



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

SIGNAL WARRANTS ANALYSIS

LOCATION: TH-36/CHESTNUT ST. E & WATER ST.

COUNTY: WASHINGTON

REF. POINT: 205.202

DATE: 3/21/1996

OPERATOR: RE

| Speed | Approach Description | Lanes |
|-------|--|-------|
| 30 | Major App1: CHESTNUT ST/TH-36 EB, W OF WATER ST. | 1 |
| 30 | Major App3: CHESTNUT ST/TH-36 WB, E OF WATER ST. | 2 |
| 30 | Minor App2: WATER ST. NB, S OF CHESTNUT ST/TH-36 | 1 |
| 30 | Minor App4: WATER ST. SB, N OD CHESTNUT ST/TH-36 | 1 |

0.70 FACTOR USED? NO

POPULATION < 10,000? NO

EXISTING SIGNAL ? NO

| HOUR | 600/900 | | | | 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 | 104 | 33 | 137 | / | 6 | 3 | / | / | / |
| 1:00 - 2:00 | 60 | 24 | 84 | / | 4 | 4 | / | / | / |
| 2:00 - 3:00 | 26 | 20 | 46 | / | 0 | 0 | / | / | / |
| 3:00 - 4:00 | 30 | 27 | 57 | / | 0 | 0 | / | / | / |
| 4:00 - 5:00 | 15 | 87 | 102 | / | 1 | 2 | / | / | / |
| 5:00 - 6:00 | 39 | 573 | 612 | X/ | 1 | 2 | / | / | / |
| 6:00 - 7:00 | 142 | 961 | 1103 | X/X | 3 | 5 | / | / | / |
| 7:00 - 8:00 | 326 | 849 | 1175 | X/X | 11 | 14 | / | / | / |
| 8:00 - 9:00 | 236 | 522 | 758 | X/ | 13 | 22 | / | / | / |
| 9:00 - 10:00 | 219 | 403 | 622 | X/ | 13 | 24 | / | / | / |
| 10:00 - 11:00 | 335 | 370 | 705 | X/ | 16 | 33 | / | / | / |
| 11:00 - 12:00 | 335 | 362 | 697 | X/ | 16 | 36 | / | / | / |
| 12:00 - 13:00 | 453 | 341 | 794 | X/ | 24 | 36 | / | / | / |
| 13:00 - 14:00 | 440 | 406 | 846 | X/ | 21 | 41 | / | / | / |
| 14:00 - 15:00 | 495 | 433 | 928 | X/X | 28 | 33 | / | / | / |
| 15:00 - 16:00 | 920 | 325 | 1245 | X/X | 32 | 38 | / | / | / |
| 16:00 - 17:00 | 969 | 383 | 1352 | X/X | 30 | 24 | / | / | / |
| 17:00 - 18:00 | 829 | 428 | 1257 | X/X | 27 | 30 | / | / | / |
| 18:00 - 19:00 | 538 | 328 | 866 | X/ | 21 | 30 | / | / | / |
| 19:00 - 20:00 | 384 | 196 | 580 | / | 16 | 18 | / | / | / |
| 20:00 - 21:00 | 340 | 135 | 475 | / | 15 | 16 | / | / | / |
| 21:00 - 22:00 | 291 | 148 | 439 | / | 15 | 12 | / | / | / |
| 22:00 - 23:00 | 193 | 179 | 372 | / | 6 | 4 | / | / | / |
| 23:00 - 24:00 | 252 | 44 | 296 | / | 6 | 5 | / | / | / |

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

LOCATION: TH-36/CHESTNUT ST. EB, W OF WATER ST.

