



# MINNESOTA DEPARTMENT OF TRANSPORTATION

## METRO DIVISION - TRAFFIC ENGINEERING

### SIGNAL WARRANTS ANALYSIS

LOCATION: I-94 & CSAH-15/MANNING AVE, N RAMPS

COUNTY: WASHINGTON

REF. POINT: 253.681

DATE: 10/1/1996

OPERATOR: RE

Speed	Approach Description	Lanes
55	Major App1: MANNING AVE/CSAH-15 NB, S OF N RAMPS OF	3
55	Major App3: CSAH-15 SB (W/O FREE RIGHTS), N OF N RAMP.	3
0	Minor App2: N/A	0
30	Minor App4: I-94 WB RAMP (W/O FREE RIGHT TURNS) TO CS	2

0.70 FACTOR USED? YES

POPULATION < 10,000? NO

EXISTING SIGNAL ? NO

HOUR	420/630				0/0		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	28	7	35	/	0	0	/	/	/
1:00 - 2:00	11	6	17	/	0	0	/	/	/
2:00 - 3:00	12	1	13	/	0	0	/	/	/
3:00 - 4:00	12	5	17	/	0	0	/	/	/
4:00 - 5:00	26	4	30	/	0	79	/	/X	/
5:00 - 6:00	105	26	131	/	0	114	/	/X	/
6:00 - 7:00	425	96	521	X/	0	114	/	/X	/
7:00 - 8:00	635	161	796	X/X	0	0	/	/	/
8:00 - 9:00	408	107	515	X/	0	0	/	/	/
9:00 - 10:00	290	103	393	/	0	0	/	/	/
10:00 - 11:00	287	98	385	/	0	0	/	/	/
11:00 - 12:00	313	97	410	/	0	0	/	/	/
12:00 - 13:00	296	99	395	/	0	0	/	/	/
13:00 - 14:00	311	119	430	X/	0	0	/	/	/
14:00 - 15:00	379	144	523	X/	0	0	/	/	/
15:00 - 16:00	510	202	712	X/X	0	0	/	/	/
16:00 - 17:00	590	203	793	X/X	0	156	/	X/X	X/X
17:00 - 18:00	571	241	812	X/X	0	80	/	/X	/X
18:00 - 19:00	397	152	549	X/	0	23	/	/	/
19:00 - 20:00	251	102	353	/	0	0	/	/	/
20:00 - 21:00	199	67	266	/	0	0	/	/	/
21:00 - 22:00	174	66	240	/	0	0	/	/	/
22:00 - 23:00	103	32	135	/	0	0	/	/	/
23:00 - 24:00	54	16	70	/	0	0	/	/	/

	Met (Hr)	Required (Hr)	
Warrant 1	1	8	Not satisfied
Warrant 2	2	8	Not satisfied
Warrant 6	3	8	Not satisfied
Warrant 8	2	8	Not satisfied
Warrant 9	1	4	Not satisfied
Warrant 11	0	1	Not satisfied

LOCATION: I-94 & CSAH-15/MANNING AVE, N RAMPS

COUNTY: WASHINGTON

REF. POINT: 253.681

DATE: 10/1/1996

OPERATOR: RE

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

Speed	Approach Description	Lanes
55	Major App1: MANNING AVE/CSAH-15 NB, S OF N RAMPS OF	3
55	Major App3: CSAH-15 SB (W/O FREE RIGHTS), N OF N RAMP:	3
0	Minor App2: N/A	0
30	Minor App4: I-94 WB RAMP (W/O FREE RIGHT TURNS) TO CS	2

