



# MINNESOTA DEPARTMENT OF TRANSPORTATION

## METRO DIVISION - TRAFFIC ENGINEERING

### SIGNAL WARRANTS ANALYSIS

LOCATION: TH-5 (STILLWATER RD) AT FERNDALE ST.

COUNTY: RAMSEY

REF. POINT: 186.363

DATE: 1/9/2007

OPERATOR: RE

Speed	Approach Description	Lanes
35	Major App1: TH-5/STILLWATER RD EB, W OF FERNDALE ST	1
35	Major App3: TH-5/STILLWATER RD WB, E OF FERNDALE ST	1
30	Minor App2: FERNDALE ST NB, S OF TH-5/STILLWATER RD	1
30	Minor App4: FERNDALE ST SB, N OF TH-5/STILLWATER RD	1

0.70 FACTOR USED?

N

POPULATION < 10,000?

EXISTING SIGNAL ?

THRESHOLDS 1A/1B:

500/750

150/75

150/75

HOUR	MAJOR APP. 1	MAJOR APP. 3	TOTAL 1+3	MAJOR 1A/1B	MINOR APP. 2	MINOR 2 1A/1B	MINOR APP. 4	MINOR 4 1A/1B	MET SAME 1A/1B
0:00 - 1:00	26	17	43	/	3	/	4	/	/
1:00 - 2:00	10	15	25	/	0	/	1	/	/
2:00 - 3:00	10	8	18	/	1	/	2	/	/
3:00 - 4:00	7	5	12	/	0	/	2	/	/
4:00 - 5:00	9	13	22	/	0	/	7	/	/
5:00 - 6:00	38	55	93	/	5	/	13	/	/
6:00 - 7:00	91	282	373	/	6	/	26	/	/
7:00 - 8:00	113	421	534	X/	19	/	57	/	/
8:00 - 9:00	143	228	371	/	13	/	42	/	/
9:00 - 10:00	159	188	347	/	7	/	27	/	/
10:00 - 11:00	121	122	243	/	7	/	23	/	/
11:00 - 12:00	170	153	323	/	7	/	20	/	/
12:00 - 13:00	151	164	315	/	8	/	26	/	/
13:00 - 14:00	176	167	343	/	6	/	17	/	/
14:00 - 15:00	214	196	410	/	15	/	36	/	/
15:00 - 16:00	326	234	560	X/	17	/	33	/	/
16:00 - 17:00	461	233	694	X/	15	/	39	/	/
17:00 - 18:00	388	216	604	X/	11	/	35	/	/
18:00 - 19:00	215	174	389	/	10	/	31	/	/
19:00 - 20:00	145	126	271	/	10	/	22	/	/
20:00 - 21:00	118	90	208	/	4	/	21	/	/
21:00 - 22:00	92	82	174	/	5	/	10	/	/
22:00 - 23:00	59	52	111	/	2	/	7	/	/
23:00 - 24:00	38	25	63	/	1	/	5	/	/

Met (Hr)      Required (Hr)

Warrant 1A	0	8	Not satisfied
Warrant 1B	0	8	Not satisfied
Warrant 2	0	4	Not satisfied
Warrant 3	0	1	Not satisfied
Warrant 7	0	8	Not satisfied

Four Hour Warrant				Peak Hour Warrant		
Major App	Minor App			Major App	Minor App	
	1 & 1	2 & 1	2 & 2		1 & 1	2 & 1
300	360	440	590	400	475	570
400	310	390	530	500	425	520
500	260	340	460	600	370	465
600	215	290	390	700	330	420
700	180	245	330	800	280	370
800	150	205	280	900	240	330
900	125	170	235	1000	204	285
1000	100	145	195	1100	175	250
1100	85	120	165	1200	150	220
1200	80	100	135	1300	130	190
1300	80	83	115	1400	115	160
1400	80	80	115	1500	100	140
1500	80	80	115	1600	100	115
1600	80	80	115	1700	100	100
1700	80	80	115	1800	100	100
1800	80	80	115			