COUNTY: WASHINGTON

REF. POINT: 205.202

DATE: 3/21/1996

OPERATOR: RE

| Speed | Approach Description | Lanes |
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| 30 | Minor App2: WATER ST. NB, S OF CHESTNUT ST/TH-36 | 1 |
| 30 | Minor App4: WATER ST. SB, N OD CHESTNUT ST/TH-36 | 1 |

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

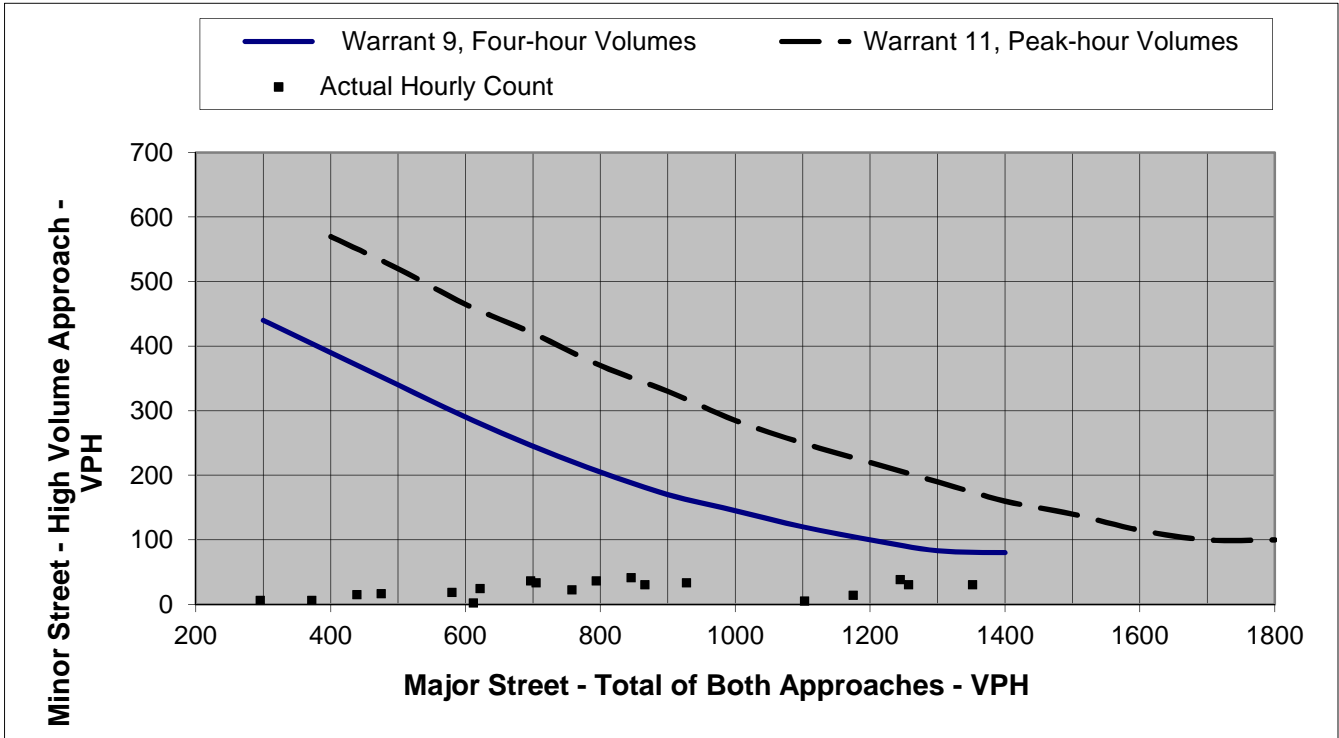


Figure 1. Four Hour and Peak Hour Warrant Analysis

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 | | | 137 | 6 |
| 300 | 440 | | 84 | 4 |
| 400 | 390 | 570 | 46 | 0 |
| 500 | 340 | 520 | 57 | 0 |
| 600 | 290 | 465 | 102 | 2 |
| 700 | 245 | 420 | 612 | 2 |
| 800 | 205 | 370 | 1103 | 5 |
| 900 | 170 | 330 | 1175 | 14 |
| 1000 | 145 | 285 | 758 | 22 |
| 1100 | 120 | 250 | 622 | 24 |
| 1200 | 100 | 220 | 705 | 33 |
| 1300 | 83 | 190 | 697 | 36 |
| 1400 | 80 | 160 | 794 | 36 |
| 1500 | | 140 | 846 | 41 |
| 1600 | | 115 | 928 | 33 |
| 1700 | | 100 | 1245 | 38 |
| 1800 | | 100 | 1352 | 30 |
| | | | 1257 | 30 |
| | | | 866 | 30 |
| | | | 580 | 18 |
| | | | 475 | 16 |
| | | | 439 | 15 |
| | | | 372 | 6 |
| | | | 296 | 6 |

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-36/CHESTNUT ST. E & WATER ST.

