



# MINNESOTA DEPARTMENT OF TRANSPORTATION

## METRO DIVISION - TRAFFIC ENGINEERING

### SIGNAL WARRANTS ANALYSIS

LOCATION: TH-19 & COLUMBUS AVE.

COUNTY: SCOTT

REF. POINT: 151.360

DATE: 3/23/1999

OPERATOR: DT

| Speed | Approach Description                     | Lanes |
|-------|--|-------|
| 30    | Major App1: TH-19 EB, W OF COLUMBUS AVE. | 1     |
| 30    | Major App3: TH-19 WB, E OF COLUMBUS AVE. | 1     |
| 30    | Minor App2: COLUMBUS AVE. NB, S OF TH-19 | 1     |
| 30    | Minor App4: COLUMBUS AVE. SB, N OF TH-19 | 1     |

0.70 FACTOR USED? NO

POPULATION < 10,000? NO

EXISTING SIGNAL ? NO

| HOUR          | 500/750      |              |           |             | 150/75       |              | 150/75             |                    | MET SAME HOURS |
|---------------|--------------|--------------|-----------|-------------|--------------|--------------|--------------------|--------------------|----------------|
|               | MAJOR APP. 1 | MAJOR APP. 3 | TOTAL 1+3 | WARRANT MET | MINOR APP. 2 | MINOR APP. 4 | WARRANT MET APP. 2 | WARRANT MET APP. 4 |                |
| 0:00 - 1:00   | 22           | 17           | 39        | /           | 2            | 2            | /                  | /                  | /              |
| 1:00 - 2:00   | 13           | 9            | 22        | /           | 0            | 1            | /                  | /                  | /              |
| 2:00 - 3:00   | 4            | 12           | 16        | /           | 0            | 3            | /                  | /                  | /              |
| 3:00 - 4:00   | 9            | 8            | 17        | /           | 2            | 0            | /                  | /                  | /              |
| 4:00 - 5:00   | 30           | 17           | 47        | /           | 2            | 2            | /                  | /                  | /              |
| 5:00 - 6:00   | 110          | 70           | 180       | /           | 5            | 8            | /                  | /                  | /              |
| 6:00 - 7:00   | 208          | 140          | 348       | /           | 27           | 20           | /                  | /                  | /              |
| 7:00 - 8:00   | 307          | 273          | 580       | X/          | 32           | 126          | /                  | /X                 | /              |
| 8:00 - 9:00   | 326          | 268          | 594       | X/          | 15           | 37           | /                  | /                  | /              |
| 9:00 - 10:00  | 292          | 270          | 562       | X/          | 15           | 56           | /                  | /                  | /              |
| 10:00 - 11:00 | 266          | 253          | 519       | X/          | 10           | 48           | /                  | /                  | /              |
| 11:00 - 12:00 | 300          | 273          | 573       | X/          | 19           | 58           | /                  | /                  | /              |
| 12:00 - 13:00 | 323          | 299          | 622       | X/          | 17           | 58           | /                  | /                  | /              |
| 13:00 - 14:00 | 336          | 316          | 652       | X/          | 18           | 62           | /                  | /                  | /              |
| 14:00 - 15:00 | 405          | 380          | 785       | X/X         | 25           | 134          | /                  | /X                 | /X             |
| 15:00 - 16:00 | 432          | 435          | 867       | X/X         | 23           | 106          | /                  | /X                 | /X             |
| 16:00 - 17:00 | 444          | 434          | 878       | X/X         | 33           | 103          | /                  | /X                 | /X             |
| 17:00 - 18:00 | 449          | 424          | 873       | X/X         | 30           | 72           | /                  | /                  | /              |
| 18:00 - 19:00 | 297          | 339          | 636       | X/          | 27           | 53           | /                  | /                  | /              |
| 19:00 - 20:00 | 242          | 226          | 468       | /           | 19           | 57           | /                  | /                  | /              |
| 20:00 - 21:00 | 184          | 195          | 379       | /           | 12           | 60           | /                  | /                  | /              |
| 21:00 - 22:00 | 126          | 115          | 241       | /           | 7            | 19           | /                  | /                  | /              |
| 22:00 - 23:00 | 83           | 58           | 141       | /           | 7            | 12           | /                  | /                  | /              |
| 23:00 - 24:00 | 37           | 32           | 69        | /           | 1            | 7            | /                  | /                  | /              |

|            | Met (Hr) | Required (Hr) |               |
|------------|----------|---------------|---------------|
| Warrant 1  | 0        | 8             | Not satisfied |
| Warrant 2  | 3        | 8             | Not satisfied |
| Warrant 6  | 6        | 8             | Not satisfied |
| Warrant 8  | 1        | 8             | Not satisfied |
| Warrant 9  | 0        | 4             | Not satisfied |
| Warrant 11 | 0        | 1             | Not satisfied |

