



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

SIGNAL WARRANTS ANALYSIS

LOCATION: I-694 & VICTORIA AVE., N RAMPS

COUNTY: RAMSEY

REF. POINT: 043.606

DATE: 10/7/1996

OPERATOR: RE

Speed	Approach Description	Lanes
40	Major App1: VICTORIA AVE. NB, S OF N RAMP OF I-694	3
40	Major App3: VICTORIA AVE. SB, N OF N RAMP OF I-694	3
0	Minor App2: N/A	0
30	Minor App4: I-694 WB RAMP TO VICTORIA AVE.	1

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

HOUR	600/900			0/0		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	33	19	52	/	0	14	/	/	/
1:00 - 2:00	18	10	28	/	0	9	/	/	/
2:00 - 3:00	13	7	20	/	0	17	/	/	/
3:00 - 4:00	7	5	12	/	0	9	/	/	/
4:00 - 5:00	14	17	31	/	0	17	/	/	/
5:00 - 6:00	79	118	197	/	0	62	/	/	/
6:00 - 7:00	227	605	832	X/	0	216	/	X/X	X/
7:00 - 8:00	475	1168	1643	X/X	0	329	/	X/X	X/X
8:00 - 9:00	407	582	989	X/X	0	224	/	X/X	X/X
9:00 - 10:00	287	316	603	X/	0	146	/	/X	/
10:00 - 11:00	263	217	480	/	0	117	/	/X	/
11:00 - 12:00	361	328	689	X/	0	119	/	/X	/
12:00 - 13:00	397	322	719	X/	0	164	/	X/X	X/
13:00 - 14:00	371	261	632	X/	0	152	/	X/X	X/
14:00 - 15:00	429	302	731	X/	0	180	/	X/X	X/
15:00 - 16:00	673	463	1136	X/X	0	219	/	X/X	X/X
16:00 - 17:00	932	572	1504	X/X	0	264	/	X/X	X/X
17:00 - 18:00	956	602	1558	X/X	0	263	/	X/X	X/X
18:00 - 19:00	592	453	1045	X/X	0	185	/	X/X	X/X
19:00 - 20:00	376	222	598	/	0	139	/	/X	/
20:00 - 21:00	360	150	510	/	0	125	/	/X	/
21:00 - 22:00	267	97	364	/	0	112	/	/X	/
22:00 - 23:00	122	54	176	/	0	64	/	/	/
23:00 - 24:00	57	26	83	/	0	41	/	/	/

	Met (Hr)	Required (Hr)	
Warrant 1	10	8	Satisfied
Warrant 2	6	8	Not satisfied
Warrant 6	13	8	Satisfied, check accident record
Warrant 8	8	8	Satisfied
Warrant 9	7	4	Satisfied
Warrant 11	3	1	Satisfied

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COUNTY: RAMSEY

REF. POINT: 043.606

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OPERATOR: RE

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

Speed	Approach Description	Lanes
40	Major App1: VICTORIA AVE. NB, S OF N RAMP OF I-694	3
40	Major App3: VICTORIA AVE. SB, N OF N RAMP OF I-694	3
0	Minor App2: N/A	0
30	Minor App4: I-694 WB RAMP TO VICTORIA AVE.	1

