ \multirow{2}{\|}{}}}{ }$ | $\begin{aligned} & \Sigma \\ & \underset{\alpha}{8} \\ & \dot{\infty} \end{aligned}$ |  | $\begin{aligned} & \Sigma \\ & \mathbf{n} \\ & \text { in } \end{aligned}$ | $\frac{\Sigma}{\underset{N}{N}}$ | $\begin{aligned} & \underset{0}{\Sigma} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \sum_{0} \\ & \ddagger \end{aligned}$ |  |
| Major | 319 | 298 | 271 | 265 | 257 | 254 | 241 | 221 |
| Minor | 254 | 258 | 341 | 346 | 309 | 260 | 255 | 284 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{\gtrless}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \underset{6}{\Sigma} \\ & \underset{\infty}{1} \\ & \infty \end{aligned}$ | $\sum$ 0 0 8 | $\sum$ 0 0 0 |  | E N N | $\sum$ 0 ¢ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ |
| Major | 319 | 298 | 271 | 265 | 257 | 254 | 241 | 221 |
| Minor | 254 | 258 | 341 | 346 | 309 | 260 | 255 | 284 |

Existing Volumes





## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level <br> Four Highest <br> Hours | Volumes |  |
| :---: | :---: | :---: |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 257 | 413 |
| $1-2 \mathrm{PM}$ | 254 | 228 |
| $11-12 \mathrm{PM}$ | 221 | 222 |
| $11-12 \mathrm{PM}$ | 241 | 139 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 257 | 413 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


| Engineer: | John P Diediker |
| ---: | :--- |
| Date: |  |


| Lanes: | $\mathbf{2}$ | Major Approach Speed:$\mathbf{2 5}$ <br> Lanes: <br> $\mathbf{2}$ $\mathbf{M i n o r}$ Approach Speed: |
| :--- | :--- | :--- |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{\sim}{n} \end{aligned}$ | E N N N | $\underset{\text { E }}{\text { E }}$ | $\begin{aligned} & \sum_{0}^{N} \\ & \frac{N}{\Gamma} \end{aligned}$ | $\begin{aligned} & \sum \\ & k \\ & \infty \\ & \infty \\ & \infty \end{aligned}$ | $\underset{\substack{\sum \\ \multirow{4}{\infty}{\sim}\\ \sim}}{ }$ |
| Major | 581 | 489 | 371 | 353 | 291 | 290 | 263 | 251 |
| Minor | 300 | 323 | 235 | 284 | 269 | 288 | 348 | 373 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma \\ & \underset{0}{\Sigma} \\ & \underset{\sim}{n} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{0}{2} \\ & 0 \\ & i \end{aligned}$ | E N N | E N N | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{2} \end{aligned}$ | $\begin{aligned} & \sum_{0} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{4}{6} \\ & \infty \\ & \infty \end{aligned}$ | $\sum$ $\substack{\text { ¢ }}$ $\sim$ |
| Major | 581 | 489 | 371 | 353 | 291 | 290 | 263 | 251 |
| Minor | 300 | 323 | 235 | 284 | 269 | 288 | 348 | 373 |

Existing Volumes





## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 291 | 232 |
| $11-12 \mathrm{PM}$ | 290 | 160 |
| $1-2 \mathrm{PM}$ | 371 | 122 |
| $1-2 \mathrm{PM}$ | 581 | 118 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 291 | 232 |



* Note: 133 pph applies as the lower threshold volume

Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

| City: |  |
| ---: | :--- |
| County: |  |
| District: |  |
|  |  |
| Major Street: |  |
| Minor Street: |  |


| Engineer: | John P Diediker |
| ---: | ---: |
| Date: |  |


| Lanes: | $\mathbf{3}$ | Major Approach Speed: |
| :--- | :--- | :--- |
| Lanes: | $\mathbf{3 0}$ |  |
|  | Minor Approach Speed |  |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population < 10,000?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { a }}$ | $\mathbf{8 0 \% ^ { \mathbf { b } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{\gtrless}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \sum_{0}^{2} \\ & 0 \\ & 8 \end{aligned}$ | $\begin{aligned} & \sum \underset{1}{2} \\ & 0 \\ & \infty \end{aligned}$ | $\begin{aligned} & \sum_{0} \\ & \varphi \\ & \dot{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \vdots \\ & \pm \end{aligned}$ | $\begin{aligned} & \underset{N}{\Sigma} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \underset{\sim}{2} \end{aligned}$ | E N N T |
| Major | 1,611 | 1,310 | 1,298 | 1,282 | 1,175 | 862 | 777 | 712 |
| Minor | 365 | 251 | 307 | 244 | 257 | 241 | 222 | 189 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{\square}$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\boxed{\square}$ Yes | $\square$ No | No


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{\gtrless}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \sum \\ & 0 \\ & 0 \\ & \sim \end{aligned}$ | $\sum$ 4 0 0 | $\sum$ 0 0 0 0 | n n ¢ | S N N | N $\sim$ $\sim$ $\sim$ | S N N T |
| Major | 1,611 | 1,310 | 1,298 | 1,282 | 1,175 | 862 | 777 | 712 |
| Minor | 365 | 251 | 307 | 244 | 257 | 241 | 222 | 189 |

## Existing Volumes






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $7-8 \mathrm{AM}$ | 1611 | 182 |
| $12-1 \mathrm{PM}$ | 862 | 171 |
| $4-5 \mathrm{PM}$ | 1310 | 139 |
| $4-5 \mathrm{PM}$ | 712 | 138 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $7-8$ AM | 1611 | 182 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

| City: |  |
| ---: | :--- |
| County: |  |
| District: |  |
| Major Street: |  |
| Minor Street: |  |


| Engineer: | John P Diediker |
| ---: | ---: |
| Date: |  |


| Lanes: | $\mathbf{4}$ | Major Approach Speed:$\mathbf{3 0}$ <br> Lanes: <br> $\mathbf{2}$ $\mathbf{M i n o r ~ A p p r o a c h ~ S p e e d : ~}$ |
| :--- | :--- | :--- |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population < 10,000 ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions A and B after adequate trial of other remedial measures
${ }^{\text {c }}$ May be used when the maior-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \sum_{0} \\ & \text { L } \end{aligned}$ | $\begin{aligned} & \sum_{0} \\ & i \\ & i \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \stackrel{\Sigma}{<} \\ & \stackrel{i}{\prime} \\ & \end{aligned}$ | $\begin{aligned} & \sum_{0} \\ & \text { J } \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \stackrel{\Sigma}{4} \\ & \infty \\ & \infty \end{aligned}$ | $\underset{\hat{i}}{\underset{\hat{j}}{2}}$ | $\begin{aligned} & \sum_{0} \\ & \underset{N}{M} \end{aligned}$ |  |
| Major | 1,752 | 1,610 | 1,419 | 1,287 | 1,050 | 945 | 936 | 860 |
| Minor | 156 | 95 | 202 | 110 | 147 | 59 | 97 | 111 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{ }$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{\square}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \sum_{0} \\ & \underset{\sim}{0} \\ & \hline \end{aligned}$ | $\begin{aligned} & \sum_{0}^{2} \\ & 0 \\ & \text { in } \end{aligned}$ | $\sum$ $\substack{\infty \\ \sim}$ | n n ¢ | $\begin{aligned} & \sum \\ & \dot{4} \\ & 0 \\ & \infty \end{aligned}$ | $$ | n n N $\sim$ | ¢ ¢ N |
| Major | 1,752 | 1,610 | 1,419 | 1,287 | 1,050 | 945 | 936 | 860 |
| Minor | 156 | 95 | 202 | 110 | 147 | 59 | 97 | 111 |

Existing Volumes





## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level <br> Hours Highest <br>   <br>  <br>  <br> Major <br> Street | Pedestrian <br> Total |  |
| :---: | :---: | :---: |
|  | 860 | 181 |
| $1-2 \mathrm{PM}$ | 858 | 110 |
| $1-2 \mathrm{PM}$ | 1287 | 109 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 860 | 181 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY
Major Street: $\qquad$

| Engineer: | John P Diediker |
| ---: | :--- |
| Date: |  |


| Lanes: | $\mathbf{3}$ |
| :--- | :--- |
| Lanes: | $\mathbf{1}$ |

Major Approach Speed $\qquad$
Minor Approach Speed:


