



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

SIGNAL WARRANTS ANALYSIS

LOCATION: CSAH-15/MANNING AVE & HUDSON RD S.

COUNTY: WASHINGTON

REF. POINT:

DATE: 5/12/1998

OPERATOR: RE

Speed	Approach Description	Lanes
50	Major App1: MANNING AVE/CSAH-15 NB, S OF HUDSON RD S	4
50	Major App3: MANNING AVE/CSAH-15 SB, N OF HUDSON RD S	4
50	Minor App2: HUDSON RD S. EB, W OF MANNING AVE/CSAH-	1
50	Minor App4: HUDSON RD S. WB, E OF MANNING AVE/CSAH-	1

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

HOUR	420/630			105/52		105/52		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	9	24	33	/	2	4	/	/	/
1:00 - 2:00	9	12	21	/	2	2	/	/	/
2:00 - 3:00	9	11	20	/	0	2	/	/	/
3:00 - 4:00	7	7	14	/	1	4	/	/	/
4:00 - 5:00	15	13	28	/	0	9	/	/	/
5:00 - 6:00	65	42	107	/	4	44	/	/	/
6:00 - 7:00	236	175	411	/	11	180	/	X/X	/
7:00 - 8:00	356	279	635	X/X	41	245	/	X/X	X/X
8:00 - 9:00	204	240	444	X/	31	165	/	X/X	X/
9:00 - 10:00	127	182	309	/	25	153	/	X/X	/
10:00 - 11:00	111	158	269	/	28	113	/	X/X	/
11:00 - 12:00	113	195	308	/	38	114	/	X/X	/
12:00 - 13:00	122	201	323	/	52	145	/X	X/X	/
13:00 - 14:00	114	217	331	/	47	135	/	X/X	/
14:00 - 15:00	150	226	376	/	49	119	/	X/X	/
15:00 - 16:00	194	394	588	X/	62	135	/X	X/X	X/
16:00 - 17:00	216	426	642	X/X	81	119	/X	X/X	X/X
17:00 - 18:00	217	407	624	X/	100	135	/X	X/X	X/
18:00 - 19:00	195	298	493	X/	63	79	/X	/X	/
19:00 - 20:00	122	214	336	/	52	66	/X	/X	/
20:00 - 21:00	90	182	272	/	55	50	/X	/	/
21:00 - 22:00	81	132	213	/	29	32	/	/	/
22:00 - 23:00	38	71	109	/	10	15	/	/	/
23:00 - 24:00	21	43	64	/	4	3	/	/	/

	Met (Hr)	Required (Hr)	
Warrant 1	5	8	Not satisfied
Warrant 2	2	8	Not satisfied
Warrant 6	7	8	Not satisfied
Warrant 8	4	8	Not satisfied
Warrant 9	4	4	Satisfied
Warrant 11	1	1	Satisfied

LOCATION: CSAH-15/MANNING AVE & HUDSON RD S.

COUNTY: WASHINGTON

REF. POINT:

DATE: 5/12/1998

OPERATOR: RE

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

Speed	Approach Description	Lanes
50	Major App1: MANNING AVE/CSAH-15 NB, S OF HUDSON RD S	4
50	Major App3: MANNING AVE/CSAH-15 SB, N OF HUDSON RD S	4
50	Minor App2: HUDSON RD S. EB, W OF MANNING AVE/CSAH-	1
50	Minor App4: HUDSON RD S. WB, E OF MANNING AVE/CSAH-1	1

