



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

SIGNAL WARRANTS ANALYSIS

LOCATION: TH-149 & MARIE AVE

COUNTY: DAKOTA

REF. POINT: 006.207

DATE: 10/16/1996

OPERATOR: DR

| Speed | Approach Description | Lanes |
|-------|---------------------------------------|-------|
| 40 | Major App1: TH-149 NB, S OF MARIE AVE | 2 |
| 40 | Major App3: TH-149 SB, N OF MARIE AVE | 2 |
| 30 | Minor App2: MARIE AVE EB, W OF TH-149 | 2 |
| 30 | Minor App4: MAIRE AVE WB, E OF TH-149 | 2 |

0.70 FACTOR USED? YES

POPULATION < 10,000? NO

EXISTING SIGNAL ? NO

| HOUR | 420/630 | | 140/70 | | 140/70 | | WARRANT MET APP. 2 | WARRANT MET APP. 4 | MET SAME HOURS |
|---------------|--------------|--------------|-----------|-------------|--------------|--------------|--------------------|--------------------|----------------|
| | MAJOR APP. 1 | MAJOR APP. 3 | TOTAL 1+3 | WARRANT MET | MINOR APP. 2 | MINOR APP. 4 | | | |
| 0:00 - 1:00 | 30 | 13 | 43 | / | 7 | 6 | / | / | / |
| 1:00 - 2:00 | 19 | 6 | 25 | / | 5 | 1 | / | / | / |
| 2:00 - 3:00 | 7 | 6 | 13 | / | 1 | 1 | / | / | / |
| 3:00 - 4:00 | 5 | 6 | 11 | / | 3 | 2 | / | / | / |
| 4:00 - 5:00 | 6 | 22 | 28 | / | 3 | 7 | / | / | / |
| 5:00 - 6:00 | 17 | 56 | 73 | / | 7 | 12 | / | / | / |
| 6:00 - 7:00 | 87 | 171 | 258 | / | 31 | 32 | / | / | / |
| 7:00 - 8:00 | 258 | 296 | 554 | X/ | 100 | 59 | /X | / | / |
| 8:00 - 9:00 | 193 | 226 | 419 | / | 88 | 65 | /X | / | / |
| 9:00 - 10:00 | 151 | 161 | 312 | / | 100 | 57 | /X | / | / |
| 10:00 - 11:00 | 149 | 165 | 314 | / | 81 | 53 | /X | / | / |
| 11:00 - 12:00 | 197 | 191 | 388 | / | 91 | 76 | /X | /X | / |
| 12:00 - 13:00 | 220 | 199 | 419 | / | 99 | 76 | /X | /X | / |
| 13:00 - 14:00 | 208 | 179 | 387 | / | 89 | 70 | /X | /X | / |
| 14:00 - 15:00 | 239 | 221 | 460 | X/ | 118 | 92 | /X | /X | / |
| 15:00 - 16:00 | 310 | 265 | 575 | X/ | 129 | 113 | /X | /X | / |
| 16:00 - 17:00 | 351 | 275 | 626 | X/ | 135 | 116 | /X | /X | / |
| 17:00 - 18:00 | 386 | 295 | 681 | X/X | 145 | 105 | X/X | /X | X/X |
| 18:00 - 19:00 | 271 | 238 | 509 | X/ | 122 | 100 | /X | /X | / |
| 19:00 - 20:00 | 183 | 177 | 360 | / | 72 | 66 | /X | / | / |
| 20:00 - 21:00 | 147 | 117 | 264 | / | 53 | 60 | / | / | / |
| 21:00 - 22:00 | 125 | 108 | 233 | / | 40 | 36 | / | / | / |
| 22:00 - 23:00 | 88 | 56 | 144 | / | 25 | 23 | / | / | / |
| 23:00 - 24:00 | 55 | 28 | 83 | / | 11 | 13 | / | / | / |

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

LOCATION: TH-149 & MARIE AVE

COUNTY: DAKOTA

REF. POINT: 006.207

DATE: 10/16/1996

OPERATOR: DR

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

| Speed | Approach Description | Lanes |
|-------|---------------------------------------|-------|
| 40 | Major App1: TH-149 NB, S OF MARIE AVE | 2 |
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| 30 | Minor App2: MARIE AVE EB, W OF TH-149 | 2 |
| 30 | Minor App4: MAIRE AVE WB, E OF TH-149 | 2 |

