



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

SIGNAL WARRANTS ANALYSIS

LOCATION: TH-49 & S. OWASSO BLVD

COUNTY: RAMSEY

REF. POINT: 016+00.997

DATE: 9/9/1998

OPERATOR: RE

EXISTING SIGNAL ?

NO

POPULATION LESS THAN 10,000?

NO

Speed	Approach Description	Lanes
40	Major App1: TH-49/RICE ST NB, S OF S OWASSO BLVD.	2
40	Major App3: TH-49/RICE ST. SB, N OF S OWASSO BLVD.	2
30	Minor App2: S.OWASSO BLVD. EB, W OF TH-49/RICE ST.	1
30	Minor App4: S.OWASSO BLVD. WB, E OF TH-49/RICE ST.	1

600/900 150/75 150/75

HOUR	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	MET SAME HOURS
0:00 - 1:00	43	30	73	/	5	2	/	/	/
1:00 - 2:00	13	19	32	/	3	8	/	/	/
2:00 - 3:00	9	12	21	/	1	2	/	/	/
3:00 - 4:00	30	41	71	/	2	5	/	/	/
4:00 - 5:00	88	144	232	/	13	20	/	/	/
5:00 - 6:00	281	373	654	X/	58	134	/	/X	/
6:00 - 7:00	442	635	1077	X/X	82	85	/X	/X	/X
7:00 - 8:00	408	541	949	X/X	73	94	/	/X	/X
8:00 - 9:00	449	485	934	X/X	83	101	/X	/X	/X
9:00 - 10:00	413	455	868	X/	73	92	/	/X	/
10:00 - 11:00	504	497	1001	X/X	72	137	/	/X	/X
11:00 - 12:00	642	572	1214	X/X	87	182	/X	X/X	X/X
12:00 - 13:00	617	516	1133	X/X	73	139	/	/X	/X
13:00 - 14:00	573	524	1097	X/X	72	120	/	/X	/X
14:00 - 15:00	673	592	1265	X/X	91	126	/X	/X	/X
15:00 - 16:00	790	637	1427	X/X	86	166	/X	X/X	X/X
16:00 - 17:00	851	634	1485	X/X	104	163	/X	X/X	X/X
17:00 - 18:00	595	501	1096	X/X	84	88	/X	/X	/X
18:00 - 19:00	457	408	865	X/	67	55	/	/	/
19:00 - 20:00	367	298	665	X/	44	38	/	/	/
20:00 - 21:00	250	238	488	/	30	22	/	/	/
21:00 - 22:00	161	160	321	/	19	13	/	/	/
22:00 - 23:00	136	96	232	/	11	7	/	/	/
23:00 - 24:00	58	51	109	/	6	3	/	/	/

Warrant 1 was met for 3 hours

Warrant 2 was met for 11 hours

Warrant 6 was met for 14 hours

Warrant 8 was met for 7 hours

Warrant 9 was met for 5 hours

Warrant 11 was met for 2 hours

LOCATION: TH-49 & S. OWASSO BLVD

COUNTY: RAMSEY

REF. POINT: 016+00.997

DATE: 9/9/1998

OPERATOR: RE

EXISTING SIGNAL ?

NO

POPULATION LESS THAN 10,000?

NO

Speed	Approach Description	Lanes
40	Major App1: TH-49/RICE ST NB, S OF S OWASSO BLVD.	2
40	Major App3: TH-49/RICE ST. SB, N OF S OWASSO BLVD.	2
30	Minor App2: S.OWASSO BLVD. EB, W OF TH-49/RICE ST.	1
30	Minor App4: S.OWASSO BLVD. WB, E OF TH-49/RICE ST.	1