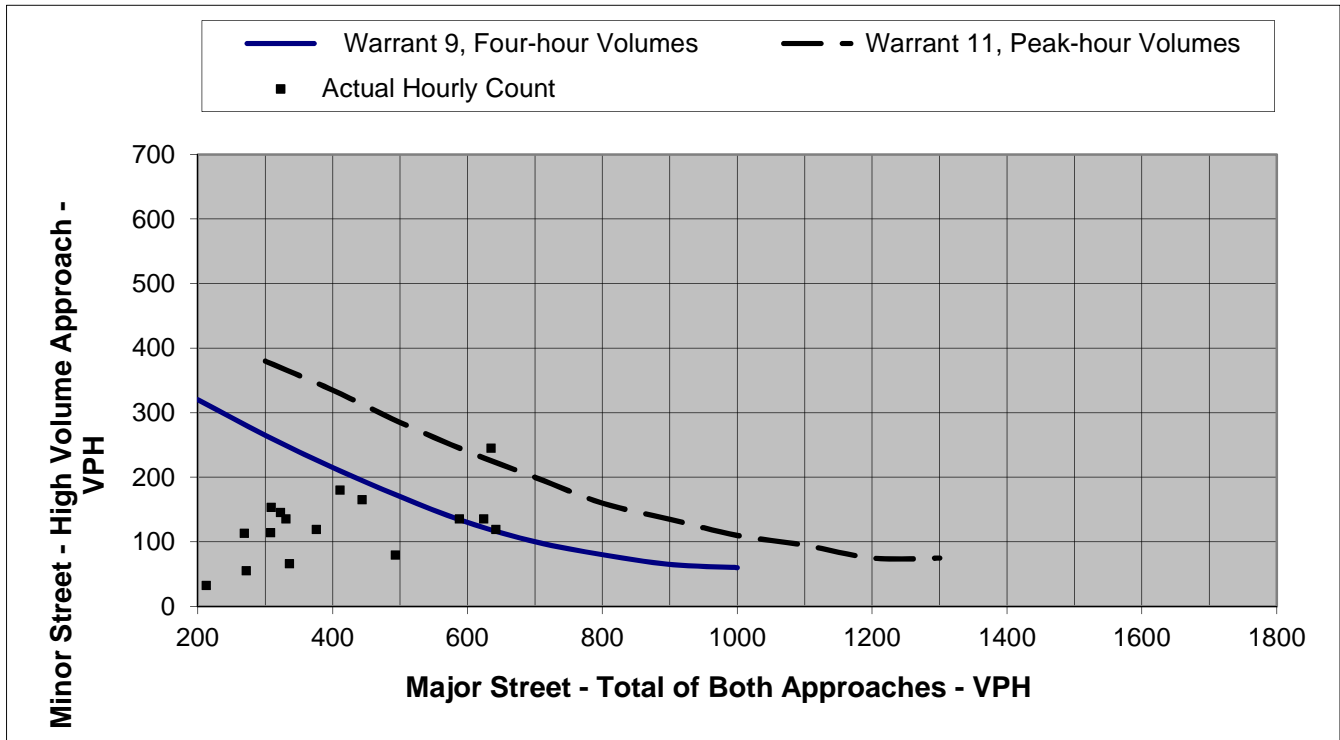


Figure 1. Four Hour and Peak Hour Warrant Analysis

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	320		33	4
300	265	380	21	2
400	215	335	20	2
500	170	285	14	4
600	130	240	28	9
700	100	200	107	44
800	80	160	411	180
900	65	135	635	245
1000	60	110	444	165
1100		95	309	153
1200		75	269	113
1300		75	308	114
1400			323	145
1500			331	135
1600			376	119
1700			588	135
1800			642	119
			624	135
			493	79
			336	66
			272	55
			213	32
			109	15
			64	4

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: CSAH-15/MANNING AVE & HUDSON RD S.

COUNTY: WASHINGTON

REF. POINT:

DATE:

OPERATOR: RE

Speed	Approach Description	Lanes
50	Major App1: MANNING AVE/CSAH-15 NB, S OF HUDSON RD	4
50	Major App3: MANNING AVE/CSAH-15 SB, N OF HUDSON RD	4
50	Minor App2: HUDSON RD S. EB, W OF MANNING AVE/CSAH	1
50	Minor App4: HUDSON RD S. WB, E OF MANNING AVE/CSAH	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	9	24	2	4	39	6	/
1:00 - 2:00	9	12	2	2	25	4	/
2:00 - 3:00	9	11	0	2	22	2	/
3:00 - 4:00	7	7	1	4	19	5	/
4:00 - 5:00	15	13	0	9	37	9	/
5:00 - 6:00	65	42	4	44	155	48	/
6:00 - 7:00	236	175	11	180	602	191	X/X
7:00 - 8:00	356	279	41	245	921	286	X/X
8:00 - 9:00	204	240	31	165	640	196	X/X
9:00 - 10:00	127	182	25	153	487	178	X/X
10:00 - 11:00	111	158	28	113	410	141	X/X
11:00 - 12:00	113	195	38	114	460	152	X/X
12:00 - 13:00	122	201	52	145	520	197	X/X
13:00 - 14:00	114	217	47	135	513	182	X/X
14:00 - 15:00	150	226	49	119	544	168	X/X
15:00 - 16:00	194	394	62	135	785	197	X/X
16:00 - 17:00	216	426	81	119	842	200	X/X
17:00 - 18:00	217	407	100	135	859	235	X/X
18:00 - 19:00	195	298	63	79	635	142	X/X
19:00 - 20:00	122	214	52	66	454	118	X/
20:00 - 21:00	90	182	55	50	377	105	X/
21:00 - 22:00	81	132	29	32	274	61	/
22:00 - 23:00	38	71	10	15	134	25	/
23:00 - 24:00	21	43	4	3	71	7	/

Met (Hr) Required (Hr)

Allway Stop Warrant: **13** 8 **Satisfied**

REMARKS: _____



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: MANNING AVE/CSAH-15 NB, S OF HUDSON RD S.