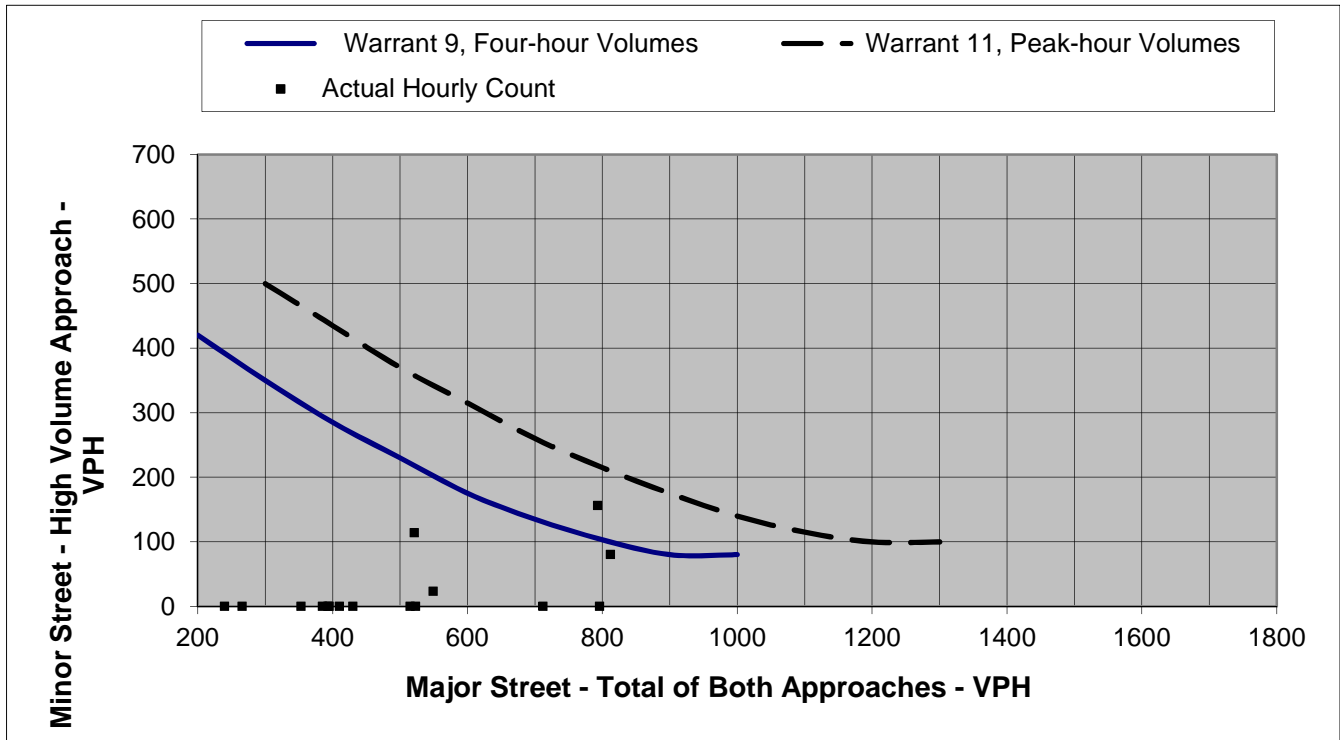


Figure 1. Four Hour and Peak Hour Warrant Analysis

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		35	0
300	350	500	17	0
400	285	435	13	0
500	230	370	17	0
600	175	315	30	79
700	135	260	131	114
800	103	215	521	114
900	80	175	796	0
1000	80	140	515	0
1100		115	393	0
1200		100	385	0
1300		100	410	0
1400			395	0
1500			430	0
1600			523	0
1700			712	0
1800			793	156
			812	80
			549	23
			353	0
			266	0
			240	0
			135	0
			70	0

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-94 & CSAH-15/MANNING AVE, N RAMPS

COUNTY: WASHINGTON

REF. POINT: 253.681

DATE:

OPERATOR: RE

Speed	Approach Description	Lanes
55	Major App1: MANNING AVE/CSAH-15 NB, S OF N RAMPS O	3
55	Major App3: CSAH-15 SB (W/O FREE RIGHTS), N OF N RAM	3
0	Minor App2: N/A	0
30	Minor App4: I-94 WB RAMP (W/O FREE RIGHT TURNS) TO C	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	28	7	0	0	35	0	/
1:00 - 2:00	11	6	0	0	17	0	/
2:00 - 3:00	12	1	0	0	13	0	/
3:00 - 4:00	12	5	0	0	17	0	/
4:00 - 5:00	26	4	0	79	109	79	/
5:00 - 6:00	105	26	0	114	245	114	/
6:00 - 7:00	425	96	0	114	635	114	X/
7:00 - 8:00	635	161	0	0	796	0	X/
8:00 - 9:00	408	107	0	0	515	0	X/
9:00 - 10:00	290	103	0	0	393	0	X/
10:00 - 11:00	287	98	0	0	385	0	X/
11:00 - 12:00	313	97	0	0	410	0	X/
12:00 - 13:00	296	99	0	0	395	0	X/
13:00 - 14:00	311	119	0	0	430	0	X/
14:00 - 15:00	379	144	0	0	523	0	X/
15:00 - 16:00	510	202	0	0	712	0	X/
16:00 - 17:00	590	203	0	156	949	156	X/X
17:00 - 18:00	571	241	0	80	892	80	X/
18:00 - 19:00	397	152	0	23	572	23	X/
19:00 - 20:00	251	102	0	0	353	0	X/
20:00 - 21:00	199	67	0	0	266	0	/
21:00 - 22:00	174	66	0	0	240	0	/
22:00 - 23:00	103	32	0	0	135	0	/
23:00 - 24:00	54	16	0	0	70	0	/

