



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

SIGNAL WARRANTS ANALYSIS

LOCATION: TH-5 & TH-36, NORTH RAMPS

COUNTY: WASHINGTON

REF. POINT: 201.281 (TH-5)

DATE: 3/13/1996

OPERATOR: RE

Speed	Approach Description	Lanes
45	Major App1: TH-5 NB, S OF N RAMPS OF TH-36	2
45	Major App3: WA.CO.RD.5 SB, N OF N RAMPS OF TH-36	2
0	Minor App2: N/A	0
30	Minor App4: TH-36 WB RAMP TO TH-5/CO.RD.5	2

0.70 FACTOR USED? YES

POPULATION < 10,000? NO

EXISTING SIGNAL ? YES

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	50	17	67	/	0	17	/	/	/
1:00 - 2:00	26	14	40	/	0	14	/	/	/
2:00 - 3:00	17	12	29	/	0	8	/	/	/
3:00 - 4:00	22	17	39	/	0	9	/	/	/
4:00 - 5:00	23	49	72	/	0	14	/	/	/
5:00 - 6:00	70	200	270	/	0	48	/	/	/
6:00 - 7:00	135	606	741	X/X	0	131	/	/X	/X
7:00 - 8:00	373	943	1316	X/X	0	213	/	X/X	X/X
8:00 - 9:00	310	481	791	X/X	0	158	/	X/X	X/X
9:00 - 10:00	290	343	633	X/X	0	161	/	X/X	X/X
10:00 - 11:00	272	326	598	X/	0	166	/	X/X	X/
11:00 - 12:00	333	364	697	X/X	0	190	/	X/X	X/X
12:00 - 13:00	365	380	745	X/X	0	201	/	X/X	X/X
13:00 - 14:00	372	337	709	X/X	0	193	/	X/X	X/X
14:00 - 15:00	511	408	919	X/X	0	216	/	X/X	X/X
15:00 - 16:00	761	403	1164	X/X	0	250	/	X/X	X/X
16:00 - 17:00	799	464	1263	X/X	0	292	/	X/X	X/X
17:00 - 18:00	887	504	1391	X/X	0	258	/	X/X	X/X
18:00 - 19:00	536	425	961	X/X	0	187	/	X/X	X/X
19:00 - 20:00	342	296	638	X/X	0	156	/	X/X	X/X
20:00 - 21:00	307	229	536	X/	0	118	/	/X	/
21:00 - 22:00	283	168	451	X/	0	93	/	/X	/
22:00 - 23:00	128	103	231	/	0	43	/	/	/
23:00 - 24:00	85	47	132	/	0	39	/	/	/

	Met (Hr)	Required (Hr)	
Warrant 1	13	8	Satisfied
Warrant 2	13	8	Satisfied
Warrant 6	15	8	Satisfied, check accident record
Warrant 8	15	8	Satisfied
Warrant 9	11	4	Satisfied
Warrant 11	6	1	Satisfied

LOCATION: TH-5 & TH-36, NORTH RAMPS

COUNTY: WASHINGTON

REF. POINT: 201.281 (TH-5)

DATE: 3/13/1996

OPERATOR: RE

0.70 FACTOR USED? YES

POPULATION < 10,000? NO

EXISTING SIGNAL ? YES

Speed	Approach Description	Lanes
45	Major App1: TH-5 NB, S OF N RAMPS OF TH-36	2
45	Major App3: WA.CO.RD.5 SB, N OF N RAMPS OF TH-36	2
0	Minor App2: N/A	0
30	Minor App4: TH-36 WB RAMP TO TH-5/CO.RD.5	2