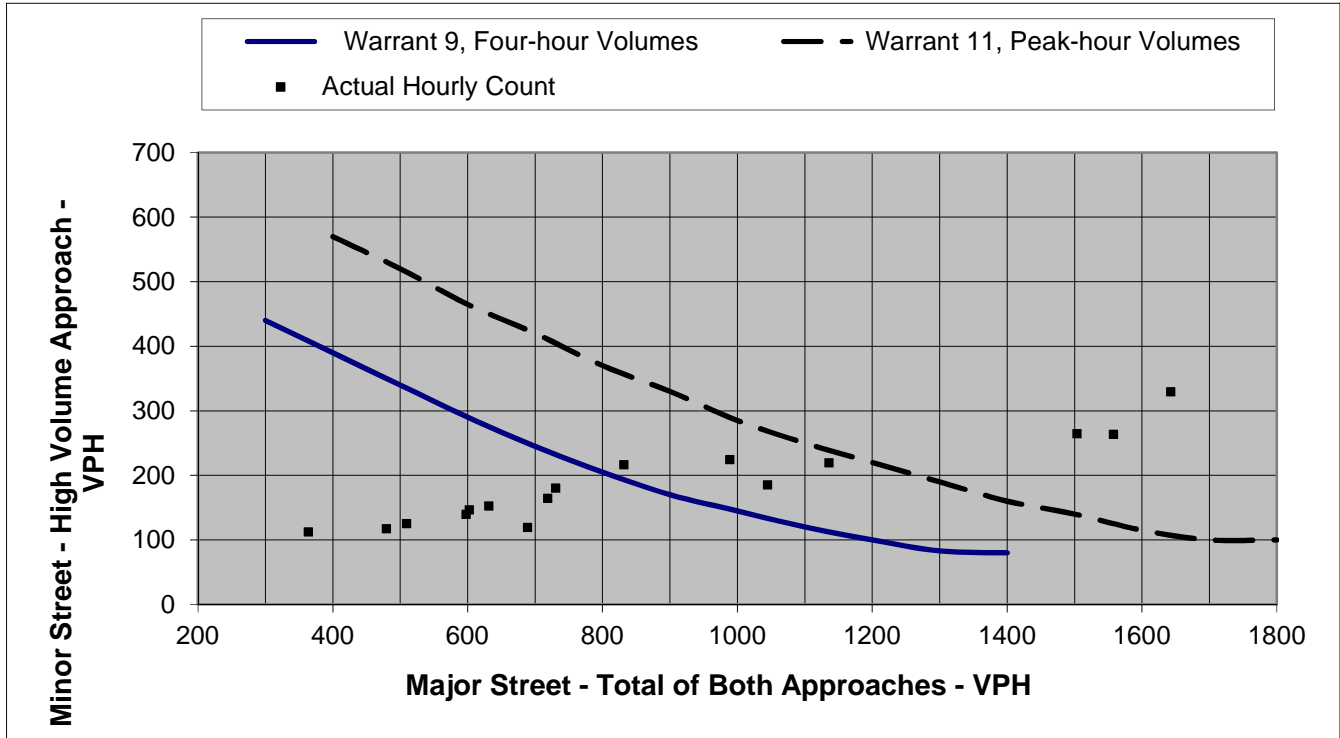


Figure 1. Four Hour and Peak Hour Warrant Analysis

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			52	14
300	440		28	9
400	390	570	20	17
500	340	520	12	9
600	290	465	31	17
700	245	420	197	62
800	205	370	832	216
900	170	330	1643	329
1000	145	285	989	224
1100	120	250	603	146
1200	100	220	480	117
1300	83	190	689	119
1400	80	160	719	164
1500		140	632	152
1600		115	731	180
1700		100	1136	219
1800		100	1504	264
			1558	263
			1045	185
			598	139
			510	125
			364	112
			176	64
			83	41

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: I-694 & VICTORIA AVE., N RAMPS

COUNTY: RAMSEY

REF. POINT: 043.606

DATE:

OPERATOR: RE

Speed	Approach Description	Lanes
40	Major App1: VICTORIA AVE. NB, S OF N RAMP OF I-694	3
40	Major App3: VICTORIA AVE. SB, N OF N RAMP OF I-694	3
0	Minor App2: N/A	0
30	Minor App4: I-694 WB RAMP TO VICTORIA AVE.	1

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	33	19	0	14	66	14	/
1:00 - 2:00	18	10	0	9	37	9	/
2:00 - 3:00	13	7	0	17	37	17	/
3:00 - 4:00	7	5	0	9	21	9	/
4:00 - 5:00	14	17	0	17	48	17	/
5:00 - 6:00	79	118	0	62	259	62	/
6:00 - 7:00	227	605	0	216	1048	216	X/X
7:00 - 8:00	475	1168	0	329	1972	329	X/X
8:00 - 9:00	407	582	0	224	1213	224	X/X
9:00 - 10:00	287	316	0	146	749	146	X/X
10:00 - 11:00	263	217	0	117	597	117	X/
11:00 - 12:00	361	328	0	119	808	119	X/
12:00 - 13:00	397	322	0	164	883	164	X/X
13:00 - 14:00	371	261	0	152	784	152	X/X
14:00 - 15:00	429	302	0	180	911	180	X/X
15:00 - 16:00	673	463	0	219	1355	219	X/X
16:00 - 17:00	932	572	0	264	1768	264	X/X
17:00 - 18:00	956	602	0	263	1821	263	X/X
18:00 - 19:00	592	453	0	185	1230	185	X/X
19:00 - 20:00	376	222	0	139	737	139	X/
20:00 - 21:00	360	150	0	125	635	125	X/
21:00 - 22:00	267	97	0	112	476	112	X/
22:00 - 23:00	122	54	0	64	240	64	/
23:00 - 24:00	57	26	0	41	124	41	/

Met (Hr) Required (Hr)

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

REMARKS: _____



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: VICTORIA AVE. NB, S OF N RAMP OF I-694