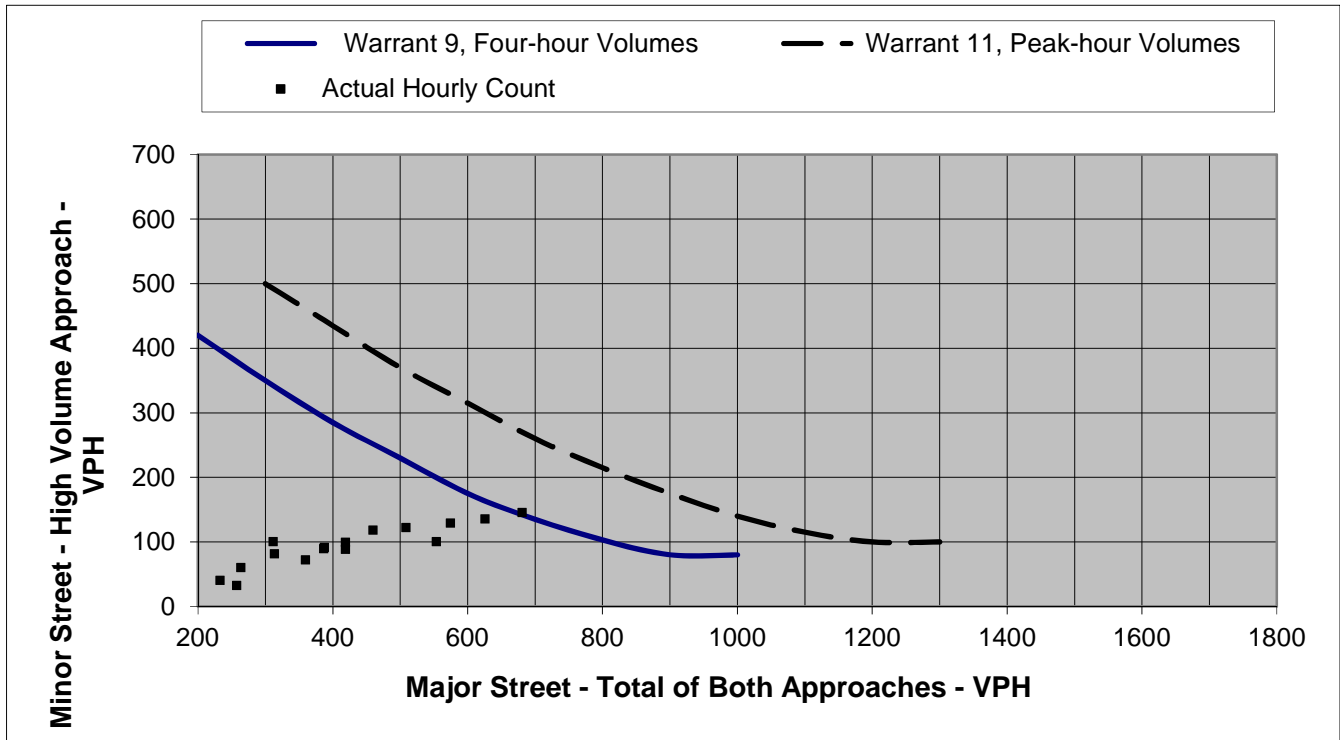


Figure 1. Four Hour and Peak Hour Warrant Analysis

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 | | 43 | 7 |
| 300 | 350 | 500 | 25 | 5 |
| 400 | 285 | 435 | 13 | 1 |
| 500 | 230 | 370 | 11 | 3 |
| 600 | 175 | 315 | 28 | 7 |
| 700 | 135 | 260 | 73 | 12 |
| 800 | 103 | 215 | 258 | 32 |
| 900 | 80 | 175 | 554 | 100 |
| 1000 | 80 | 140 | 419 | 88 |
| 1100 | | 115 | 312 | 100 |
| 1200 | | 100 | 314 | 81 |
| 1300 | | 100 | 388 | 91 |
| 1400 | | | 419 | 99 |
| 1500 | | | 387 | 89 |
| 1600 | | | 460 | 118 |
| 1700 | | | 575 | 129 |
| 1800 | | | 626 | 135 |
| | | | 681 | 145 |
| | | | 509 | 122 |
| | | | 360 | 72 |
| | | | 264 | 60 |
| | | | 233 | 40 |
| | | | 144 | 25 |
| | | | 83 | 13 |