COUNTY: WASHINGTON

REF. PT.:

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING: **May 12, 1998**

DATE HOUR \ DAY	11 MON.	12 TUE.	13 WED.	14 THU.	15 FRI.	16 SAT.	17 SUN.	AVE. WK.DAY	AVE. WKEND
0:00 - 1:00			10	9				9	
1:00 - 2:00			10	8				9	
2:00 - 3:00			6	13				9	
3:00 - 4:00			10	5				7	
4:00 - 5:00			15	16				15	
5:00 - 6:00			61	70				65	
6:00 - 7:00			234	239				236	
7:00 - 8:00			343	370				356	
8:00 - 9:00			204	204				204	
9:00 - 10:00			134	120				127	
10:00 - 11:00			114	109				111	
11:00 - 12:00		114	118	108				113	
12:00 - 13:00		108	137					122	
13:00 - 14:00		97	131					114	
14:00 - 15:00		148	152					150	
15:00 - 16:00		179	210					194	
16:00 - 17:00		208	225					216	
17:00 - 18:00		222	212					217	
18:00 - 19:00		192	199					195	
19:00 - 20:00		126	118					122	
20:00 - 21:00		76	104					90	
21:00 - 22:00		64	99					81	
22:00 - 23:00		34	42					38	
23:00 - 24:00		19	23					21	
TOTAL		1587	2911	1271				2821	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> A:\CR15HUDS.da1



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: HUDSON RD S. EB, W OF MANNING AVE/CSAH-15

COUNTY: WASHINGTON

REF. PT.:

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING: **May 12, 1998**

DATE HOUR \ DAY	11 MON.	12 TUE.	13 WED.	14 THU.	15 FRI.	16 SAT.	17 SUN.	AVE. WK.DAY	AVE. WKEND
0:00 - 1:00			0	4				2	
1:00 - 2:00			0	4				2	
2:00 - 3:00			0	0				0	
3:00 - 4:00			2	0				1	
4:00 - 5:00			0	0				0	
5:00 - 6:00			5	3				4	
6:00 - 7:00			13	10				11	
7:00 - 8:00			34	48				41	
8:00 - 9:00			30	32				31	
9:00 - 10:00			24	26				25	
10:00 - 11:00			21	36				28	
11:00 - 12:00			40	37				38	
12:00 - 13:00		53	51					52	
13:00 - 14:00		42	52					47	
14:00 - 15:00		52	46					49	
15:00 - 16:00		53	71					62	
16:00 - 17:00		77	86					81	
17:00 - 18:00		106	95					100	
18:00 - 19:00		60	66					63	
19:00 - 20:00		42	62					52	
20:00 - 21:00		56	54					55	
21:00 - 22:00		26	33					29	
22:00 - 23:00		9	12					10	
23:00 - 24:00		5	3					4	
TOTAL		581	800	200				787	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS: _____

CORRECTED AADT: _____

DATA FILE --> A:\CR15HUDS.da2



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: MANNING AVE/CSAH-15 SB, N OF HUDSON RD S.

COUNTY: WASHINGTON

REF. PT.:

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING: **May 18, 1998**

DATE HOUR \ DAY	18 MON.	19 TUE.	20 WED.	21 THU.	22 FRI.	23 SAT.	24 SUN.	AVE. WK.DAY	AVE. WKEND
0:00 - 1:00		17	31					24	
1:00 - 2:00		11	13					12	
2:00 - 3:00		10	13					11	
3:00 - 4:00		7	7					7	
4:00 - 5:00		13	14					13	
5:00 - 6:00		32	52					42	
6:00 - 7:00		161	189					175	
7:00 - 8:00		283	275					279	
8:00 - 9:00		252	229					240	
9:00 - 10:00		203	161					182	
10:00 - 11:00	146	171						158	
11:00 - 12:00	189	202						195	
12:00 - 13:00	196	206						201	
13:00 - 14:00	216	219						217	
14:00 - 15:00	214	239						226	
15:00 - 16:00	408	381						394	
16:00 - 17:00	392	460						426	
17:00 - 18:00	381	433						407	
18:00 - 19:00	289	308						298	
19:00 - 20:00	222	207						214	
20:00 - 21:00	169	195						182	
21:00 - 22:00	110	155						132	
22:00 - 23:00	46	96						71	
23:00 - 24:00	46	40						43	
TOTAL	3024	4301	984					4149	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> A:\CR15HUDS.da3



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: HUDSON RD S. WB, E OF MANNING AVE/CSAH-15

COUNTY: WASHINGTON

REF. PT.:

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING: **May 12, 1998**

DATE HOUR \ DAY	11 MON.	12 TUE.	13 WED.	14 THU.	15 FRI.	16 SAT.	17 SUN.	AVE. WK.DAY	AVE. WKEND
0:00 - 1:00			4	4				4	
1:00 - 2:00			1	3				2	
2:00 - 3:00			1	3				2	
3:00 - 4:00			5	3				4	
4:00 - 5:00			4	15				9	
5:00 - 6:00			47	41				44	
6:00 - 7:00			193	167				180	
7:00 - 8:00			255	235				245	
8:00 - 9:00			169	162				165	
9:00 - 10:00			159	147				153	
10:00 - 11:00			115	112				113	
11:00 - 12:00			109	120				114	
12:00 - 13:00		151	139					145	
13:00 - 14:00		138	132					135	
14:00 - 15:00		108	131					119	
15:00 - 16:00		118	152					135	
16:00 - 17:00		128	111					119	
17:00 - 18:00		134	137					135	
18:00 - 19:00		87	72					79	
19:00 - 20:00		70	62					66	
20:00 - 21:00		48	53					50	
21:00 - 22:00		36	28					32	
22:00 - 23:00		12	18					15	
23:00 - 24:00		3	4					3	
TOTAL		1033	2101	1012				2068	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> A:\CR15HUDS.da4