COUNTY: RAMSEY

REF. PT.: 043.606

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING: **October 7, 1996**

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		26	36	37				33	
1:00 - 2:00		21	14	20				18	
2:00 - 3:00		11	12	16				13	
3:00 - 4:00		6	8	8				7	
4:00 - 5:00		10	19	13				14	
5:00 - 6:00		85	79	74				79	
6:00 - 7:00		223	235	224				227	
7:00 - 8:00		484	466	476				475	
8:00 - 9:00		406	398	418				407	
9:00 - 10:00		275	295	292				287	
10:00 - 11:00		258	268					263	
11:00 - 12:00		382	341					361	
12:00 - 13:00		411	384					397	
13:00 - 14:00	360	351	402					371	
14:00 - 15:00	405	476	408					429	
15:00 - 16:00	661	702	656					673	
16:00 - 17:00	893	941	962					932	
17:00 - 18:00	986	972	910					956	
18:00 - 19:00	598	619	560					592	
19:00 - 20:00	372	380	377					376	
20:00 - 21:00	370	357	354					360	
21:00 - 22:00	230	309	264					267	
22:00 - 23:00	126	133	107					122	
23:00 - 24:00	47	63	63					57	
TOTAL	5048	7901	7618	1578				7716	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> A:\694VICNR.da1



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: N/A
 COUNTY: RAMSEY
 REF. PT.: 043.606

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING:

DATE HOUR \ DAY	MON.	TUE.	WED.	THU.	FRI.	SAT.	SUN.	AVE. WK.DAY	AVE. WKEND
0:00 - 1:00									
1:00 - 2:00									
2:00 - 3:00									
3:00 - 4:00									
4:00 - 5:00									
5:00 - 6:00									
6:00 - 7:00									
7:00 - 8:00									
8:00 - 9:00									
9:00 - 10:00									
10:00 - 11:00									
11:00 - 12:00									
12:00 - 13:00									
13:00 - 14:00									
14:00 - 15:00									
15:00 - 16:00									
16:00 - 17:00									
17:00 - 18:00									
18:00 - 19:00									
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									

TOTAL

24 HOURS FACTOR:

FACTORED ADT:

REMARKS: _____

CORRECTED AADT: _____

DATA FILE --> A:\694VICNR.da2



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: VICTORIA AVE. SB, N OF N RAMP OF I-694

COUNTY: RAMSEY

REF. PT.: 043.606

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING: **October 7, 1996**

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		20	20	18				19	
1:00 - 2:00		12	6	14				10	
2:00 - 3:00		4	7	11				7	
3:00 - 4:00		7	4	6				5	
4:00 - 5:00		18	16	19				17	
5:00 - 6:00		117	124	115				118	
6:00 - 7:00		639	601	576				605	
7:00 - 8:00		1150	1157	1199				1168	
8:00 - 9:00		577	573	598				582	
9:00 - 10:00		305	327					316	
10:00 - 11:00		216	219					217	
11:00 - 12:00		338	319					328	
12:00 - 13:00		328	316					322	
13:00 - 14:00	247	283	254					261	
14:00 - 15:00	306	307	294					302	
15:00 - 16:00	435	525	430					463	
16:00 - 17:00	541	593	583					572	
17:00 - 18:00	620	602	586					602	
18:00 - 19:00	478	440	441					453	
19:00 - 20:00	234	200	232					222	
20:00 - 21:00	156	154	142					150	
21:00 - 22:00	86	105	100					97	
22:00 - 23:00	56	61	46					54	
23:00 - 24:00	20	29	31					26	
TOTAL	3179	7030	6828	2556				6916	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS: _____

CORRECTED AADT: _____

DATA FILE --> A:\694VICNR.da3



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: I-694 WB RAMP TO VICTORIA AVE.

COUNTY: RAMSEY

REF. PT.: 043.606

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING: **October 7, 1996**

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		6	17	20				14	
1:00 - 2:00		14	5	9				9	
2:00 - 3:00		17	15	21				17	
3:00 - 4:00		12	7	8				9	
4:00 - 5:00		18	19	14				17	
5:00 - 6:00		63	65	58				62	
6:00 - 7:00		221	213	215				216	
7:00 - 8:00		313	357	318				329	
8:00 - 9:00		224	205	244				224	
9:00 - 10:00		148	144					146	
10:00 - 11:00		118	116					117	
11:00 - 12:00		116	123					119	
12:00 - 13:00	167	168	158					164	
13:00 - 14:00	145	180	131					152	
14:00 - 15:00	174	181	185					180	
15:00 - 16:00	218	231	209					219	
16:00 - 17:00	256	278	259					264	
17:00 - 18:00	226	318	245					263	
18:00 - 19:00	176	201	180					185	
19:00 - 20:00	140	135	143					139	
20:00 - 21:00	117	127	133					125	
21:00 - 22:00	97	124	117					112	
22:00 - 23:00	57	64	72					64	
23:00 - 24:00	40	45	38					41	
TOTAL	1813	3322	3156	907				3187	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> A:\694VICNR.da4