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-149 & MARIE AVE

COUNTY: DAKOTA

REF. POINT: 006.207

DATE: 10/16/1996

OPERATOR: DR

| Speed | Approach Description | Lanes |
|-------|---------------------------------------|-------|
| 40 | Major App1: TH-149 NB, S OF MARIE AVE | 2 |
| 40 | Major App3: TH-149 SB, N OF MARIE AVE | 2 |
| 30 | Minor App2: MARIE AVE EB, W OF TH-149 | 2 |
| 30 | Minor App4: MAIRE AVE WB, E OF TH-149 | 2 |

0.70 FACTOR USED? Yes

| HOUR | MAJOR APP. 1 | MAJOR APP. 3 | MINOR APP. 2 | MINOR APP. 4 | 350 | 140 | WARRANT MET |
|---------------|--------------|--------------|--------------|--------------|------------------------------|--------------------------------|-------------|
| | | | | | TOTAL Σ (APP.1 to APP. 4) | MINOR TOTAL APP. 2 + APP. 4 | |
| 0:00 - 1:00 | 30 | 13 | 7 | 6 | 56 | 13 | / |
| 1:00 - 2:00 | 19 | 6 | 5 | 1 | 31 | 6 | / |
| 2:00 - 3:00 | 7 | 6 | 1 | 1 | 15 | 2 | / |
| 3:00 - 4:00 | 5 | 6 | 3 | 2 | 16 | 5 | / |
| 4:00 - 5:00 | 6 | 22 | 3 | 7 | 38 | 10 | / |
| 5:00 - 6:00 | 17 | 56 | 7 | 12 | 92 | 19 | / |
| 6:00 - 7:00 | 87 | 171 | 31 | 32 | 321 | 63 | / |
| 7:00 - 8:00 | 258 | 296 | 100 | 59 | 713 | 159 | X/X |
| 8:00 - 9:00 | 193 | 226 | 88 | 65 | 572 | 153 | X/X |
| 9:00 - 10:00 | 151 | 161 | 100 | 57 | 469 | 157 | X/X |
| 10:00 - 11:00 | 149 | 165 | 81 | 53 | 448 | 134 | X/ |
| 11:00 - 12:00 | 197 | 191 | 91 | 76 | 555 | 167 | X/X |
| 12:00 - 13:00 | 220 | 199 | 99 | 76 | 594 | 175 | X/X |
| 13:00 - 14:00 | 208 | 179 | 89 | 70 | 546 | 159 | X/X |
| 14:00 - 15:00 | 239 | 221 | 118 | 92 | 670 | 210 | X/X |
| 15:00 - 16:00 | 310 | 265 | 129 | 113 | 817 | 242 | X/X |
| 16:00 - 17:00 | 351 | 275 | 135 | 116 | 877 | 251 | X/X |
| 17:00 - 18:00 | 386 | 295 | 145 | 105 | 931 | 250 | X/X |
| 18:00 - 19:00 | 271 | 238 | 122 | 100 | 731 | 222 | X/X |
| 19:00 - 20:00 | 183 | 177 | 72 | 66 | 498 | 138 | X/ |
| 20:00 - 21:00 | 147 | 117 | 53 | 60 | 377 | 113 | X/ |
| 21:00 - 22:00 | 125 | 108 | 40 | 36 | 309 | 76 | / |
| 22:00 - 23:00 | 88 | 56 | 25 | 23 | 192 | 48 | / |
| 23:00 - 24:00 | 55 | 28 | 11 | 13 | 107 | 24 | / |

Met (Hr) Required (Hr)

Allway Stop Warrant: **11** 8 **Satisfied**

REMARKS: _____