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \boldsymbol{\Sigma} \\ & \mathbf{0} \\ & 0 \\ & i \end{aligned}$ | $$ | $\begin{aligned} & \Sigma \\ & \underset{0}{2} \\ & \text { N } \end{aligned}$ | E N N | E N N | $\begin{aligned} & \underset{i}{\Sigma} \\ & \underset{\sim}{\Gamma} \end{aligned}$ | $\begin{aligned} & \sum \\ & \dot{k} \\ & 0 \\ & \infty \end{aligned}$ | $\underset{\substack{\sum \\ \multirow{1}{*}{N}\\ N}}{ }$ |
| Major | 756 | 700 | 570 | 552 | 521 | 448 | 307 | 305 |
| Minor | 38 | 30 | 28 | 53 | 42 | 37 | 26 | 23 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

\begin{tabular}{|c|c|c|c|c|c|c|c|c|}
\hline \multicolumn{9}{|c|}{Eight Highest Hours} <br>
\hline Street \& $$
\begin{aligned}
& \Sigma \\
& \mathbf{0} \\
& \mathbf{0} \\
& \dot{i}
\end{aligned}
$$ \& $$
\begin{aligned}
& \Sigma \\
& \underset{0}{5} \\
& \underset{\sim}{n}
\end{aligned}
$$ \& $\sum$
N
¢ \& E

N \& $\sum$
E

N \& $$
\begin{aligned}
& \sum \\
& \underset{\sim}{\top} \\
& \underset{\sim}{N}
\end{aligned}
$$ \&  \& $\underset{\substack{\sum \\ \multirow{2}{\infty}{N}\\ N}}{ }$ <br>

\hline Major \& 756 \& 700 \& 570 \& 552 \& 521 \& 448 \& 307 \& 305 <br>
\hline Minor \& 38 \& 30 \& 28 \& 53 \& 42 \& 37 \& 26 \& 23 <br>
\hline
\end{tabular}






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1 \mathrm{PM}$ | 90 | 45 |
| $11-12 \mathrm{AM}$ | 82 | 21 |
| $4-5 \mathrm{PM}$ | 48 | 19 |
| $4-5 \mathrm{PM}$ | 46 | 26 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| Peak Hour | Volumes |  |
| :---: | :---: | :---: |
|  | Major <br> Street | Pedestrian <br> Total |
|  | 90 | 45 |



* Note: 133 pph applies as the lower threshold volume

Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \underset{\varangle}{\Sigma} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \sum \\ & \mathbb{\varangle} \\ & 0 \\ & \infty \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \mathbf{p} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{n} \\ & 0 \\ & i \end{aligned}$ |  | $\begin{aligned} & \Sigma_{\mathrm{N}} \\ & \underset{N}{\mathbf{N}} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{0}{N} \\ & N \end{aligned}$ | E N N E |
| Major | 351 | 308 | 292 | 265 | 239 | 201 | 196 | 164 |
| Minor | 73 | 66 | 174 | 91 | 88 | 61 | 67 | 43 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\xrightarrow{\sum}$ | $\begin{aligned} & \sum \\ & \underset{4}{0} \\ & \infty \\ & \infty \end{aligned}$ | $\sum$ 0 0 0 8 | E 0 0 0 | E Q ¢ M | $\underset{\text { E }}{\text { E }}$ | S N N |  |
| Major | 351 | 308 | 292 | 265 | 239 | 201 | 196 | 164 |
| Minor | 73 | 66 | 174 | 91 | 88 | 61 | 67 | 43 |

Existing Volumes





## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level <br> Hours Highest <br>   <br>  <br>  <br> Major <br> Street | Pedestrian <br> Total |  |
| :---: | :---: | :---: |
|  | 164 | 132 |
| $3-4 \mathrm{PM}$ | 196 | 112 |
| $3-4 \mathrm{PM}$ | 239 | 53 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 201 | 167 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


| Engineer: | John P Diediker |
| ---: | :--- |
| Date: |  |


| Lanes: $\quad \mathbf{3}$ |
| :--- |
| Lanes: $\quad \mathbf{2}$ |

Major Approach Speed: $\qquad$
Minor Approach Speed:
MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \Psi \\ & \text { N } \end{aligned}$ | $\sum$ $\substack{\text { ¢ }}$ $\sim$ | $\underset{\sim}{\Sigma}$ | $\sum$ $\underset{\sim}{\Sigma}$ $\underset{~}{\Sigma}$ | E N N | $\sum$ $\substack{\text { a }}$ 0 0 |
| Major | 566 | 539 | 382 | 357 | 345 | 325 | 297 | 286 |
| Minor | 33 | 37 | 24 | 106 | 35 | 22 | 40 | 63 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{ }$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{\square}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{\text {c }}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma \\ & \begin{array}{l} 0 \\ 0 \\ 4 \end{array} \end{aligned}$ | $\begin{aligned} & \sum \\ & \mathbf{n} \\ & \text { io } \\ & i \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \vdots \\ & \vdots \\ & j \end{aligned}$ | $\begin{aligned} & \sum_{<}^{\infty} \\ & \stackrel{\infty}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{\prime} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \underset{0}{\Sigma} \\ & \underset{\sim}{N} \end{aligned}$ | $\begin{aligned} & \sum \\ & \underset{\infty}{\infty} \\ & \dot{\infty} \end{aligned}$ |
| Major | 566 | 539 | 382 | 357 | 345 | 325 | 297 | 286 |
| Minor | 33 | 37 | 24 | 106 | 35 | 22 | 40 | 63 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
|  | $\|c\|$ <br>  <br>  <br> Street | Pedumes <br> Total |
| $12-1 \mathrm{PM}$ | 345 | 188 |
| $3-4 \mathrm{PM}$ | 382 | 130 |
| $11-12 \mathrm{PM}$ | 297 | 125 |
| $11-12 \mathrm{PM}$ | 325 | 92 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 345 | 188 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

| City: |  |
| ---: | :--- |
| County: |  |
| District: |  |
|  |  |
| Major Street: |  |
| Minor Street: |  |


| Engineer: | John P Diediker |
| ---: | ---: |
| Date: |  |


| Lanes: | $\mathbf{4}$ | Major Approach Speed:$\mathbf{2 5}$ <br> Lanes: <br> $\mathbf{2} \quad$ Minor Approach Speed: <br>  $\mathbf{2 5}$ |
| :--- | :--- | :--- |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population < 10,000?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Yes _ No Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfiedYes $\checkmark$ No (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\square$ No |
| ---: | ---: | ---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 70\% Satisfied: | $\square$ Yes | $\square$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions A and B after adequate trial of other remedial measures
${ }^{\text {c }}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{<}{\Sigma} \\ & \stackrel{\perp}{\infty} \\ & \stackrel{1}{2} \end{aligned}$ | $\begin{aligned} & \sum_{0} \\ & \hline 0 \\ & i \end{aligned}$ | $$ | $\begin{aligned} & \sum \\ & \underset{<}{1} \\ & \infty \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma_{0} \\ & \text { J } \end{aligned}$ | $\begin{aligned} & \underset{\sim}{\Sigma} \\ & \underset{\sim}{N} \end{aligned}$ | $\begin{aligned} & \sum_{0} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \sum_{0} \\ & \underset{N}{M} \end{aligned}$ |
| Major | 1,018 | 962 | 930 | 901 | 817 | 768 | 670 | 630 |
| Minor | 138 | 362 | 314 | 124 | 289 | 275 | 209 | 239 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{\square}$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\boxed{\square}$ Yes | $\square$ No | No


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{<}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{n} \\ & 0 \\ & i \end{aligned}$ | 5 0 0 0 | $\sum$ $<$ 0 0 | $\sum$ N ¢ ¢ | $\underset{\text { E }}{\text { E }}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{n} \end{aligned}$ | $\sum$ 0 $\sim$ $\sim$ $N$ |
| Major | 1,018 | 962 | 930 | 901 | 817 | 768 | 670 | 630 |
| Minor | 138 | 362 | 314 | 124 | 289 | 275 | 209 | 239 |

Existing Volumes





## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| Four Highest Hours | Volumes |  |
| :---: | :---: | :---: |
|  | Major <br> Street | Pedestrian Total |
| 12-1 PM | 156 | 97 |
| 1-2 PM | 153 | 89 |
| 3-4 PM | 125 | 96 |
| 3-4 PM | 111 | 113 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 156 | 97 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

| City: | Lincoln |
| ---: | :--- |
| County: |  |
| District: |  |
| Major Street: | P St |
| Minor Street: |  |


| Engineer: | John P Diediker |
| ---: | ---: |
| Date: |  |


| Lanes: | $\mathbf{3}$ |
| :--- | :--- |
| Lanes: | $\mathbf{3}$ |

Major Approach Speed: $\qquad$
MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population < 10,000 ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions A and B after adequate trial of other remedial measures
${ }^{\text {c }}$ May be used when the maior-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \Sigma \\ & \\ & \substack{0 \\ \hline} \end{aligned}$ | $\begin{aligned} & \sum \\ & \mathbf{n} \\ & \text { io } \\ & i \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \vdots \\ & j \\ & \text { J } \end{aligned}$ | $\begin{aligned} & \Sigma \underset{\sim}{\Sigma} \\ & \underset{\sim}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \mathbf{\Sigma} \\ & \mathbf{N} \end{aligned}$ | $\begin{aligned} & \underset{N}{\Sigma} \\ & \underset{N}{N} \end{aligned}$ | $\sum$ $\underset{\Sigma}{\Sigma}$ $\stackrel{N}{\Sigma}$ | $\stackrel{\Sigma}{\text { s }}$ |
| Major | 615 | 578 | 506 | 471 | 450 | 435 | 395 | 328 |
| Minor | 462 | 510 | 380 | 332 | 301 | 339 | 281 | 203 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \sum_{0} \\ & \underset{\sim}{0} \\ & \hline \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{n} \\ & 0 \\ & i \end{aligned}$ | E N N | E N N | E N N | E N N N | $\begin{aligned} & \underset{i}{\Sigma} \\ & \underset{\sim}{N} \end{aligned}$ |  |
| Major | 615 | 578 | 506 | 471 | 450 | 435 | 395 | 328 |
| Minor | 462 | 510 | 380 | 332 | 301 | 339 | 281 | 203 |