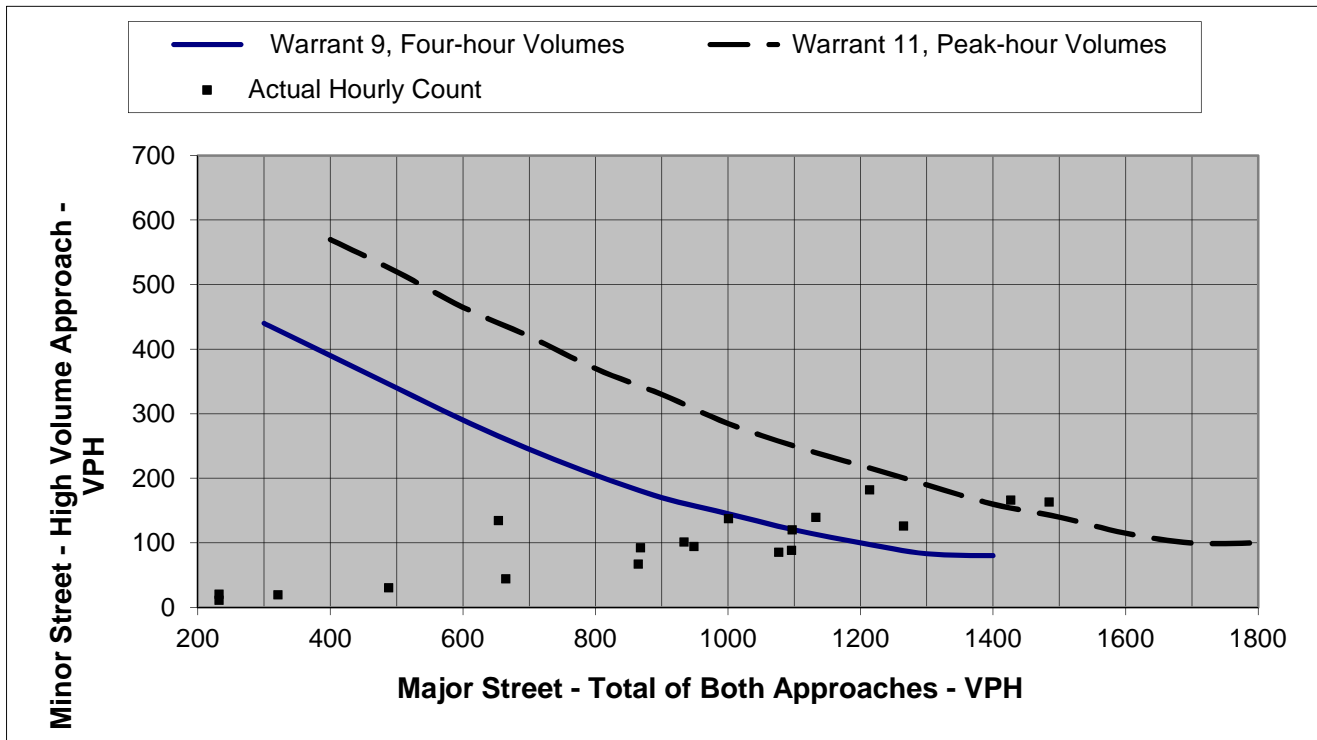


Figure 1. Four Hour and Peak Hour Warrant Analysis

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

Major	Warrant Criteria		Actual Hourly Count	
	Warrant 9, F	Warrant 11, P	Major	Actual Hourly Count
200			73	5
300	440		32	8
400	390	570	21	2
500	340	520	71	5
600	290	465	232	20
700	245	420	654	134
800	205	370	1077	85
900	170	330	949	94
1000	145	285	934	101
1100	120	250	868	92
1200	100	220	1001	137
1300	83	190	1214	182
1400	80	160	1133	139
1500		140	1097	120
1600		115	1265	126
1700		100	1427	166
1800		100	1485	163
			1096	88
			865	67
			665	44
			488	30
			321	19
			232	11
			109	6

Four Hour Warrant

Peak Hour

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

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

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-49 & S. OWASSO BLVD

COUNTY: RAMSEY

REF. POINT: 016+00.997

DATE:

OPERATOR: RE

EXISTING SIGNAL ?

POPULATION LESS THAN 10,000?

Speed	Approach Description	Lanes
40	Major App1: TH-49/RICE ST NB, S OF S OWASSO BLVD.	2
40	Major App3: TH-49/RICE ST. SB, N OF S OWASSO BLVD.	2
30	Minor App2: S.OWASSO BLVD. EB, W OF TH-49/RICE ST.	1
30	Minor App4: S.OWASSO BLVD. WB, E OF TH-49/RICE ST.	1

