



# MINNESOTA DEPARTMENT OF TRANSPORTATION

## METRO DIVISION - TRAFFIC ENGINEERING

### SIGNAL WARRANTS ANALYSIS

LOCATION: TH-242 & JEFFERSON ST

COUNTY: ANOKA

REF. POINT: 006.741

DATE: 7/15/1996

OPERATOR: DR

| Speed | Approach Description                     | Lanes |
|-------|--|-------|
| 50    | Major App1: TH-242 EB, W OF JEFFERSON ST | 2     |
| 50    | Major App3: TH-242 WB, E OF JEFFERSON ST | 2     |
| 0     | Minor App2: N/A                          | 0     |
| 40    | Minor App4: JEFFERSON ST SB, N OF TH-242 | 2     |

0.70 FACTOR USED? YES

POPULATION < 10,000? NO

EXISTING SIGNAL ? NO

| HOUR          | 420/630      |              |           |             | 0/0          |              | 140/70             |                    | 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   | 125          | 101          | 226       | /           | 0            | 9            | /                  | /                  | /              |
| 1:00 - 2:00   | 57           | 52           | 109       | /           | 0            | 4            | /                  | /                  | /              |
| 2:00 - 3:00   | 48           | 42           | 90        | /           | 0            | 5            | /                  | /                  | /              |
| 3:00 - 4:00   | 44           | 29           | 73        | /           | 0            | 3            | /                  | /                  | /              |
| 4:00 - 5:00   | 59           | 48           | 107       | /           | 0            | 12           | /                  | /                  | /              |
| 5:00 - 6:00   | 194          | 172          | 366       | /           | 0            | 61           | /                  | /                  | /              |
| 6:00 - 7:00   | 440          | 491          | 931       | X/X         | 0            | 152          | /                  | X/X                | X/X            |
| 7:00 - 8:00   | 562          | 603          | 1165      | X/X         | 0            | 146          | /                  | X/X                | X/X            |
| 8:00 - 9:00   | 493          | 537          | 1030      | X/X         | 0            | 116          | /                  | /X                 | /X             |
| 9:00 - 10:00  | 477          | 439          | 916       | X/X         | 0            | 94           | /                  | /X                 | /X             |
| 10:00 - 11:00 | 493          | 472          | 965       | X/X         | 0            | 114          | /                  | /X                 | /X             |
| 11:00 - 12:00 | 616          | 521          | 1137      | X/X         | 0            | 136          | /                  | /X                 | /X             |
| 12:00 - 13:00 | 586          | 567          | 1153      | X/X         | 0            | 120          | /                  | /X                 | /X             |
| 13:00 - 14:00 | 588          | 540          | 1128      | X/X         | 0            | 114          | /                  | /X                 | /X             |
| 14:00 - 15:00 | 667          | 554          | 1221      | X/X         | 0            | 149          | /                  | X/X                | X/X            |
| 15:00 - 16:00 | 822          | 685          | 1507      | X/X         | 0            | 120          | /                  | /X                 | /X             |
| 16:00 - 17:00 | 1001         | 825          | 1826      | X/X         | 0            | 116          | /                  | /X                 | /X             |
| 17:00 - 18:00 | 1040         | 862          | 1902      | X/X         | 0            | 153          | /                  | X/X                | X/X            |
| 18:00 - 19:00 | 835          | 746          | 1581      | X/X         | 0            | 163          | /                  | X/X                | X/X            |
| 19:00 - 20:00 | 600          | 578          | 1178      | X/X         | 0            | 104          | /                  | /X                 | /X             |
| 20:00 - 21:00 | 700          | 514          | 1214      | X/X         | 0            | 111          | /                  | /X                 | /X             |
| 21:00 - 22:00 | 568          | 434          | 1002      | X/X         | 0            | 87           | /                  | /X                 | /X             |
| 22:00 - 23:00 | 333          | 285          | 618       | X/          | 0            | 63           | /                  | /                  | /              |
| 23:00 - 24:00 | 211          | 184          | 395       | /           | 0            | 34           | /                  | /                  | /              |

|            | Met (Hr) | Required (Hr) |                                  |
|------------|----------|---------------|----------------------------------|
| Warrant 1  | 5        | 8             | Not satisfied                    |
| Warrant 2  | 16       | 8             | Satisfied                        |
| Warrant 6  | 17       | 8             | Satisfied, check accident record |
| Warrant 8  | 12       | 8             | Satisfied                        |
| Warrant 9  | 16       | 4             | Satisfied                        |
| Warrant 11 | 11       | 1             | Satisfied                        |