Existing Volumes





## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level <br> Four Highest <br> Hours | Volumes |  |
| :---: | :---: | :---: |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1 \mathrm{PM}$ | 67 | 35 |
| $1-2 \mathrm{PM}$ | 49 | 30 |
| $4-5 \mathrm{PM}$ | 49 | 26 |
| $4-5 \mathrm{PM}$ | 45 | 45 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| Peak Hour | Volumes |  |
| :---: | :---: | :---: |
|  | Major <br> Street | Pedestrian <br> Total |
|  | 67 | 35 |



* Note: 133 pph applies as the lower threshold volume

Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and
 inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 80\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma_{0} \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \\ & \hline \\ & \dot{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{n}{N} \\ & \underset{N}{j} \end{aligned}$ | $\sum$ $\substack{\text { c } \\ \sim \\ N}$ | E ¢ N $\sim$ | $\begin{aligned} & \Sigma \\ & \underset{n}{N} \\ & \underset{\sim}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \underset{N}{n} \end{aligned}$ | $\Sigma$ 8 0 0 0 |
| Major | 1,781 | 1,723 | 1,618 | 1,604 | 1,562 | 1,441 | 1,417 | 1,403 |
| Minor | 490 | 588 | 454 | 311 | 379 | 361 | 341 | 244 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{V}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| 100\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| 80\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| $70 \%$ Satisfied: | $\boxed{ }$ Yes | $\square$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \sum_{0} \\ & \underset{\sim}{0} \\ & \hline \end{aligned}$ | $\begin{aligned} & \sum_{0}^{2} \\ & 0 \\ & \text { in } \end{aligned}$ | n Q ¢ | $\sum$ $\substack{\text { c } \\ \sim}$ | $\begin{aligned} & \Sigma \\ & \underset{\sim}{N} \\ & \underset{N}{n} \end{aligned}$ | E N N | $\begin{aligned} & \Sigma \\ & \Sigma_{0} \\ & \underset{N}{N} \end{aligned}$ | $\sum$ 4 0 0 0 |
| Major | 1,781 | 1,723 | 1,618 | 1,604 | 1,562 | 1,441 | 1,417 | 1,403 |
| Minor | 490 | 588 | 454 | 311 | 379 | 361 | 341 | 244 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $4-5 \mathrm{PM}$ | 104 | 37 |
| $7-8 \mathrm{AM}$ | 94 | 17 |
| $12-1 \mathrm{PM}$ | 92 | 26 |
| $12-1 \mathrm{PM}$ | 73 | 37 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $4-5$ PM | 104 | 37 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \Sigma \\ & \mathbf{n} \\ & 0 \\ & i \end{aligned}$ | $\begin{aligned} & \Sigma \\ & 0 \\ & 0 \\ & 8 \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{n}{Y} \\ & \underset{N}{2} \end{aligned}$ | $\begin{aligned} & \sum_{N} \\ & \underset{\sim}{N} \end{aligned}$ | $\begin{aligned} & \sum_{<}^{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \mathbf{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{i}{T} \end{aligned}$ | $\begin{aligned} & \Sigma \underset{1}{2} \\ & 0 \\ & \infty \end{aligned}$ |
| Major | 693 | 692 | 579 | 449 | 421 | 415 | 410 | 370 |
| Minor | 175 | 229 | 192 | 213 | 279 | 195 | 153 | 265 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{ }$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{\square}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{\text {c }}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \mathbf{0} \\ & \text { in } \end{aligned}$ |  | $\begin{aligned} & \Sigma \\ & \vdots \\ & \vdots \\ & j \end{aligned}$ | $\begin{aligned} & \sum_{0} \\ & \underset{N}{N} \end{aligned}$ | $\underset{\substack{\underset{<}{\infty} \\ \underset{N}{\infty}}}{ }$ | $\begin{aligned} & \underset{0}{\boldsymbol{N}} \\ & \underset{\sim}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{0}{N} \\ & \underset{N}{N} \end{aligned}$ | $\Sigma$ $¢$ 0 0 |
| Major | 693 | 692 | 579 | 449 | 421 | 415 | 410 | 370 |
| Minor | 175 | 229 | 192 | 213 | 279 | 195 | 153 | 265 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $4-5 \mathrm{PM}$ | 692 | 85 |
| $3-4 \mathrm{PM}$ | 579 | 55 |
| $12-1 \mathrm{PM}$ | 410 | 40 |
| $12-1 \mathrm{PM}$ | 449 | 34 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $4-5$ PM | 692 | 85 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

| City: | Lincoln |
| ---: | :--- |
| County |  |
| District: | $\square$ |
| Major Street: |  |
| Minor Street: |  |

Engineer: $\quad$ John P Diediker
Date: $\quad$ January 14, 2020

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \Sigma \\ & \underset{0}{\circ} \\ & \dot{0} \end{aligned}$ | $$ | $\begin{aligned} & \Sigma \\ & \underset{N}{Y} \\ & \underset{N}{2} \end{aligned}$ | $\underset{\text { E }}{\text { E }}$ | S N N | $\begin{aligned} & \sum_{0}^{N} \\ & \underset{N}{N} \end{aligned}$ | $\underset{\substack{\infty \\ \underset{N}{i} \\ \hline}}{ }$ | $\sum$ $\substack{\text { a }}$ 0 0 |
| Major | 1,028 | 981 | 828 | 616 | 594 | 515 | 500 | 416 |
| Minor | 608 | 750 | 368 | 313 | 258 | 297 | 192 | 214 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

\begin{tabular}{|c|c|c|c|c|c|c|c|c|}
\hline \multicolumn{9}{|c|}{Eight Highest Hours} <br>
\hline Street \& $$
\begin{aligned}
& \Sigma \\
& \underset{0}{\Sigma} \\
& \hline
\end{aligned}
$$ \& $$
\begin{aligned}
& \Sigma_{0}^{2} \\
& \substack{0 \\
\hline}
\end{aligned}
$$ \& $\sum$
¢
¢
N \& E
N
N \& $\Sigma$

$\sim$ \& $$
\begin{aligned}
& \underset{N}{N} \\
& \underset{\sim}{N} \\
& \underset{V}{2}
\end{aligned}
$$ \& $\sum$

$\underset{\sim}{\infty}$
$\sim$ \& $\sum$
4
0
0 <br>
\hline Major \& 1,028 \& 981 \& 828 \& 616 \& 594 \& 515 \& 500 \& 416 <br>
\hline Minor \& 608 \& 750 \& 368 \& 313 \& 258 \& 297 \& 192 \& 214 <br>
\hline
\end{tabular}






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| Four Highest Hours | Volumes |  |
| :---: | :---: | :---: |
|  | Major <br> Street | Pedestrian Total |
| 3-4 PM | 828 | 41 |
| 7-8 AM | 500 | 35 |
| 8-9 AM | 981 | 34 |
| 8-9 AM | 416 | 32 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $3-4$ PM | 828 | 41 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

|  | Lincoln | Engineer: Date: | John P Diediker |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | January 13, 2020 |  |
|  |  |  |  |  |
| Major Street: | L St | Lanes: 4 | Major Approach Speed: | 25 |
| Minor Street: | 16th St | Lanes: 4 | Minor Approach Speed: | 25 |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| :---: | :---: | :---: |
| 80\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{\gtrless}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \sum \underset{<}{\Sigma} \\ & 0 \\ & \infty \end{aligned}$ | $\sum$ 0 0 0 |  | $\begin{aligned} & \Sigma \\ & \underset{0}{\Sigma} \\ & \underset{N}{\prime} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \mathbf{N} \\ & \mathbf{N} \end{aligned}$ | E ¢ N | $\Sigma$ E N N |
| Major | 1,833 | 1,410 | 1,090 | 1,040 | 888 | 777 | 774 | 676 |
| Minor | 445 | 387 | 1,053 | 1,037 | 701 | 480 | 548 | 419 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{\square}$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\boxed{\square}$ Yes | $\square$ No | No


