



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

SIGNAL WARRANTS ANALYSIS

LOCATION: TH-10 & GROVELAND RD.

COUNTY: RAMSEY

REF. POINT: 236.047

DATE: 4/9/1996

OPERATOR: RE

Speed	Approach Description	Lanes
50	Major App1: TH-10 EB, W OF GROVELAND RD.	4
50	Major App3: TH-10 WB, E OF GROVELAND RD.	4
30	Minor App2: GROVELAND RD. NB, S OF JCT OF TH-10	2
30	Minor App4: GROVELAND RD.SB, N OF JCT OF TH-10	2

0.70 FACTOR USED? YES

POPULATION < 10,000? NO

EXISTING SIGNAL ? NO

HOUR	420/630				140/70		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	102	237	339	/	1	2	/	/	/
1:00 - 2:00	76	141	217	/	1	3	/	/	/
2:00 - 3:00	0	97	97	/	0	1	/	/	/
3:00 - 4:00	96	72	168	/	1	2	/	/	/
4:00 - 5:00	169	95	264	/	0	6	/	/	/
5:00 - 6:00	724	257	981	X/X	3	14	/	/	/
6:00 - 7:00	1642	685	2327	X/X	7	42	/	/	/
7:00 - 8:00	2201	1094	3295	X/X	7	56	/	/	/
8:00 - 9:00	1530	923	2453	X/X	6	47	/	/	/
9:00 - 10:00	763	866	1629	X/X	8	36	/	/	/
10:00 - 11:00	929	893	1822	X/X	6	34	/	/	/
11:00 - 12:00	1004	997	2001	X/X	9	34	/	/	/
12:00 - 13:00	1137	1175	2312	X/X	9	44	/	/	/
13:00 - 14:00	1136	1209	2345	X/X	11	34	/	/	/
14:00 - 15:00	1233	1470	2703	X/X	6	32	/	/	/
15:00 - 16:00	1257	2003	3260	X/X	10	37	/	/	/
16:00 - 17:00	1350	2407	3757	X/X	9	38	/	/	/
17:00 - 18:00	1407	2160	3567	X/X	12	39	/	/	/
18:00 - 19:00	1201	1519	2720	X/X	8	45	/	/	/
19:00 - 20:00	944	1012	1956	X/X	13	37	/	/	/
20:00 - 21:00	808	873	1681	X/X	8	26	/	/	/
21:00 - 22:00	682	777	1459	X/X	6	15	/	/	/
22:00 - 23:00	495	484	979	X/X	2	9	/	/	/
23:00 - 24:00	279	354	633	X/X	2	7	/	/	/

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

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OPERATOR: RE

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

Speed	Approach Description	Lanes
50	Major App1: TH-10 EB, W OF GROVELAND RD.	4
50	Major App3: TH-10 WB, E OF GROVELAND RD.	4
30	Minor App2: GROVELAND RD. NB, S OF JCT OF TH-10	2
30	Minor App4: GROVELAND RD.SB, N OF JCT OF TH-10	2