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COUNTY: SCOTT

REF. POINT: 151.360

DATE: 3/23/1999

OPERATOR: DT

0.70 FACTOR USED? NO  
 POPULATION < 10,000? NO  
 EXISTING SIGNAL ? NO

| Speed | Approach Description                     | Lanes |
|-------|--|-------|
| 30    | Major App1: TH-19 EB, W OF COLUMBUS AVE. | 1     |
| 30    | Major App3: TH-19 WB, E OF COLUMBUS AVE. | 1     |
| 30    | Minor App2: COLUMBUS AVE. NB, S OF TH-19 | 1     |
| 30    | Minor App4: COLUMBUS AVE. SB, N OF TH-19 | 1     |

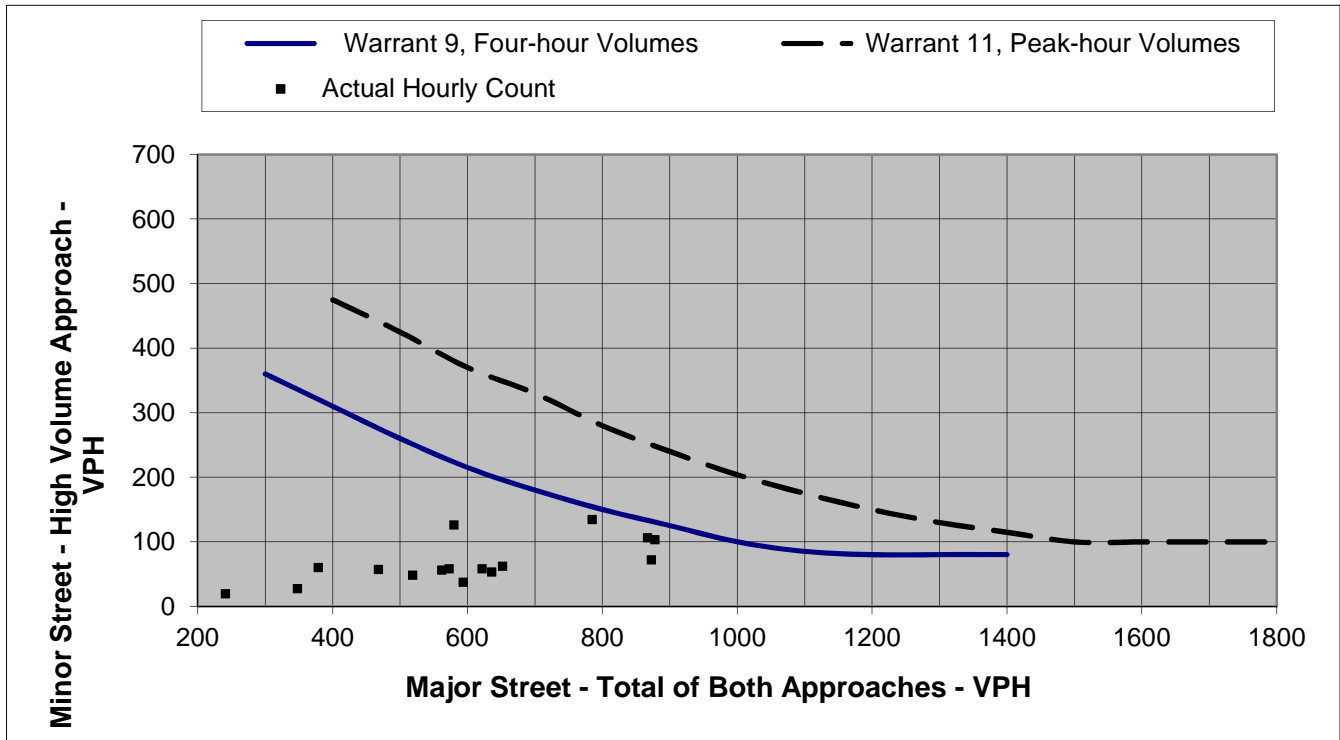


Figure 1. Four Hour and Peak Hour Warrant Analysis

Note: For data points outside the graph range, check the minor street volume against the lower thresholds