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{<}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \sum \\ & \underset{4}{8} \\ & \infty \\ & \infty \end{aligned}$ | $\sum$ $\substack{0 \\ 4 \\ 8}$ | $\sum$ 0 0 0 10 | $\begin{aligned} & \Sigma \\ & \underset{N}{Y} \\ & \text { N } \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \underset{\sim}{2} \end{aligned}$ | E ¢ N | E N N N |
| Major | 1,833 | 1,410 | 1,090 | 1,040 | 888 | 777 | 774 | 676 |
| Minor | 445 | 387 | 1,053 | 1,037 | 701 | 480 | 548 | 419 |

Existing Volumes





## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |  |
| :---: | :---: | :---: |
| Hour Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $4-5 \mathrm{PM}$ | 80 | 50 |
| $12-1 \mathrm{PM}$ | 74 | 34 |
| $5-6 \mathrm{PM}$ | 72 | 48 |
| $5-6 \mathrm{PM}$ | 63 | 50 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $4-5$ PM | 80 | 50 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 80\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\sum$ 0 0 0 | $\begin{aligned} & \Sigma \\ & \Sigma_{0} \\ & 0 \\ & \stackrel{1}{0} \end{aligned}$ |  | n 0 ¢ | $\sum$ 4 0 $\infty$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | E N N | $\begin{aligned} & \underset{i}{i} \\ & \underset{N}{\Gamma} \end{aligned}$ |
| Major | 1,840 | 1,561 | 1,472 | 1,322 | 1,016 | 919 | 870 | 860 |
| Minor | 979 | 989 | 394 | 647 | 331 | 543 | 453 | 399 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{V}$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\square$ No |
| 80\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{\text {c }}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma \\ & \mathbf{n} \\ & \text { O } \end{aligned}$ | $\begin{aligned} & \sum_{n} \\ & \text { io } \\ & \text { in } \end{aligned}$ | $\begin{aligned} & \sum_{<}^{\infty} \\ & \stackrel{i}{\prime} \end{aligned}$ | $\begin{aligned} & \sum_{n} \\ & \underset{\text { N }}{ } \end{aligned}$ | $\begin{aligned} & \underset{<}{\Sigma} \\ & \dot{\infty} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{\prime} \end{aligned}$ | $\begin{aligned} & \underset{0}{\Sigma} \\ & \underset{\sim}{N} \end{aligned}$ | $\underset{\Sigma}{\Sigma}$ $\stackrel{N}{ \pm}$ |
| Major | 1,840 | 1,561 | 1,472 | 1,322 | 1,016 | 919 | 870 | 860 |
| Minor | 979 | 989 | 394 | 647 | 331 | 543 | 453 | 399 |

Existing Volumes





## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level <br> Four Highest <br> Hours | Volumes |  |
| :---: | :---: | :---: |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1 \mathrm{PM}$ | 91 | 31 |
| $3-4 \mathrm{PM}$ | 67 | 34 |
| $4-5 \mathrm{PM}$ | 66 | 32 |
| $4-5 \mathrm{PM}$ | 61 | 28 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| Peak Hour | Volumes |  |
| :---: | :---: | :---: |
|  | Major <br> Street | Pedestrian <br> Total |
|  | 91 | 31 |



* Note: 133 pph applies as the lower threshold volume

Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \Psi \\ & \text { N } \end{aligned}$ | $\begin{aligned} & \underset{\sim}{\Sigma} \\ & \underset{N}{N} \end{aligned}$ | E n N N | $\underset{\substack{\underset{\sim}{i} \\ \underset{N}{2} \\ \hline}}{ }$ | $\begin{aligned} & \underset{i}{\mathbb{4}} \\ & \underset{\sim}{\top} \end{aligned}$ | $\sum$ 4 0 0 0 |
| Major | 767 | 732 | 497 | 441 | 377 | 364 | 345 | 315 |
| Minor | 44 | 32 | 30 | 16 | 9 | 40 | 19 | 16 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{ }$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{\square}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

\begin{tabular}{|c|c|c|c|c|c|c|c|c|}
\hline \multicolumn{9}{|c|}{Eight Highest Hours} <br>
\hline Street \& $\sum$
0
0
8 \& $$
\begin{aligned}
& \Sigma \\
& \underset{0}{2} \\
& 0 \\
& i
\end{aligned}
$$ \& E
N
N \& $\underset{\text { E }}{\text { E }}$ \& $\Sigma$

$\sim$
$N$ \& $\stackrel{\sum}{\underset{\sim}{\infty}}$ \& $\Sigma$
E
N
N \& $\sum$
4
0
0 <br>
\hline Major \& 767 \& 732 \& 497 \& 441 \& 377 \& 364 \& 345 \& 315 <br>
\hline Minor \& 44 \& 32 \& 30 \& 16 \& 9 \& 40 \& 19 \& 16 <br>
\hline
\end{tabular}






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1 \mathrm{PM}$ | 50 | 24 |
| $5-6 \mathrm{PM}$ | 50 | 23 |
| $4-5 \mathrm{PM}$ | 48 | 11 |
| $4-5 \mathrm{PM}$ | 43 | 28 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | ---: |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 50 | 24 |



* Note: 133 pph applies as the lower threshold volume

Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \Sigma \\ & N_{0} \\ & 0 \\ & \dot{N} \end{aligned}$ |  | $\begin{aligned} & \Sigma \\ & \underset{0}{2} \\ & \text { N } \end{aligned}$ | E N N | E N N | $\begin{aligned} & \underset{\leftarrow}{\Sigma} \\ & \underset{\sim}{\top} \\ & \underset{\Gamma}{\top} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \dot{4} \\ & 0 \\ & \infty \end{aligned}$ | $\sum$ $\substack{\infty \\ \sim}$ |
| Major | 1,086 | 942 | 680 | 563 | 473 | 452 | 311 | 309 |
| Minor | 123 | 113 | 143 | 65 | 71 | 68 | 104 | 167 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{\text {c }}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & 0 \\ & i \end{aligned}$ |  | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \underset{M}{J} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{\mathbf{N}} \end{aligned}$ | $\begin{aligned} & \underset{N}{N} \\ & \end{aligned}$ | $\begin{aligned} & \underset{N}{\Sigma} \\ & \underset{N}{\Sigma} \end{aligned}$ | $\begin{aligned} & \underset{<}{\Sigma} \\ & \dot{\infty} \\ & \dot{\infty} \end{aligned}$ | $\stackrel{\sum}{¢}$ |
| Major | 1,086 | 942 | 680 | 563 | 473 | 452 | 311 | 309 |
| Minor | 123 | 113 | 143 | 65 | 71 | 68 | 104 | 167 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $3-4 \mathrm{PM}$ | 142 | 19 |
| $8-9 \mathrm{AM}$ | 52 | 14 |
| $4-5 \mathrm{PM}$ | 34 | 18 |
| $4-5 \mathrm{PM}$ | 30 | 18 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $3-4$ PM | 142 | 19 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \Sigma \\ & \mathbf{n} \\ & 0 \\ & i \end{aligned}$ | $\begin{aligned} & \Sigma_{0}^{2} \\ & \substack{0 \\ \hline} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \underset{N}{\prime} \end{aligned}$ | $\underset{\text { E }}{\text { N }}$ | N $\sim$ $\sim$ $\sim$ | $\begin{aligned} & \underset{i}{\Sigma} \\ & \underset{\sim}{i} \end{aligned}$ | $\underset{\substack{\Sigma \\ \underset{N}{N}}}{ }$ | $\begin{aligned} & \sum \\ & \underset{1}{\infty} \\ & \infty \\ & \infty \end{aligned}$ |
| Major | 776 | 683 | 508 | 370 | 347 | 300 | 223 | 204 |
| Minor | 67 | 44 | 56 | 28 | 26 | 22 | 54 | 27 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma \\ & \mathbf{n} \\ & 0 \\ & i \end{aligned}$ | $\begin{aligned} & \Sigma_{0}^{2} \\ & \substack{0 \\ \hline} \end{aligned}$ | $\sum$ ¢ ¢ N | E N N | N $\sim$ $\sim$ | $\begin{aligned} & \underset{i}{i} \\ & \underset{\sim}{~} \\ & \underset{V}{2} \end{aligned}$ | $\sum$ $\underset{\sim}{\infty}$ $\sim$ | $\sum$ $\substack{\text { a }}$ 0 0 |
| Major | 776 | 683 | 508 | 370 | 347 | 300 | 223 | 204 |
| Minor | 67 | 44 | 56 | 28 | 26 | 22 | 54 | 27 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |  |
| :---: | :---: | :---: |
| Hour Highest <br> Hours | $\|c\|$ <br> Volumes <br> Major <br> Street | Pedestrian <br> Total |
|  | 10 | 8 |
| $12-1 \mathrm{PM}$ | 9 | 7 |
| $3-4 \mathrm{PM}$ | 7 | 4 |
| $3-4 \mathrm{PM}$ | 6 | 12 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $4-5$ PM | 10 | 8 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