NO

NO

350

140

HOUR	MAJOR APP. 1	MAJOR APP. 3	MINOR APP. 2	MINOR APP. 4	TOTAL Σ (APP.1 to APP. 4)	MINOR TOTAL APP. 2 + APP. 4	WARRANT MET
0:00 - 1:00	43	30	5	2	80	7	/
1:00 - 2:00	13	19	3	8	43	11	/
2:00 - 3:00	9	12	1	2	24	3	/
3:00 - 4:00	30	41	2	5	78	7	/
4:00 - 5:00	88	144	13	20	265	33	/
5:00 - 6:00	281	373	58	134	846	192	X/X
6:00 - 7:00	442	635	82	85	1244	167	X/X
7:00 - 8:00	408	541	73	94	1116	167	X/X
8:00 - 9:00	449	485	83	101	1118	184	X/X
9:00 - 10:00	413	455	73	92	1033	165	X/X
10:00 - 11:00	504	497	72	137	1210	209	X/X
11:00 - 12:00	642	572	87	182	1483	269	X/X
12:00 - 13:00	617	516	73	139	1345	212	X/X
13:00 - 14:00	573	524	72	120	1289	192	X/X
14:00 - 15:00	673	592	91	126	1482	217	X/X
15:00 - 16:00	790	637	86	166	1679	252	X/X
16:00 - 17:00	851	634	104	163	1752	267	X/X
17:00 - 18:00	595	501	84	88	1268	172	X/X
18:00 - 19:00	457	408	67	55	987	122	X/
19:00 - 20:00	367	298	44	38	747	82	X/
20:00 - 21:00	250	238	30	22	540	52	X/
21:00 - 22:00	161	160	19	13	353	32	X/
22:00 - 23:00	136	96	11	7	250	18	/
23:00 - 24:00	58	51	6	3	118	9	/

Warrant Was Met : 13 Hours Satisfied Requirements

REMARKS: _____



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: TH-49/RICE ST NB, S OF S OWASSO BLVD.

COUNTY: RAMSEY

REF. PT.: 016+00.997

SITE CODE: Approach

OPERATOR: RE

FOR COUNTS BEGINNING: **September 9, 1998**

DATE HOUR \ DAY	7 MON.	8 TUE.	9 WED.	10 THU.	11 FRI.	12 SAT.	13 SUN.	AVE. WK.DAY	AVE. WKEND
0:00 - 1:00				56	31	95	81	43	88
1:00 - 2:00				12	15	31	33	13	32
2:00 - 3:00				8	10	26	12	9	19
3:00 - 4:00				32	29	24	22	30	23
4:00 - 5:00				85	92	52	33	88	42
5:00 - 6:00				274	288	80	32	281	56
6:00 - 7:00				431	454	153	63	442	108
7:00 - 8:00				387	430	277	137	408	207
8:00 - 9:00				415	484	384	243	449	313
9:00 - 10:00				400	426	508	347	413	427
10:00 - 11:00			509	479	526	539	474	504	506
11:00 - 12:00			644	637	646	568	486	642	527
12:00 - 13:00			588	590	675	505	393	617	449
13:00 - 14:00			550	586	584	518	352	573	435
14:00 - 15:00			639	665	716	495	413	673	454
15:00 - 16:00			733	770	867	495	407	790	451
16:00 - 17:00			840	868	847	416	371	851	393
17:00 - 18:00			604	562	620	348	349	595	348
18:00 - 19:00			467	462	442	309	320	457	314
19:00 - 20:00			369	354	378	253	257	367	255
20:00 - 21:00			251	255	245	218	144	250	181
21:00 - 22:00			135	143	207	166	115	161	140
22:00 - 23:00			134	129	145	165	81	136	123
23:00 - 24:00			49	41	84	91	32	58	61
TOTAL			6512	8641	9241	6716	5197	8850	5952

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> A:\49SOWASS.da1



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: S.OWASSO BLVD. EB, W OF TH-49/RICE ST.

COUNTY: RAMSEY

REF. PT.: 016+00.997

SITE CODE: Approach

OPERATOR: RE

FOR COUNTS BEGINNING: **September 9, 1998**

DATE HOUR \ DAY	7 MON.	8 TUE.	9 WED.	10 THU.	11 FRI.	12 SAT.	13 SUN.	AVE. WK.DAY	AVE. WKEND
0:00 - 1:00				3	7	6	13	5	9
1:00 - 2:00				5	2	7	4	3	5
2:00 - 3:00				2	0	4	1	1	2
3:00 - 4:00				3	2	2	2	2	2
4:00 - 5:00				12	14	2	3	13	2
5:00 - 6:00				52	64	18	13	58	15
6:00 - 7:00				93	72	27	25	82	26
7:00 - 8:00				62	84	61	56	73	58
8:00 - 9:00				76	91	86	47	83	66
9:00 - 10:00				70	76	101	70	73	85
10:00 - 11:00			72	70	75	94	72	72	83
11:00 - 12:00			81	82	98	91	85	87	88
12:00 - 13:00			69	66	86	99	86	73	92
13:00 - 14:00			56	77	84	100	70	72	85
14:00 - 15:00			89	82	102	67	101	91	84
15:00 - 16:00			84	76	98	88	85	86	86
16:00 - 17:00			116	83	115	79	79	104	79
17:00 - 18:00			78	97	78	78	67	84	72
18:00 - 19:00			65	67	70	56	57	67	56
19:00 - 20:00			52	33	47	32	37	44	34
20:00 - 21:00			29	39	23	27	26	30	26
21:00 - 22:00			16	18	24	27	16	19	21
22:00 - 23:00			7	8	18	31	10	11	20
23:00 - 24:00			6	3	10	13	7	6	10
TOTAL			820	1179	1340	1196	1032	1239	1106

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> A:\49SOWASS.da2



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: TH-49/RICE ST. SB, N OF S OWASSO BLVD.