| Major | Warrant Criteria |               | Actual Hourly Count |                     |
|-------|------------------|---------------|---------------------|---------------------|
|       | Warrant 9, F     | Warrant 11, P | Major               | Actual Hourly Count |
| 200   |                  |               | 39                  | 2                   |
| 300   | 360              |               | 22                  | 1                   |
| 400   | 310              | 475           | 16                  | 3                   |
| 500   | 260              | 425           | 17                  | 2                   |
| 600   | 215              | 370           | 47                  | 2                   |
| 700   | 180              | 330           | 180                 | 8                   |
| 800   | 150              | 280           | 348                 | 27                  |
| 900   | 125              | 240           | 580                 | 126                 |
| 1000  | 100              | 204           | 594                 | 37                  |
| 1100  | 85               | 175           | 562                 | 56                  |
| 1200  | 80               | 150           | 519                 | 48                  |
| 1300  | 80               | 130           | 573                 | 58                  |
| 1400  | 80               | 115           | 622                 | 58                  |
| 1500  |                  | 100           | 652                 | 62                  |
| 1600  |                  | 100           | 785                 | 134                 |
| 1700  |                  | 100           | 867                 | 106                 |
| 1800  |                  | 100           | 878                 | 103                 |
|       |                  |               | 873                 | 72                  |
|       |                  |               | 636                 | 53                  |
|       |                  |               | 468                 | 57                  |
|       |                  |               | 379                 | 60                  |
|       |                  |               | 241                 | 19                  |
|       |                  |               | 141                 | 12                  |
|       |                  |               | 69                  | 7                   |

Four Hour Warrant

| Major App | Minor App |       |       |
|-----------|-----------|-------|-------|
|           | 1 & 1     | 2 & 1 | 2 & 2 |
| 300       | 360       | 440   | 590   |
| 400       | 310       | 390   | 530   |
| 500       | 260       | 340   | 460   |
| 600       | 215       | 290   | 390   |
| 700       | 180       | 245   | 330   |
| 800       | 150       | 205   | 280   |
| 900       | 125       | 170   | 235   |
| 1000      | 100       | 145   | 195   |
| 1100      | 85        | 120   | 165   |
| 1200      | 80        | 100   | 135   |
| 1300      | 80        | 83    | 110   |
| 1400      | 80        | 80    | 110   |

Peak Hour

| Major App | 1 & 1 |
|-----------|-------|
| 400       | 475   |
| 500       | 425   |
| 600       | 370   |
| 700       | 330   |
| 800       | 280   |
| 900       | 240   |
| 1000      | 204   |
| 1100      | 175   |
| 1200      | 150   |
| 1300      | 130   |
| 1400      | 115   |
| 1500      | 100   |
| 1600      | 100   |
| 1700      | 100   |
| 1800      | 100   |

Four Hour Warrant Factored

| Major App | Minor App |       |       |
|-----------|-----------|-------|-------|
|           | 1 & 1     | 2 & 1 | 2 & 2 |
| 200       | 250       | 320   | 420   |
| 300       | 210       | 265   | 350   |
| 400       | 170       | 215   | 285   |
| 500       | 130       | 170   | 230   |
| 600       | 93        | 130   | 175   |
| 700       | 70        | 100   | 135   |
| 800       | 60        | 80    | 103   |
| 900       | 60        | 65    | 80    |
| 1000      | 60        | 60    | 80    |

Peak Hour

| Major App | 1 & 1 |
|-----------|-------|
| 300       | 320   |
| 400       | 270   |
| 500       | 225   |
| 600       | 180   |
| 700       | 145   |
| 800       | 115   |
| 900       | 90    |
| 1000      | 75    |
| 1100      | 75    |
| 1200      | 75    |
| 1300      | 75    |



Warrant

Minor App

| 2 & 1 | 2 & 2 |
|-------|-------|
| 570   | 725   |
| 520   | 665   |
| 465   | 600   |
| 420   | 540   |
| 370   | 480   |
| 330   | 425   |
| 285   | 375   |
| 250   | 330   |
| 220   | 285   |
| 190   | 250   |
| 160   | 220   |
| 140   | 187   |
| 115   | 165   |
| 100   | 150   |
| 100   | 150   |

Warrant Factored

Minor App

| 2 & 1 | 2 & 2 |
|-------|-------|
| 380   | 500   |
| 335   | 435   |
| 285   | 370   |
| 240   | 315   |
| 200   | 260   |
| 160   | 215   |
| 135   | 175   |
| 110   | 140   |
| 95    | 115   |
| 75    | 100   |
| 75    | 100   |



# MINNESOTA DEPARTMENT OF TRANSPORTATION

## METRO DIVISION - TRAFFIC ENGINEERING

### ALL WAY STOP WARRANT

LOCATION: TH-19 & COLUMBUS AVE.