Allway Stop Warrant: Met (Hr) 1 Required (Hr) 8 Not satisfied

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

\_\_\_\_\_

\_\_\_\_\_



# MINNESOTA DEPARTMENT OF TRANSPORTATION

## METRO DIVISION - TRAFFIC ENGINEERING

### TRAFFIC COUNT DATA

ROUTE #: MANNING AVE/CSAH-15 NB, S OF N RAMPS OF I-94

COUNTY: WASHINGTON

REF. PT.: 253.681

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING: **October 1, 1996**

DATE HOUR \ DAY	30 MON.	1 TUE.	2 WED.	3 THU.	4 FRI.	5 SAT.	6 SUN.	AVE. WK.DAY	AVE. WKEND
0:00 - 1:00			18	30	36			28	
1:00 - 2:00			11	10	13			11	
2:00 - 3:00			12	15	10			12	
3:00 - 4:00			8	12	16			12	
4:00 - 5:00			26	29	24			26	
5:00 - 6:00			109	105	103			105	
6:00 - 7:00			432	425	419			425	
7:00 - 8:00			685	640	582			635	
8:00 - 9:00			389	431	406			408	
9:00 - 10:00			296	290	285			290	
10:00 - 11:00			270	305	287			287	
11:00 - 12:00			297	342	302			313	
12:00 - 13:00			276	317				296	
13:00 - 14:00			312	311				311	
14:00 - 15:00			387	372				379	
15:00 - 16:00		535	445	551				510	
16:00 - 17:00		602	584	585				590	
17:00 - 18:00		569	570	575				571	
18:00 - 19:00		402	383	406				397	
19:00 - 20:00		244	251	259				251	
20:00 - 21:00		203	195	200				199	
21:00 - 22:00		166	163	195				174	
22:00 - 23:00		110	104	97				103	
23:00 - 24:00		52	38	73				54	
<b>TOTAL</b>		<b>2883</b>	<b>6261</b>	<b>6575</b>	<b>2483</b>			<b>6387</b>	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> A:\94CR15NR.da1



# MINNESOTA DEPARTMENT OF TRANSPORTATION

## METRO DIVISION - TRAFFIC ENGINEERING

### TRAFFIC COUNT DATA

ROUTE #: N/A  
COUNTY: WASHINGTON  
REF. PT.: 253.681

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:\94CR15NR.da2





# MINNESOTA DEPARTMENT OF TRANSPORTATION

## METRO DIVISION - TRAFFIC ENGINEERING

### TRAFFIC COUNT DATA

ROUTE #: CSAH-15 SB (W/O FREE RIGHTS), N OF N RAMPS OF I-94

COUNTY: WASHINGTON

REF. PT.: 253.681

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING: **October 1, 1996**

DATE HOUR \ DAY	30 MON.	1 TUE.	2 WED.	3 THU.	4 FRI.	5 SAT.	6 SUN.	AVE. WK.DAY	AVE. WKEND
0:00 - 1:00			8	6	8			7	
1:00 - 2:00			6	7	5			6	
2:00 - 3:00			1	2	1			1	
3:00 - 4:00			4	7	6			5	
4:00 - 5:00			5	4	5			4	
5:00 - 6:00			25	32	21			26	
6:00 - 7:00			98	98	93			96	
7:00 - 8:00			167	155	163			161	
8:00 - 9:00			110	118	95			107	
9:00 - 10:00			92	107	112			103	
10:00 - 11:00			106	96	93			98	
11:00 - 12:00			95	92	105			97	
12:00 - 13:00			103	96				99	
13:00 - 14:00			122	116				119	
14:00 - 15:00		146	149	138				144	
15:00 - 16:00		205	215	186				202	
16:00 - 17:00		191	197	223				203	
17:00 - 18:00		239	245	241				241	
18:00 - 19:00		142	163	152				152	
19:00 - 20:00		119	91	96				102	
20:00 - 21:00		67	52	82				67	
21:00 - 22:00		75	44	79				66	
22:00 - 23:00		30	33	33				32	
23:00 - 24:00		18	18	13				16	
<b>TOTAL</b>		<b>1232</b>	<b>2149</b>	<b>2179</b>	<b>707</b>			<b>2154</b>	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> A:\94CR15NR.da3



# MINNESOTA DEPARTMENT OF TRANSPORTATION

## METRO DIVISION - TRAFFIC ENGINEERING

### TRAFFIC COUNT DATA

ROUTE #: I-94 WB RAMP (W/O FREE RIGHT TURNS) TO CSAH-15

COUNTY: WASHINGTON

REF. PT.: 253.681

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING: **October 1, 1996**

DATE HOUR \ DAY	30 MON.	1 TUE.	2 WED.	3 THU.	4 FRI.	5 SAT.	6 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		79						79	
5:00 - 6:00		114						114	
6:00 - 7:00		114						114	
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		156						156	
17:00 - 18:00		80						80	
18:00 - 19:00		23						23	
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
<b>TOTAL</b>		566						566	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> A:\94CR15NR.da4