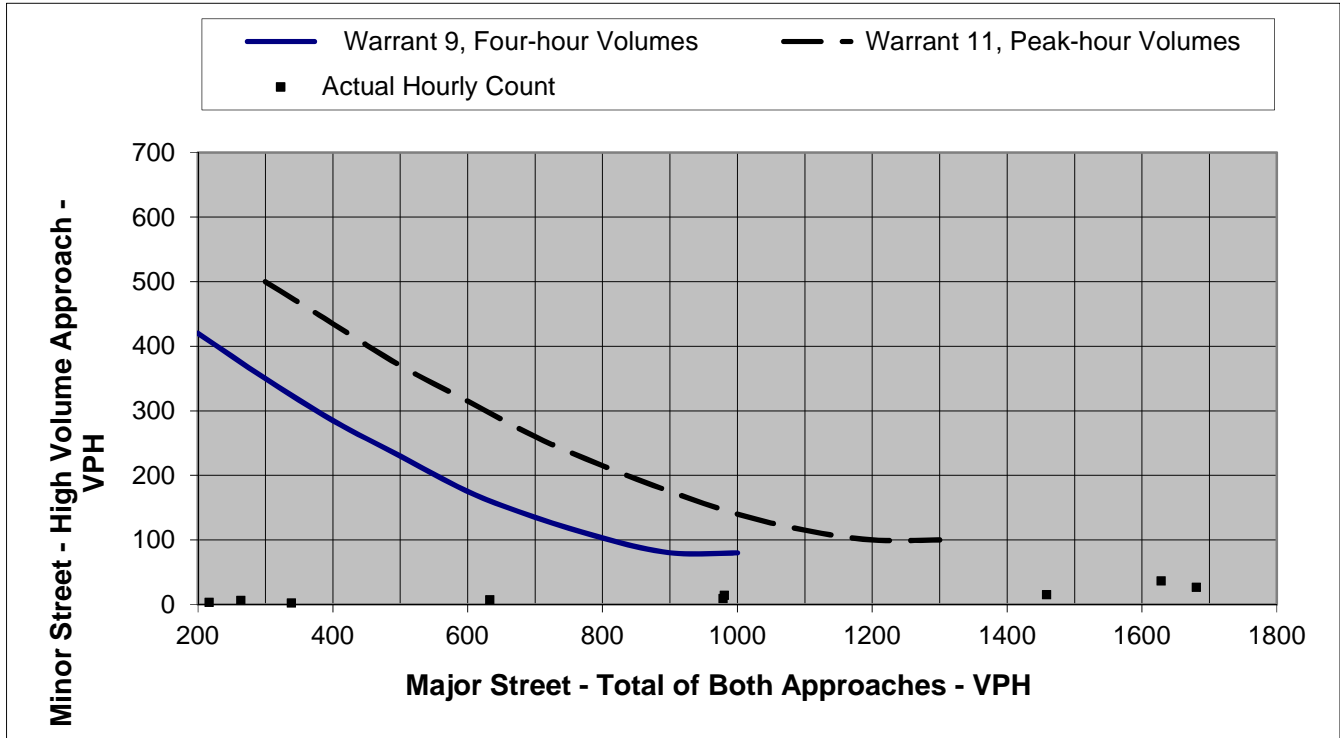


Figure 1. Four Hour and Peak Hour Warrant Analysis

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		339	2
300	350	500	217	3
400	285	435	97	1
500	230	370	168	2
600	175	315	264	6
700	135	260	981	14
800	103	215	2327	42
900	80	175	3295	56
1000	80	140	2453	47
1100		115	1629	36
1200		100	1822	34
1300		100	2001	34
1400			2312	44
1500			2345	34
1600			2703	32
1700			3260	37
1800			3757	38
			3567	39
			2720	45
			1956	37
			1681	26
			1459	15
			979	9
			633	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-10 & GROVELAND RD.

COUNTY: RAMSEY

REF. POINT: 236.047

DATE:

OPERATOR: RE

Speed	Approach Description	Lanes
50	Major App1: TH-10 EB, W OF GROVELAND RD.	4
50	Major App3: TH-10 WB, E OF GROVELAND RD.	4
30	Minor App2: GROVELAND RD. NB, S OF JCT OF TH-10	2
30	Minor App4: GROVELAND RD.SB, N OF JCT OF TH-10	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	102	237	1	2	342	3	/
1:00 - 2:00	76	141	1	3	221	4	/
2:00 - 3:00	0	97	0	1	98	1	/
3:00 - 4:00	96	72	1	2	171	3	/
4:00 - 5:00	169	95	0	6	270	6	/
5:00 - 6:00	724	257	3	14	998	17	X/
6:00 - 7:00	1642	685	7	42	2376	49	X/
7:00 - 8:00	2201	1094	7	56	3358	63	X/
8:00 - 9:00	1530	923	6	47	2506	53	X/
9:00 - 10:00	763	866	8	36	1673	44	X/
10:00 - 11:00	929	893	6	34	1862	40	X/
11:00 - 12:00	1004	997	9	34	2044	43	X/
12:00 - 13:00	1137	1175	9	44	2365	53	X/
13:00 - 14:00	1136	1209	11	34	2390	45	X/
14:00 - 15:00	1233	1470	6	32	2741	38	X/
15:00 - 16:00	1257	2003	10	37	3307	47	X/
16:00 - 17:00	1350	2407	9	38	3804	47	X/
17:00 - 18:00	1407	2160	12	39	3618	51	X/
18:00 - 19:00	1201	1519	8	45	2773	53	X/
19:00 - 20:00	944	1012	13	37	2006	50	X/
20:00 - 21:00	808	873	8	26	1715	34	X/
21:00 - 22:00	682	777	6	15	1480	21	X/
22:00 - 23:00	495	484	2	9	990	11	X/
23:00 - 24:00	279	354	2	7	642	9	X/

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

REMARKS: _____