LOCATION: TH-242 & JEFFERSON ST

COUNTY: ANOKA

REF. POINT: 006.741

DATE: 7/15/1996

OPERATOR: DR

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

| Speed | Approach Description                     | Lanes |
|-------|--|-------|
| 50    | Major App1: TH-242 EB, W OF JEFFERSON ST | 2     |
| 50    | Major App3: TH-242 WB, E OF JEFFERSON ST | 2     |
| 0     | Minor App2: N/A                          | 0     |
| 40    | Minor App4: JEFFERSON ST SB, N OF TH-242 | 2     |

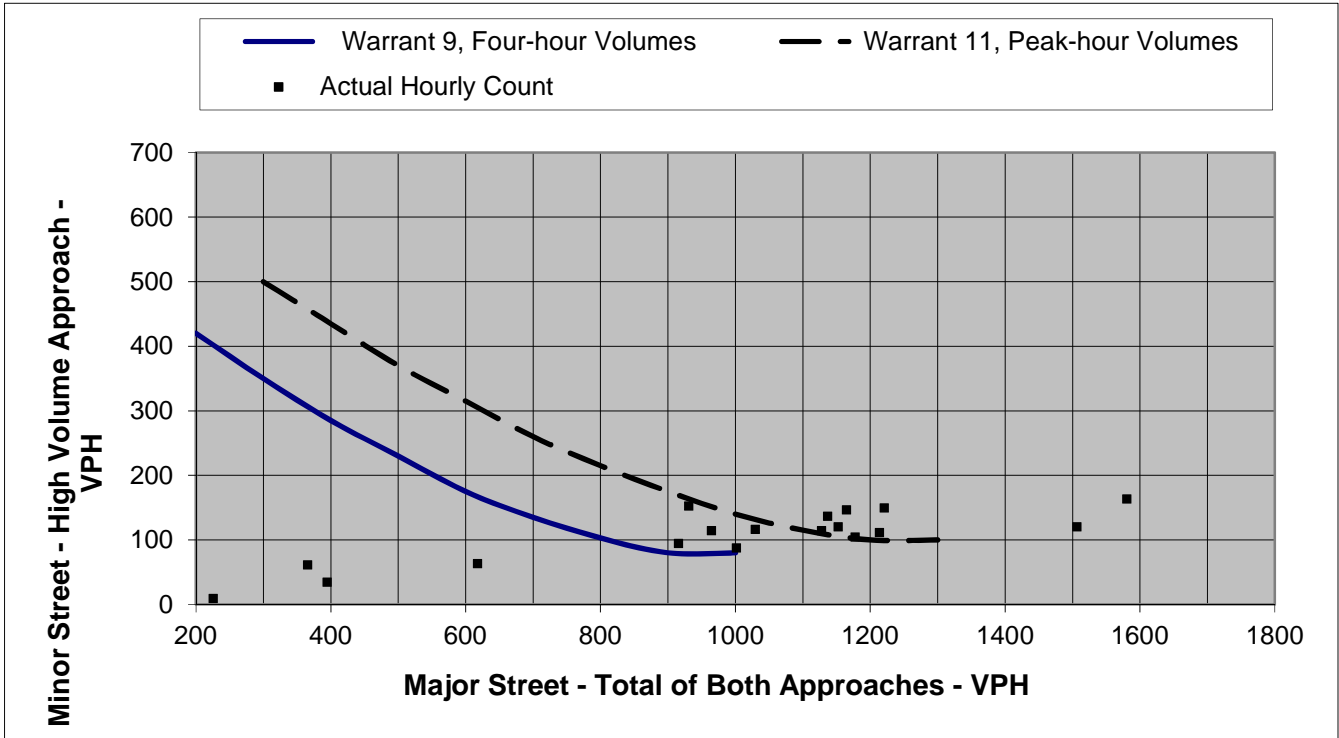


Figure 1. Four Hour and Peak Hour Warrant Analysis

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   | 420              |               | 226                 | 9                   |
| 300   | 350              | 500           | 109                 | 4                   |
| 400   | 285              | 435           | 90                  | 5                   |
| 500   | 230              | 370           | 73                  | 3                   |
| 600   | 175              | 315           | 107                 | 12                  |
| 700   | 135              | 260           | 366                 | 61                  |
| 800   | 103              | 215           | 931                 | 152                 |
| 900   | 80               | 175           | 1165                | 146                 |
| 1000  | 80               | 140           | 1030                | 116                 |
| 1100  |                  | 115           | 916                 | 94                  |
| 1200  |                  | 100           | 965                 | 114                 |
| 1300  |                  | 100           | 1137                | 136                 |
| 1400  |                  |               | 1153                | 120                 |
| 1500  |                  |               | 1128                | 114                 |
| 1600  |                  |               | 1221                | 149                 |
| 1700  |                  |               | 1507                | 120                 |
| 1800  |                  |               | 1826                | 116                 |
|       |                  |               | 1902                | 153                 |
|       |                  |               | 1581                | 163                 |
|       |                  |               | 1178                | 104                 |
|       |                  |               | 1214                | 111                 |
|       |                  |               | 1002                | 87                  |
|       |                  |               | 618                 | 63                  |
|       |                  |               | 395                 | 34                  |

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-242 & JEFFERSON ST

COUNTY: ANOKA

REF. POINT: 006.741

DATE: 7/15/1996

OPERATOR: DR

| Speed | Approach Description                     | Lanes |
|-------|--|-------|
| 50    | Major App1: TH-242 EB, W OF JEFFERSON ST | 2     |
| 50    | Major App3: TH-242 WB, E OF JEFFERSON ST | 2     |
| 0     | Minor App2: N/A                          | 0     |
| 40    | Minor App4: JEFFERSON ST SB, N OF TH-242 | 2     |

0.70 FACTOR USED? Yes

| HOUR          | MAJOR APP. 1 | MAJOR APP. 3 | MINOR APP. 2 | MINOR APP. 4 | 350                          | 140                            | WARRANT MET |
|---------------|--------------|--------------|--------------|--------------|------------------------------|--------------------------------|-------------|
|               |              |              |              |              | TOTAL<br>Σ (APP.1 to APP. 4) | MINOR TOTAL<br>APP. 2 + APP. 4 |             |