| City: County: District | Lincoln | Engineer: Date: | John P Diediker |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | January 13, 2020 |  |
|  |  |  |  |  |
| Major Street: | A St | Lanes: 2 | Major Approach Speed: | 25 |
| Minor Street: | 16th St | Lanes: $\mathbf{3}$ | Minor Approach Speed: | 25 |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| :---: | :---: | :---: |
| 80\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma \\ & \mathbf{n} \\ & 0 \\ & i \end{aligned}$ | $\begin{aligned} & \sum_{0}^{5} \\ & 0 \\ & \$ \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{n} \\ & \underset{\sim}{2} \end{aligned}$ | $\begin{aligned} & \underset{\varangle}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \Sigma_{0} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{4}{0} \\ & 0 \\ & \infty \end{aligned}$ | $\begin{aligned} & \underset{N}{\Sigma} \\ & \underset{\sim}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{\sim}{n} \end{aligned}$ |
| Major | 908 | 877 | 814 | 740 | 607 | 583 | 562 | 533 |
| Minor | 874 | 760 | 606 | 405 | 360 | 339 | 411 | 368 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{ }$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{\square}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \sum_{0}^{\Sigma} \\ & 0 \\ & i \end{aligned}$ |  | $\sum$ <br> 0 | $\sum$ $\substack{\infty \\ \sim \\ \sim}$ | $\begin{aligned} & \Sigma_{N}^{2} \\ & \underset{N}{N} \end{aligned}$ |  | E N N | E N N |
| Major | 908 | 877 | 814 | 740 | 607 | 583 | 562 | 533 |
| Minor | 874 | 760 | 606 | 405 | 360 | 339 | 411 | 368 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $10-11 \mathrm{AM}$ | 13 | 6 |
| $2-3 \mathrm{PM}$ | 13 | 5 |
| $4-5 \mathrm{PM}$ | 11 | 6 |
| $4-5 \mathrm{PM}$ | 10 | 13 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $10-11$ AM | 13 | 6 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

|  | Lincoln | Engineer: Date: | John P Diediker |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | January 13, 2020 |  |
|  |  |  |  |  |
| Major Street: | South St | Lanes: $\mathbf{2}$ | Major Approach Speed: | 25 |
| Minor Street: | 16th St | Lanes: 2 | Minor Approach Speed: | 25 |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and
 inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\sqrt{ }$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & \Sigma \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \sum \\ & \underset{\sim}{\infty} \\ & \underset{N}{\prime} \end{aligned}$ | $\begin{aligned} & \Sigma_{0} \\ & \underset{N}{7} \end{aligned}$ | $\sum$ $<1$ 0 $\infty$ | $\begin{aligned} & \Sigma \\ & \underset{\sim}{\Sigma} \\ & \underset{N}{N} \end{aligned}$ | S N N |  |
| Major | 1,432 | 1,424 | 1,387 | 1,225 | 1,090 | 1,086 | 1,013 | 918 |
| Minor | 788 | 889 | 343 | 563 | 328 | 474 | 453 | 388 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{V}$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| 80\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{V}$ Yes | $\square$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\sum$ 0 0 0 | $\begin{aligned} & \sum_{0}^{2} \\ & 0 \\ & \text { in } \end{aligned}$ | $\sum$ $\substack{\infty \\ N}$ | n ¢ ¢ | $\sum$ 4 0 0 | S ¢ N | N $\sim$ $\sim$ $\sim$ |  |
| Major | 1,432 | 1,424 | 1,387 | 1,225 | 1,090 | 1,086 | 1,013 | 918 |
| Minor | 788 | 889 | 343 | 563 | 328 | 474 | 453 | 388 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |
| :---: | :---: | :---: |
| Four Highest |  |
| Hours |  | | Volumes <br> Street |  | Pedestrian <br> Total |
| :---: | :---: | :---: |
| $4-5 \mathrm{PM}$ |  |  |
| $1-2 \mathrm{PM}$ |  |  |
| $3-4 \mathrm{PM}$ |  |  |
| $3-4 \mathrm{PM}$ |  |  |
| 7 |  |  |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $4-5$ PM | 7 | 11 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

| City: | Lincoln |
| ---: | :--- |
| County |  |
| District: |  |
|  |  |
| Major Street: |  |
| Minor Street: |  |


| Engineer: | John P Diediker |
| ---: | ---: |
| Date: |  |


| Lanes: | $\mathbf{4}$ | Major Approach Speed:$\mathbf{2 5}$ <br> Lanes: <br> $\mathbf{2} \quad$ Minor Approach Speed: <br>  $\mathbf{2 5}$ |
| :--- | :--- | :--- |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population < 10,000?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Warrant 1 is also satisfied if both Condition A and Condition B are "80\%" satisfied
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma \\ & \mathbf{0} \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \Sigma \underset{\sim}{\Sigma} \\ & \underset{N}{N} \end{aligned}$ | $\begin{gathered} \Sigma \\ \underset{0}{5} \\ \underset{\sim}{n} \end{gathered}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \mathbf{N} \end{aligned}$ | $\begin{aligned} & \underset{\sim}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \Sigma \underset{4}{\Sigma} \\ & 0 \\ & \infty \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \mathbf{N} \end{aligned}$ | E n $\sim$ $\sim$ $N$ |
| Major | 560 | 528 | 519 | 517 | 493 | 483 | 423 | 411 |
| Minor | 523 | 448 | 518 | 408 | 614 | 606 | 410 | 368 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\sum$ 0 0 0 | $\begin{aligned} & \underset{\text { N }}{\stackrel{N}{N}} \end{aligned}$ | $\sum$ 0 0 8 | E Q ¢ N | $\sum$ $\underset{\sim}{\infty}$ $\underset{N}{\infty}$ | $\begin{aligned} & \Sigma \\ & \mathbb{4} \\ & 0 \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \underset{\sim}{2} \end{aligned}$ | $\sum$ N N $N$ |
| Major | 560 | 528 | 519 | 517 | 493 | 483 | 423 | 411 |
| Minor | 523 | 448 | 518 | 408 | 614 | 606 | 410 | 368 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $1-2 \mathrm{PM}$ | 133 | 82 |
| $12-1 \mathrm{PM}$ | 131 | 72 |
| $4-5 \mathrm{PM}$ | 122 | 65 |
| $4-5 \mathrm{PM}$ | 115 | 67 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $1-2$ PM | 133 | 82 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and
 inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 80\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\sum$ 0 0 0 | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{Q}{ \pm} \\ & \underset{N}{2} \end{aligned}$ | $\sum$ <br>  <br>  | ¢ ¢ N | E n N N | E N N | $\sum$ <br> 1 <br> 0 <br> 0 |
| Major | 1,738 | 1,619 | 1,551 | 1,469 | 1,460 | 1,437 | 1,396 | 1,363 |
| Minor | 1,111 | 1,041 | 920 | 1,158 | 808 | 722 | 696 | 1,039 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{V}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| 100\% Satisfied: | $\boxed{V}$ Yes | $\square$ No |
| 80\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\sum$ 0 0 0 | $\begin{aligned} & \Sigma \\ & 0 \\ & 0 \\ & 1 \end{aligned}$ | n <br>  <br> N | $\sum$ $\substack{\infty \\ \sim \\ N}$ | E ¢ N | E n O $\sim$ | N $\sim$ $N$ | $\sum$ <br> 1 <br> 0 <br> 0 |
| Major | 1,738 | 1,619 | 1,551 | 1,469 | 1,460 | 1,437 | 1,396 | 1,363 |
| Minor | 1,111 | 1,041 | 920 | 1,158 | 808 | 722 | 696 | 1,039 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $3-4$ PM | 29 | 19 |
| $12-1 \mathrm{PM}$ | 27 | 31 |
| $2-3$ PM | 27 | 28 |
| $2-3$ PM | 25 | 26 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $3-4$ PM | 29 | 19 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

|  | Lincoln | Engineer: Date: | John P Diediker |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | January 14, 2020 |  |
|  |  |  |  |  |
| Major Street: | N 17th St | Lanes: 4 | Major Approach Speed: | 25 |
| Minor Street: | N St | Lanes: $\mathbf{2}$ | Minor Approach Speed: | 25 |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