Four Hour Warrant Factored				Peak Hour Warrant Factored		
Major App	Minor App			Major App	Minor App	
	1 & 1	2 & 1	2 & 2		1 & 1	2 & 1
200	250	320	420	300	320	380
300	210	265	350	400	270	335
400	170	215	285	500	225	285
500	130	170	230	600	180	240
600	93	130	175	700	145	200
700	70	100	135	800	115	160
800	60	80	103	900	90	135
900	60	65	80	1000	75	110
1000	60	60	80	1100	75	95
1100	60	60	80	1200	75	75
1200	60	60	80	1300	75	75
1300	60	60	80	1400	75	75
1400	60	60	80	1500	75	75
1500	60	60	80	1600	75	75
1600	60	60	80	1700	75	75
1700	60	60	80	1800	75	75
1800	60	60	80			

2 & 2  
725  
665  
600  
540  
480  
425  
375  
330  
285  
250  
220  
187  
165  
150  
150

ctored

2 & 2  
500  
435  
370  
315  
260  
215  
175  
140  
115  
100  
100  
100  
100  
100  
100  
100

LOCATION: TH-5 (STILLWATER RD) AT FERNDAL ST.

COUNTY: RAMSEY

REF. POINT: 186.363

DATE: 1/9/2007

OPERATOR: RE

0.70 FACTOR USED? N  
 POPULATION < 10,000? N  
 EXISTING SIGNAL ? N

Speed	Approach Description	Lanes
35	Major App1: TH-5/STILLWATER RD EB, W OF FERNDAL ST	1
35	Major App3: TH-5/STILLWATER RD WB, E OF FERNDAL ST	1
30	Minor App2: FERNDAL ST NB, S OF TH-5/STILLWATER RD	1
30	Minor App4: FERNDAL ST SB, N OF TH-5/STILLWATER RD	1