COUNTY: RAMSEY

REF. PT.: 016+00.997

SITE CODE: Approach

OPERATOR: RE

FOR COUNTS BEGINNING: **September 9, 1998**

DATE HOUR \ DAY	7 MON.	8 TUE.	9 WED.	10 THU.	11 FRI.	12 SAT.	13 SUN.	AVE. WK.DAY	AVE. WKEND
0:00 - 1:00				33	28	46	67	30	56
1:00 - 2:00				16	23	23	27	19	25
2:00 - 3:00				12	13	19	18	12	18
3:00 - 4:00				40	43	42	23	41	32
4:00 - 5:00				141	147	53	21	144	37
5:00 - 6:00				365	381	86	46	373	66
6:00 - 7:00				656	615	140	97	635	118
7:00 - 8:00				537	545	334	186	541	260
8:00 - 9:00				501	469	394	312	485	353
9:00 - 10:00				423	488	425	377	455	401
10:00 - 11:00			471	499	523	515	371	497	443
11:00 - 12:00			582	548	586	482	416	572	449
12:00 - 13:00			490	528	532	492	359	516	425
13:00 - 14:00			502	525	546	443	339	524	391
14:00 - 15:00			537	587	652	424	404	592	414
15:00 - 16:00			658	620	634	458	451	637	454
16:00 - 17:00			636	615	653	405	411	634	408
17:00 - 18:00			497	545	463	439	442	501	440
18:00 - 19:00			418	406	402	354	380	408	367
19:00 - 20:00			296	290	308	288	245	298	266
20:00 - 21:00			239	232	243	173	171	238	172
21:00 - 22:00			136	141	204	158	139	160	148
22:00 - 23:00			89	73	128	122	56	96	89
23:00 - 24:00			33	47	74	75	30	51	52
TOTAL			5584	8380	8700	6390	5388	8459	5884

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> A:\49SOWASS.da3



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: S.OWASSO BLVD. WB, E OF TH-49/RICE ST.

COUNTY: RAMSEY

REF. PT.: 016+00.997

SITE CODE: Approach

OPERATOR: RE

FOR COUNTS BEGINNING: **September 9, 1998**

DATE HOUR \ DAY	7 MON.	8 TUE.	9 WED.	10 THU.	11 FRI.	12 SAT.	13 SUN.	AVE. WK.DAY	AVE. WKEND
0:00 - 1:00				4	1	3	3	2	3
1:00 - 2:00				9	7	4	3	8	3
2:00 - 3:00				1	3	4	1	2	2
3:00 - 4:00				5	5	5	1	5	3
4:00 - 5:00				24	16	12	3	20	7
5:00 - 6:00				124	144	9	1	134	5
6:00 - 7:00				90	80	16	5	85	10
7:00 - 8:00				99	89	32	10	94	21
8:00 - 9:00				93	110	28	16	101	22
9:00 - 10:00				91	93	36	23	92	29
10:00 - 11:00			123	138	150	47	35	137	41
11:00 - 12:00			185	175	188	68	34	182	51
12:00 - 13:00			120	162	135	63	32	139	47
13:00 - 14:00			107	125	130	45	15	120	30
14:00 - 15:00			120	131	127	46	36	126	41
15:00 - 16:00			154	179	165	46	29	166	37
16:00 - 17:00			178	173	140	46	50	163	48
17:00 - 18:00			93	80	91	23	34	88	28
18:00 - 19:00			59	67	41	31	47	55	39
19:00 - 20:00			29	42	45	18	29	38	23
20:00 - 21:00			18	30	19	16	11	22	13
21:00 - 22:00			14	16	11	6	4	13	5
22:00 - 23:00			6	7	10	9	1	7	5
23:00 - 24:00			1	1	8	4	2	3	3
TOTAL			1207	1866	1808	617	425	1802	516

24 HOURS FACTOR:

FACTORED ADT:

REMARKS: _____

CORRECTED AADT: _____

DATA FILE --> A:\49SOWASS.da4