YesNo

Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfiedYes $\checkmark$ No (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \sum \\ & \underset{1}{\infty} \\ & \infty \\ & \infty \end{aligned}$ | $\begin{aligned} & \underset{\ll}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & \Sigma \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{n}{j} \\ & M \end{aligned}$ | $\begin{aligned} & \underset{\sim}{\Sigma} \\ & \underset{N}{N} \end{aligned}$ | n N N T | S N - |
| Major | 1,332 | 1,330 | 1,327 | 1,313 | 1,094 | 1,022 | 1,012 | 912 |
| Minor | 115 | 113 | 174 | 130 | 127 | 152 | 114 | 111 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma \\ & \mathbb{4} \\ & \mathbf{o} \\ & \infty \end{aligned}$ | $\begin{aligned} & \underset{<}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\sum$ 0 0 8 | $\sum$ 0 0 0 0 | n n ¢ | E ¢ N | E N $\sim$ N | E N N |
| Major | 1,332 | 1,330 | 1,327 | 1,313 | 1,094 | 1,022 | 1,012 | 912 |
| Minor | 115 | 113 | 174 | 130 | 127 | 152 | 114 | 111 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | $\|c\|$ <br> Volumes <br> Street | Pedestrian <br> Total |
|  | 1327 | 56 |
| $8-9$ AM | 1332 | 53 |
| $12-1$ PM | 1012 | 52 |
| $12-1$ PM | 1022 | 42 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $4-5$ PM | 1327 | 56 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

| City: County: District | Lincoln | Engineer: <br> Date: | John P Diediker |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | January 14, 2020 |  |
|  |  |  |  |  |
| Major Street: | S 17th St | Lanes: 4 | Major Approach Speed: | 25 |
| Minor Street: | M St | Lanes: 2 | Minor Approach Speed: | 25 |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


YesNo

Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfiedYes $\checkmark$ No (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition $A$ is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \sum_{\mathbb{K}}^{\infty} \\ & \underset{N}{i} \end{aligned}$ | $\begin{aligned} & \Sigma \underset{1}{\Sigma} \\ & 0 \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & 0 \\ & i \end{aligned}$ | $\sum$ 0 0 8 | $\begin{aligned} & \Sigma \\ & \mathbf{n} \\ & \mathbf{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{i}{N} \\ & \underset{V}{\top} \end{aligned}$ | E N N |
| Major | 1,127 | 1,034 | 873 | 837 | 738 | 716 | 658 | 629 |
| Minor | 114 | 132 | 352 | 391 | 251 | 199 | 217 | 177 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{\varangle}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ |  | $\begin{aligned} & \Sigma \\ & \mathbf{n} \\ & 0 \\ & i \end{aligned}$ | $\sum$ 0 0 0 | E N N N | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{\prime} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | E N N |
| Major | 1,127 | 1,034 | 873 | 837 | 738 | 716 | 658 | 629 |
| Minor | 114 | 132 | 352 | 391 | 251 | 199 | 217 | 177 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |
| :---: | :---: | :---: |
| Four Highest |  |
| Hours |  | | Volumes <br> Street |  | Pedestrian <br> Total |
| :---: | :---: | :---: |
| $4-5 \mathrm{PM}$ |  |  |
| $7-8 \mathrm{AM}$ |  |  |
| $5-6 \mathrm{PM}$ |  |  |
| $5-6 \mathrm{PM}$ |  |  |
| 738 |  |  |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $4-5$ PM | 837 | 58 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and
 inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| :---: | :---: | :---: |
| 80\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \underset{<}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \Sigma \underset{1}{\Sigma} \\ & 0 \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma_{0}^{5} \\ & 00 \\ & 4 \end{aligned}$ | 5 0 0 0 | E N ¢ N | $\begin{aligned} & \Sigma \\ & \underset{N}{\mathbf{N}} \\ & \underset{N}{\prime} \end{aligned}$ | N N N | $\begin{aligned} & \underset{\Sigma}{\Sigma} \\ & \underset{\sim}{\top} \end{aligned}$ |
| Major | 1,883 | 1,451 | 1,106 | 1,087 | 992 | 867 | 809 | 722 |
| Minor | 1,143 | 961 | 841 | 877 | 748 | 697 | 612 | 623 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{V}$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\square$ No |
| 80\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| $70 \%$ Satisfied: | $\boxed{ }$ Yes | $\square$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{<}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{4}{4} \\ & 0 \\ & \infty \end{aligned}$ | $\sum$ 0 0 0 | $\sum$ 0 0 0 0 | E N N | $\sum$ $\underset{N}{\text { N }}$ N | N $\sim$ $\sim$ | $\sum$ $\underset{\sim}{\Sigma}$ $\stackrel{N}{\top}$ |
| Major | 1,883 | 1,451 | 1,106 | 1,087 | 992 | 867 | 809 | 722 |
| Minor | 1,143 | 961 | 841 | 877 | 748 | 697 | 612 | 623 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1 \mathrm{PM}$ | 60 | 18 |
| $8-9 \mathrm{AM}$ | 44 | 18 |
| $3-4 \mathrm{PM}$ | 39 | 28 |
| $3-4 \mathrm{PM}$ | 35 | 22 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 60 | 18 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and
 inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 80\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | 5 0 0 0 | $\begin{aligned} & \Sigma \\ & \underset{0}{0} \\ & \dot{1} \end{aligned}$ | $\underset{\substack{\infty \\ \underset{N}{\infty} \\ \hline}}{ }$ | $\sum$ 0 $\pm$ | n N - | $\begin{aligned} & \Sigma \\ & \underset{1}{2} \\ & \hline \infty \\ & \infty \end{aligned}$ | E N N | $\begin{aligned} & \Sigma \\ & \underset{K}{K} \\ & \underset{~ N}{V} \end{aligned}$ |
| Major | 2,046 | 1,784 | 1,449 | 1,396 | 1,137 | 1,081 | 982 | 837 |
| Minor | 567 | 575 | 966 | 537 | 462 | 776 | 501 | 432 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{V}$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\square$ No |
| 80\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| $70 \%$ Satisfied: | $\boxed{ }$ Yes | $\square$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\sum$ 0 0 0 | $\begin{aligned} & \Sigma \\ & n_{0} \\ & 0 \\ & \dot{N} \end{aligned}$ | $\sum$ $\substack{\text { a }}$ $N$ | n n ¢ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{n} \end{aligned}$ | $$ | E ¢ N |  |
| Major | 2,046 | 1,784 | 1,449 | 1,396 | 1,137 | 1,081 | 982 | 837 |
| Minor | 567 | 575 | 966 | 537 | 462 | 776 | 501 | 432 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1 \mathrm{PM}$ | 57 | 25 |
| $7-8 \mathrm{AM}$ | 53 | 34 |
| $5-6 \mathrm{PM}$ | 51 | 39 |
| $5-6 \mathrm{PM}$ | 47 | 25 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | ---: |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| Peak Hour | Volumes |  |
| :---: | :---: | :---: |
|  | Major <br> Street | Pedestrian <br> Total |
|  | 57 | 25 |