COUNTY: WASHINGTON

REF. POINT: 205.202

DATE:

OPERATOR: RE

| Speed | Approach Description | Lanes |
|-------|--|-------|
| 30 | Major App1: CHESTNUT ST/TH-36 EB, W OF WATER ST. | 1 |
| 30 | Major App3: CHESTNUT ST/TH-36 WB, E OF WATER ST. | 2 |
| 30 | Minor App2: WATER ST. NB, S OF CHESTNUT ST/TH-36 | 1 |
| 30 | Minor App4: WATER ST. SB, N OD CHESTNUT ST/TH-36 | 1 |

0.70 FACTOR USED? No

| HOUR | MAJOR APP. 1 | MAJOR APP. 3 | MINOR APP. 2 | MINOR APP. 4 | 500 | 200 | WARRANT MET |
|---------------|--------------|--------------|--------------|--------------|------------------------------|--------------------------------|-------------|
| | | | | | TOTAL Σ (APP.1 to APP. 4) | MINOR TOTAL APP. 2 + APP. 4 | |
| 0:00 - 1:00 | 104 | 33 | 6 | 3 | 146 | 9 | / |
| 1:00 - 2:00 | 60 | 24 | 4 | 4 | 92 | 8 | / |
| 2:00 - 3:00 | 26 | 20 | 0 | 0 | 46 | 0 | / |
| 3:00 - 4:00 | 30 | 27 | 0 | 0 | 57 | 0 | / |
| 4:00 - 5:00 | 15 | 87 | 1 | 2 | 105 | 3 | / |
| 5:00 - 6:00 | 39 | 573 | 1 | 2 | 615 | 3 | X/ |
| 6:00 - 7:00 | 142 | 961 | 3 | 5 | 1111 | 8 | X/ |
| 7:00 - 8:00 | 326 | 849 | 11 | 14 | 1200 | 25 | X/ |
| 8:00 - 9:00 | 236 | 522 | 13 | 22 | 793 | 35 | X/ |
| 9:00 - 10:00 | 219 | 403 | 13 | 24 | 659 | 37 | X/ |
| 10:00 - 11:00 | 335 | 370 | 16 | 33 | 754 | 49 | X/ |
| 11:00 - 12:00 | 335 | 362 | 16 | 36 | 749 | 52 | X/ |
| 12:00 - 13:00 | 453 | 341 | 24 | 36 | 854 | 60 | X/ |
| 13:00 - 14:00 | 440 | 406 | 21 | 41 | 908 | 62 | X/ |
| 14:00 - 15:00 | 495 | 433 | 28 | 33 | 989 | 61 | X/ |
| 15:00 - 16:00 | 920 | 325 | 32 | 38 | 1315 | 70 | X/ |
| 16:00 - 17:00 | 969 | 383 | 30 | 24 | 1406 | 54 | X/ |
| 17:00 - 18:00 | 829 | 428 | 27 | 30 | 1314 | 57 | X/ |
| 18:00 - 19:00 | 538 | 328 | 21 | 30 | 917 | 51 | X/ |
| 19:00 - 20:00 | 384 | 196 | 16 | 18 | 614 | 34 | X/ |
| 20:00 - 21:00 | 340 | 135 | 15 | 16 | 506 | 31 | X/ |
| 21:00 - 22:00 | 291 | 148 | 15 | 12 | 466 | 27 | / |
| 22:00 - 23:00 | 193 | 179 | 6 | 4 | 382 | 10 | / |
| 23:00 - 24:00 | 252 | 44 | 6 | 5 | 307 | 11 | / |

Allway Stop Warrant: Met (Hr) 0 Required (Hr) 8 Not satisfied

REMARKS: _____