| 0:00 - 1:00   | 125          | 101          | 0            | 9            | 235                          | 9                              | /           |
| 1:00 - 2:00   | 57           | 52           | 0            | 4            | 113                          | 4                              | /           |
| 2:00 - 3:00   | 48           | 42           | 0            | 5            | 95                           | 5                              | /           |
| 3:00 - 4:00   | 44           | 29           | 0            | 3            | 76                           | 3                              | /           |
| 4:00 - 5:00   | 59           | 48           | 0            | 12           | 119                          | 12                             | /           |
| 5:00 - 6:00   | 194          | 172          | 0            | 61           | 427                          | 61                             | X/          |
| 6:00 - 7:00   | 440          | 491          | 0            | 152          | 1083                         | 152                            | X/X         |
| 7:00 - 8:00   | 562          | 603          | 0            | 146          | 1311                         | 146                            | X/X         |
| 8:00 - 9:00   | 493          | 537          | 0            | 116          | 1146                         | 116                            | X/          |
| 9:00 - 10:00  | 477          | 439          | 0            | 94           | 1010                         | 94                             | X/          |
| 10:00 - 11:00 | 493          | 472          | 0            | 114          | 1079                         | 114                            | X/          |
| 11:00 - 12:00 | 616          | 521          | 0            | 136          | 1273                         | 136                            | X/          |
| 12:00 - 13:00 | 586          | 567          | 0            | 120          | 1273                         | 120                            | X/          |
| 13:00 - 14:00 | 588          | 540          | 0            | 114          | 1242                         | 114                            | X/          |
| 14:00 - 15:00 | 667          | 554          | 0            | 149          | 1370                         | 149                            | X/X         |
| 15:00 - 16:00 | 822          | 685          | 0            | 120          | 1627                         | 120                            | X/          |
| 16:00 - 17:00 | 1001         | 825          | 0            | 116          | 1942                         | 116                            | X/          |
| 17:00 - 18:00 | 1040         | 862          | 0            | 153          | 2055                         | 153                            | X/X         |
| 18:00 - 19:00 | 835          | 746          | 0            | 163          | 1744                         | 163                            | X/X         |
| 19:00 - 20:00 | 600          | 578          | 0            | 104          | 1282                         | 104                            | X/          |
| 20:00 - 21:00 | 700          | 514          | 0            | 111          | 1325                         | 111                            | X/          |
| 21:00 - 22:00 | 568          | 434          | 0            | 87           | 1089                         | 87                             | X/          |
| 22:00 - 23:00 | 333          | 285          | 0            | 63           | 681                          | 63                             | X/          |
| 23:00 - 24:00 | 211          | 184          | 0            | 34           | 429                          | 34                             | X/          |

Allway Stop Warrant: Met (Hr) 5 Required (Hr) 8 Not satisfied

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