* Note: 133 pph applies as the lower threshold volume

Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

|  | Lincoln | Engineer: Date: | John P Diediker |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | January 15, 2020 |  |
|  |  |  |  |  |
| Major Street: | 17th St | Lanes: 4 | Major Approach Speed: | 25 |
| Minor Street: | J St | Lanes: 1 | Minor Approach Speed: | 25 |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \underset{\varangle}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \sum \\ & \dot{k} \\ & \infty \\ & \infty \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \begin{array}{l} n \\ 0 \\ \text { O } \end{array} \end{aligned}$ | E N N N | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & 0 \\ & i \end{aligned}$ | $\begin{aligned} & \underset{\sim}{\Sigma} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \underset{i}{\mathbb{4}} \\ & \underset{\sim}{\top} \end{aligned}$ | $\Sigma$ N N $N$ |
| Major | 1,127 | 851 | 691 | 664 | 641 | 574 | 511 | 488 |
| Minor | 94 | 59 | 53 | 79 | 54 | 40 | 32 | 35 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{<}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \sum \\ & \underset{1}{0} \\ & \infty \\ & \infty \end{aligned}$ | $\sum$ 0 0 $i$ | $\begin{aligned} & \Sigma \\ & \underset{0}{\top} \\ & \underset{N}{2} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \sum_{0} \\ & 0 \\ & i \end{aligned}$ | E N N | $\begin{aligned} & \Sigma \\ & \underset{\leftarrow}{\Sigma} \\ & \underset{i}{\top} \end{aligned}$ | E N N N |
| Major | 1,127 | 851 | 691 | 664 | 641 | 574 | 511 | 488 |
| Minor | 94 | 59 | 53 | 79 | 54 | 40 | 32 | 35 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level <br> Hours Highest <br> Hour\| |  | $\|c\|$ <br> Molumes <br> Street |
| :---: | :---: | :---: |
| 7-8 AM | Pedestrian <br> Total |  |
| $5-6 \mathrm{PM}$ | 25 | 24 |
| $3-4 \mathrm{PM}$ | 25 | 21 |
| $3-4 \mathrm{PM}$ | 25 | 11 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $7-8 \mathrm{AM}$ | 30 | 24 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\underset{\substack{\infty \\ \underset{N}{\infty} \\ \hline}}{ }$ | $\begin{aligned} & \sum \\ & \underset{1}{k} \\ & \infty \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{n}{2} \\ & 0 \\ & i \end{aligned}$ |  | 5 0 0 0 | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \underset{\sim}{N} \end{aligned}$ | $\begin{aligned} & \underset{i}{\Sigma} \\ & \underset{i}{N} \end{aligned}$ |
| Major | 1,188 | 913 | 725 | 664 | 635 | 615 | 578 | 480 |
| Minor | 206 | 113 | 161 | 193 | 118 | 99 | 93 | 70 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{\text {c }}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\underset{\substack{\infty \\ \underset{N}{i}}}{ }$ | $\begin{aligned} & \Sigma \\ & \underset{6}{8} \\ & \dot{\infty} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \mathbf{0} \\ & \text { in } \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \vdots \\ & \ddagger \\ & \hline \end{aligned}$ | $$ | $\begin{aligned} & \sum_{0}^{N} \\ & \underset{\sim}{N} \end{aligned}$ | $\begin{aligned} & \underset{0}{\Sigma} \\ & \underset{\sim}{N} \end{aligned}$ | $\underset{\Sigma}{\Sigma}$ $\underset{\sim}{\Sigma}$ $\underset{\sim}{L}$ |
| Major | 1,188 | 913 | 725 | 664 | 635 | 615 | 578 | 480 |
| Minor | 206 | 113 | 161 | 193 | 118 | 99 | 93 | 70 |

Existing Volumes





## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $3-4 \mathrm{PM}$ | 115 | 35 |
| $8-9 \mathrm{AM}$ | 53 | 30 |
| $7-8 \mathrm{AM}$ | 45 | 12 |
| $7-8 \mathrm{AM}$ | 33 | 10 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $3-4$ PM | 115 | 35 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \underset{\varangle}{\Sigma} \\ & \underset{N}{\infty} \end{aligned}$ | $\begin{aligned} & \sum \\ & \mathbb{\varangle} \\ & 0 \\ & \infty \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & 0 \\ & 0 \end{aligned}$ | $\sum$ 0 0 8 |  | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \underset{\sim}{2} \end{aligned}$ | E N N - |
| Major | 994 | 681 | 532 | 513 | 457 | 453 | 423 | 385 |
| Minor | 91 | 46 | 78 | 42 | 55 | 33 | 27 | 29 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\underset{\substack{\infty \\ \underset{N}{i} \\ \hline}}{ }$ | $\begin{aligned} & \Sigma \\ & \underset{\alpha}{4} \\ & 0 \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{n} \\ & 0 \\ & i \end{aligned}$ | $\sum$ 0 0 $i$ | ® Q ¢ | E N N | N N N |  |
| Major | 994 | 681 | 532 | 513 | 457 | 453 | 423 | 385 |
| Minor | 91 | 46 | 78 | 42 | 55 | 33 | 27 | 29 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $4-5 \mathrm{PM}$ | 14 | 23 |
| $5-6 \mathrm{PM}$ | 10 | 21 |
| $1-2 \mathrm{PM}$ | 6 | 9 |
| $1-2 \mathrm{PM}$ | 5 | 11 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $4-5$ PM | 14 | 23 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
 (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | :--- | :--- |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| $70 \%$ Satisfied: | $\boxed{ }$ Yes | $\square$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & 0 \\ & 0 \end{aligned}$ |  | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \underset{N}{\prime} \end{aligned}$ | $\sum$ $\substack{\infty \\ N}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \Gamma \end{aligned}$ | $\begin{aligned} & \sum \\ & \dot{4} \\ & 0 \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma_{\mathrm{N}} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \sum \\ & \underset{~}{\Sigma} \\ & \underset{\Sigma}{\Sigma} \end{aligned}$ |
| Major | 865 | 793 | 734 | 707 | 563 | 525 | 517 | 465 |
| Minor | 601 | 631 | 674 | 1,037 | 529 | 777 | 510 | 418 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\square$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{ }$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

\begin{tabular}{|c|c|c|c|c|c|c|c|c|}
\hline \multicolumn{9}{|c|}{Eight Highest Hours} <br>
\hline Street \& $$
\begin{aligned}
& \Sigma \\
& \mathbf{0} \\
& \mathbf{0} \\
& \dot{i}
\end{aligned}
$$ \& $$
\begin{aligned}
& \Sigma \\
& \underset{0}{5} \\
& \underset{\sim}{n}
\end{aligned}
$$ \& E
N
N \& $\sum$
$\substack{\infty \\ \sim}$ \& S

N \&  \& $\sum$
N
N \& $\sum$
$\underset{\sim}{\Sigma}$
$\stackrel{N}{\top}$ <br>
\hline Major \& 865 \& 793 \& 734 \& 707 \& 563 \& 525 \& 517 \& 465 <br>
\hline Minor \& 601 \& 631 \& 674 \& 1,037 \& 529 \& 777 \& 510 \& 418 <br>
\hline
\end{tabular}






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1 \mathrm{PM}$ | 32 | 13 |
| $4-5 \mathrm{PM}$ | 32 | 13 |
| $1-2 \mathrm{PM}$ | 32 | 4 |
| $1-2 \mathrm{PM}$ | 28 | 9 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 32 | 13 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.


Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| ---: | ---: | :---: |
| 80\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| 70\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Street | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\sum$ $\underset{\sim}{\infty}$ $\underset{N}{\infty}$ | $\begin{aligned} & \underset{<}{\Sigma} \\ & \hline \mathbf{\infty} \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{n} \\ & 0 \\ & i \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \mathbf{N} \\ & \underset{N}{2} \end{aligned}$ | $$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{\sim}{N} \\ & \underset{\sim}{2} \end{aligned}$ | $\sum_{0}$ N N |
| Major | 964 | 680 | 572 | 557 | 552 | 438 | 421 | 386 |
| Minor | 63 | 75 | 120 | 84 | 102 | 68 | 84 | 102 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{ }$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 100\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| 80\% Satisfied: | $\square$ Yes | $\boxed{ }$ No |
| $70 \%$ Satisfied: | $\square$ Yes | $\boxed{\square}$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \underset{<}{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | $\sum$ $\$$ 0 $\infty$ | E 0 0 0 | E O ¢ | E 0 0 + | $\underset{\text { E }}{\text { E }}$ | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{n} \end{aligned}$ | $\sum$ N N $N$ |
| Major | 964 | 680 | 572 | 557 | 552 | 438 | 421 | 386 |
| Minor | 63 | 75 | 120 | 84 | 102 | 68 | 84 | 102 |






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |  |
| :---: | :---: | :---: |
| Hour Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $4-5 \mathrm{PM}$ | 21 | 15 |
| $2-3 \mathrm{PM}$ | 17 | 8 |
| $5-6 \mathrm{PM}$ | 15 | 11 |
| $5-6 \mathrm{PM}$ | 13 | 14 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $4-5$ PM | 21 | 15 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

|  | Lincoln | Engineer: Date: | John P Diediker |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | January 15, 2020 |  |
|  |  |  |  |  |
| Major Street: | South St | Lanes: $\mathbf{2}$ | Major Approach Speed: | 25 |
| Minor Street: | 17th St | Lanes: 2 | Minor Approach Speed: | 25 |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and
 inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 80\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma \\ & \Sigma_{0} \\ & 0 \\ & \stackrel{1}{n} \end{aligned}$ | $$ | $\begin{aligned} & \Sigma \\ & \underset{n}{\Sigma} \\ & \text { ल } \end{aligned}$ | $\sum$ $\substack{\infty \\ N}$ | E ¢ N | $\begin{aligned} & \Sigma \\ & \underset{N}{N} \\ & \underset{N}{n} \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{4}{4} \\ & 0 \\ & \infty \end{aligned}$ | $\sum$ ¢ N ¢ |
| Major | 2,183 | 2,038 | 1,694 | 1,551 | 1,280 | 1,258 | 1,247 | 1,177 |
| Minor | 386 | 444 | 376 | 723 | 249 | 244 | 425 | 213 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{V}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| 100\% Satisfied: | $\boxed{V}$ Yes | $\square$ No |
| 80\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\sum$ 0 0 0 10 | $\begin{aligned} & \sum_{0}^{5} \\ & 0 \\ & \hline \end{aligned}$ | n Q ¢ | $\sum$ $\substack{\text { a }}$ $N$ |  | E N N | $\begin{aligned} & \Sigma \\ & \underset{K}{4} \\ & \mathbf{0} \\ & \infty \end{aligned}$ |  |
| Major | 2,183 | 2,038 | 1,694 | 1,551 | 1,280 | 1,258 | 1,247 | 1,177 |
| Minor | 386 | 444 | 376 | 723 | 249 | 244 | 425 | 213 |