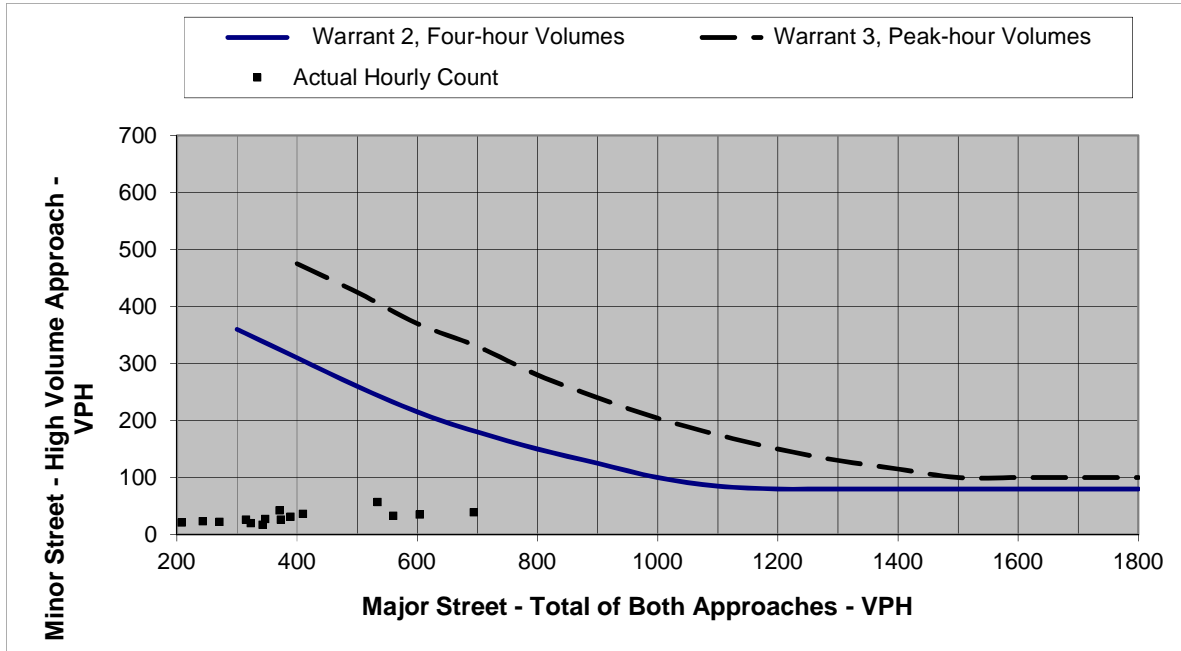


Figure 1. Four Hour and Peak Hour Warrant Analysis

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

Major	Warrant Criteria		Actual Hourly Count	
	Warrant 2, F	Warrant 3, Pe	Major	Actual Hourly Count
200			43	4
300	360		25	1
400	310	475	18	2
500	260	425	12	2
600	215	370	22	7
700	180	330	93	13
800	150	280	373	26
900	125	240	534	57
1000	100	204	371	42
1100	85	175	347	27
1200	80	150	243	23
1300	80	130	323	20
1400	80	115	315	26
1500	80	100	343	17
1600	80	100	410	36
1700	80	100	560	33
1800	80	100	694	39
			604	35
			389	31
			271	22
			208	21
			174	10
			111	7
			63	5



# MINNESOTA DEPARTMENT OF TRANSPORTATION

## METRO DIVISION - TRAFFIC ENGINEERING

### ALL WAY STOP WARRANT

LOCATION: TH-5 (STILLWATER RD) AT FERNDALE ST.

COUNTY: RAMSEY

REF. POINT: 186.363

DATE: 1/9/2007

OPERATOR: RE

Speed	Approach Description	Lanes
35	Major App1: TH-5/STILLWATER RD EB, W OF FERNDALE S	1
35	Major App3: TH-5/STILLWATER RD WB, E OF FERNDALE ST	1
30	Minor App2: FERNDALE ST NB, S OF TH-5/STILLWATER RD	1
30	Minor App4: FERNDALE ST SB, N OF TH-5/STILLWATER RD	1

0.70 FACTOR USED? No

HOUR					300	200	WARRANT MET
	MAJOR APP. 1	MAJOR APP. 3	MINOR APP. 2	MINOR APP. 4	MAJOR TOTAL Σ (APP. 1 & APP. 3)	MINOR TOTAL APP. 2 + APP. 4	
0:00 - 1:00	26	17	3	4	43	7	/
1:00 - 2:00	10	15	0	1	25	1	/
2:00 - 3:00	10	8	1	2	18	3	/
3:00 - 4:00	7	5	0	2	12	2	/
4:00 - 5:00	9	13	0	7	22	7	/
5:00 - 6:00	38	55	5	13	93	18	/
6:00 - 7:00	91	282	6	26	373	32	X/
7:00 - 8:00	113	421	19	57	534	76	X/
8:00 - 9:00	143	228	13	42	371	55	X/
9:00 - 10:00	159	188	7	27	347	34	X/
10:00 - 11:00	121	122	7	23	243	30	/
11:00 - 12:00	170	153	7	20	323	27	X/
12:00 - 13:00	151	164	8	26	315	34	X/
13:00 - 14:00	176	167	6	17	343	23	X/
14:00 - 15:00	214	196	15	36	410	51	X/
15:00 - 16:00	326	234	17	33	560	50	X/
16:00 - 17:00	461	233	15	39	694	54	X/
17:00 - 18:00	388	216	11	35	604	46	X/
18:00 - 19:00	215	174	10	31	389	41	X/
19:00 - 20:00	145	126	10	22	271	32	/
20:00 - 21:00	118	90	4	21	208	25	/
21:00 - 22:00	92	82	5	10	174	15	/
22:00 - 23:00	59	52	2	7	111	9	/
23:00 - 24:00	38	25	1	5	63	6	/

Met (Hr) Required (Hr)

Allway Stop Warrant: 0 8 Not satisfied

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