COUNTY: SCOTT

REF. POINT: 151.360

DATE: 3/23/1999

OPERATOR: DT

| Speed | Approach Description                     | Lanes |
|-------|--|-------|
| 30    | Major App1: TH-19 EB, W OF COLUMBUS AVE. | 1     |
| 30    | Major App3: TH-19 WB, E OF COLUMBUS AVE. | 1     |
| 30    | Minor App2: COLUMBUS AVE. NB, S OF TH-19 | 1     |
| 30    | Minor App4: COLUMBUS AVE. SB, N OF TH-19 | 1     |

0.70 FACTOR USED? No

| HOUR          | MAJOR APP. 1 | MAJOR APP. 3 | MINOR APP. 2 | MINOR APP. 4 | 500                          | 200                            | WARRANT MET |
|---------------|--------------|--------------|--------------|--------------|------------------------------|--------------------------------|-------------|
|               |              |              |              |              | TOTAL<br>Σ (APP.1 to APP. 4) | MINOR TOTAL<br>APP. 2 + APP. 4 |             |
| 0:00 - 1:00   | 22           | 17           | 2            | 2            | 43                           | 4                              | /           |
| 1:00 - 2:00   | 13           | 9            | 0            | 1            | 23                           | 1                              | /           |
| 2:00 - 3:00   | 4            | 12           | 0            | 3            | 19                           | 3                              | /           |
| 3:00 - 4:00   | 9            | 8            | 2            | 0            | 19                           | 2                              | /           |
| 4:00 - 5:00   | 30           | 17           | 2            | 2            | 51                           | 4                              | /           |
| 5:00 - 6:00   | 110          | 70           | 5            | 8            | 193                          | 13                             | /           |
| 6:00 - 7:00   | 208          | 140          | 27           | 20           | 395                          | 47                             | /           |
| 7:00 - 8:00   | 307          | 273          | 32           | 126          | 738                          | 158                            | X/          |
| 8:00 - 9:00   | 326          | 268          | 15           | 37           | 646                          | 52                             | X/          |
| 9:00 - 10:00  | 292          | 270          | 15           | 56           | 633                          | 71                             | X/          |
| 10:00 - 11:00 | 266          | 253          | 10           | 48           | 577                          | 58                             | X/          |
| 11:00 - 12:00 | 300          | 273          | 19           | 58           | 650                          | 77                             | X/          |
| 12:00 - 13:00 | 323          | 299          | 17           | 58           | 697                          | 75                             | X/          |
| 13:00 - 14:00 | 336          | 316          | 18           | 62           | 732                          | 80                             | X/          |
| 14:00 - 15:00 | 405          | 380          | 25           | 134          | 944                          | 159                            | X/          |
| 15:00 - 16:00 | 432          | 435          | 23           | 106          | 996                          | 129                            | X/          |
| 16:00 - 17:00 | 444          | 434          | 33           | 103          | 1014                         | 136                            | X/          |
| 17:00 - 18:00 | 449          | 424          | 30           | 72           | 975                          | 102                            | X/          |
| 18:00 - 19:00 | 297          | 339          | 27           | 53           | 716                          | 80                             | X/          |
| 19:00 - 20:00 | 242          | 226          | 19           | 57           | 544                          | 76                             | X/          |
| 20:00 - 21:00 | 184          | 195          | 12           | 60           | 451                          | 72                             | /           |
| 21:00 - 22:00 | 126          | 115          | 7            | 19           | 267                          | 26                             | /           |
| 22:00 - 23:00 | 83           | 58           | 7            | 12           | 160                          | 19                             | /           |
| 23:00 - 24:00 | 37           | 32           | 1            | 7            | 77                           | 8                              | /           |

Met (Hr) Required (Hr)

Allway Stop Warrant: 0 8 Not satisfied

REMARKS: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_