## Existing Volumes






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| 100\% Volume Level |  |  |
| :---: | :---: | :---: |
| Four Highest <br> Hours | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $5-6$ PM | 24 | 8 |
| $3-4 \mathrm{PM}$ | 21 | 13 |
| $12-1 \mathrm{PM}$ | 13 | 5 |
| $12-1 \mathrm{PM}$ | 12 | 4 |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $5-6$ PM | 24 | 8 |



* Note: 133 pph applies as the lower threshold volume

Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY


MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and
 inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |
| :---: | :---: | :---: |
| 80\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\begin{aligned} & \Sigma \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & \Sigma \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \sum_{n}^{\infty} \\ & \underset{N}{\infty} \end{aligned}$ | n N M | $\sum$ $<1$ 0 0 | E N N | $\sum_{n}$ n N | E N N |
| Major | 2,370 | 2,340 | 2,024 | 1,949 | 1,762 | 1,546 | 1,506 | 1,371 |
| Minor | 298 | 307 | 263 | 253 | 235 | 214 | 190 | 224 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{V}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| 100\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| 80\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| $70 \%$ Satisfied: | $\boxed{ }$ Yes | $\square$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | 5 0 0 0 | $\begin{aligned} & \sum_{0}^{\Sigma} \\ & \varphi \\ & \dot{N} \end{aligned}$ | n $\sim$ $\sim$ | n n ¢ | $\begin{aligned} & \sum \\ & \dot{4} \\ & 0 \\ & \infty \end{aligned}$ | E ¢ N | $\begin{aligned} & \Sigma \\ & \Sigma_{0} \\ & \underset{N}{N} \end{aligned}$ | n N N |
| Major | 2,370 | 2,340 | 2,024 | 1,949 | 1,762 | 1,546 | 1,506 | 1,371 |
| Minor | 298 | 307 | 263 | 253 | 235 | 214 | 190 | 224 |

## Existing Volumes






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| Four Highest Hours | Volumes |  |
| :---: | :---: | :---: |
|  | Major Street | Pedestrian Total |
| 12-1 PM | 45 |  |
| 5-6 PM | 41 |  |
| 4-5 PM | 39 |  |
| 4-5 PM | 35 |  |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $12-1$ PM | 45 |  |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

TRAFFIC SIGNAL WARRANT SUMMARY

|  | Lincoln | Engineer: <br> Date: | John P Diediker |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | January 10, 2020 |  |
|  |  |  |  |  |
| Major Street: | Antelope Valley Pkwy | Lanes: 3 | Major Approach Speed: | 35 |
| Minor Street: | P St | Lanes: 3 | Minor Approach Speed: | 25 |

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

## Volume Level Criteria

1. Is the posted speed or 85 th-percentile of major street $>40 \mathrm{mph}(70 \mathrm{~km} / \mathrm{h})$ ?
2. Is the intersection in a built-up area of an isolated community with a population $<10,000$ ?

" $70 \%$ " volume level may be used if Question 1 or 2 above is answered "Yes"


## WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100\%" satisfied for eight hours.
Warrant 1 is also satisfied if both Condition A and Condition B are " $80 \%$ " satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and
 inconvenience to traffic has failed to solve the traffic problems).

## Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

| 100\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :---: | :---: |
| 80\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |
| 70\% Satisfied: | $\boxed{\checkmark}$ Yes | $\square$ No |


| Number of Lanes for moving <br> traffic on each approach | Vehicles per hour on major- <br> street (total of both <br> approaches) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | $\mathbf{1 0 0 \% ^ { \text { a } }}$ | Vehicles per hour on minor- <br> street (one direction only) |  |  |  |  |
| 1 | 1 | 500 | 400 | 350 | 150 | 120 | 105 |
| 2 or more | 1 | 600 | 480 | 420 | 150 | 120 | 105 |
| 2 or more | 2 or more | 600 | 480 | 420 | 200 | 160 | 140 |
| 1 | 2 or more | 500 | 400 | 350 | 200 | 160 | 140 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{\mathrm{b}}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

|  | Eight Highest Hours |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | 5 0 0 0 | $\begin{aligned} & \sum_{0} \\ & 0 \\ & i \end{aligned}$ | $\underset{\substack{\mathbb{C}}}{\underset{\sim}{\infty}}$ | $\begin{aligned} & \Sigma \\ & \text { n } \\ & \text { M } \end{aligned}$ | $\begin{aligned} & \sum \\ & \dot{4} \\ & 0 \\ & \infty \end{aligned}$ | $\begin{aligned} & \Sigma \\ & \underset{\sim}{2} \\ & \underset{N}{N} \end{aligned}$ | n ¢ N | $\sum$ <br> $i$ <br> $i$ <br> $i$ |
| Major | 1,920 | 1,895 | 1,725 | 1,573 | 1,430 | 1,205 | 1,100 | 1,021 |
| Minor | 737 | 685 | 309 | 514 | 263 | 420 | 427 | 273 |

## Existing Volumes

## TRAFFIC SIGNAL WARRANT SUMMARY

## Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

| Applicable: | $\boxed{V}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| 100\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| 80\% Satisfied: | $\boxed{ }$ Yes | $\square$ No |
| $70 \%$ Satisfied: | $\boxed{ }$ Yes | $\square$ No |


| Number of traffic on | for moving approach | Vehicles per hour on majorstreet (total of both approaches) |  |  | Vehicles per hour on minorstreet (one direction only) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Major | Minor | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ | 100\% ${ }^{\text {a }}$ | 80\% ${ }^{\text {b }}$ | 70\% ${ }^{\text {c }}$ |
| 1 | 1 | 750 | 600 | 525 | 75 | 60 | 53 |
| 2 or more | 1 | 900 | 720 | 630 | 75 | 60 | 53 |
| 2 or more | 2 or more | 900 | 720 | 630 | 100 | 80 | 70 |
| 1 | 2 or more | 750 | 600 | 525 | 100 | 80 | 70 |

${ }^{\text {a }}$ Basic Minimum hourly volume
${ }^{b}$ Used for combination of Conditions $A$ and $B$ after adequate trial of other remedial measures
${ }^{c}$ May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

| Eight Highest Hours |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | $\sum$ 0 0 0 | $\begin{aligned} & \sum_{0}^{2} \\ & 0 \\ & \text { in } \end{aligned}$ | $\sum$ $\substack{\infty \\ \sim}$ | n n ¢ | $\begin{aligned} & \sum \\ & \dot{4} \\ & 0 \\ & \infty \end{aligned}$ | n 0 $\sim$ $N$ | n ¢ N | $\sum$ <br> $i$ <br> $i$ |
| Major | 1,920 | 1,895 | 1,725 | 1,573 | 1,430 | 1,205 | 1,100 | 1,021 |
| Minor | 737 | 685 | 309 | 514 | 263 | 420 | 427 | 273 |

## Existing Volumes






## WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.


Plot four volume combinations on the applicable figure below.
Figure 4C-5. Criteria for "100\%" Volume Level

| $\mathbf{1 0 0 \%}$ Volume Level |  |
| :---: | :---: | :---: |
| Four Highest |  |
| Hours |  | | Volumes <br> Major <br> Street |  | Pedestrian <br> Total |
| :---: | :---: | :---: |
| $7-8 \mathrm{AM}$ |  |  |
| $4-5 \mathrm{PM}$ |  |  |
| $3-4 \mathrm{PM}$ |  |  |
| $3-4 \mathrm{PM}$ |  |  |
| 29 |  |  |



* Note: 107 pph applies as the lower threshold volume

Figure 4C-6 Criteria for "70\%" Volume Level


* Note: 75 pph applies as the lower threshold volume


## WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

| Applicable: | $\boxed{\checkmark}$ Yes | $\square$ No |
| ---: | :--- | :--- |
| Satisfied: | $\square$ Yes | $\boxed{\checkmark}$ No |

Plot one volume combination on the applicable figure below.

| $100 \%$ Volume Level |  |  |
| :---: | :---: | :---: |
|  | Volumes |  |
|  | Major <br> Street | Pedestrian <br> Total |
| $7-8 \mathrm{AM}$ | 35 | 3 |

Figure 4C-7. Criteria for "100\%" Volume Level - Peak Hour


* Note: 133 pph applies as the lower threshold volume

70\% Volume Level


Figure 4C-8 Criteria for "70\%" Volume Level - Peak Hour


* Note: 93 pph applies as the lower threshold volume