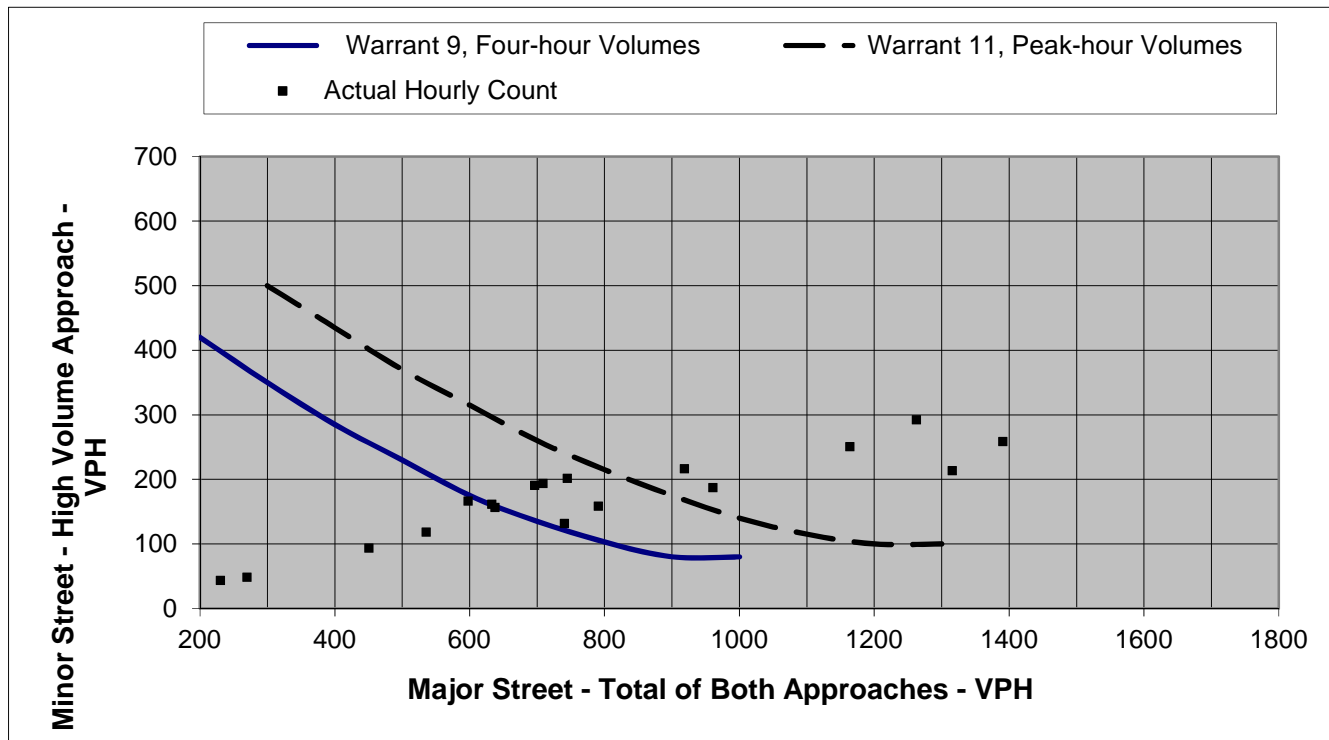


Figure 1. Four Hour and Peak Hour Warrant Analysis

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		67	17
300	350	500	40	14
400	285	435	29	8
500	230	370	39	9
600	175	315	72	14
700	135	260	270	48
800	103	215	741	131
900	80	175	1316	213
1000	80	140	791	158
1100		115	633	161
1200		100	598	166
1300		100	697	190
1400			745	201
1500			709	193
1600			919	216
1700			1164	250
1800			1263	292
			1391	258
			961	187
			638	156
			536	118
			451	93
			231	43
			132	39

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-5 & TH-36, NORTH RAMPS

COUNTY: WASHINGTON

REF. POINT: 201.281 (TH-5)

DATE:

OPERATOR: RE

Speed	Approach Description	Lanes
45	Major App1: TH-5 NB, S OF N RAMPS OF TH-36	2
45	Major App3: WA.CO.RD.5 SB, N OF N RAMPS OF TH-36	2
0	Minor App2: N/A	0
30	Minor App4: TH-36 WB RAMP TO TH-5/CO.RD.5	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	50	17	0	17	84	17	/
1:00 - 2:00	26	14	0	14	54	14	/
2:00 - 3:00	17	12	0	8	37	8	/
3:00 - 4:00	22	17	0	9	48	9	/
4:00 - 5:00	23	49	0	14	86	14	/
5:00 - 6:00	70	200	0	48	318	48	/
6:00 - 7:00	135	606	0	131	872	131	X/
7:00 - 8:00	373	943	0	213	1529	213	X/X
8:00 - 9:00	310	481	0	158	949	158	X/X
9:00 - 10:00	290	343	0	161	794	161	X/X
10:00 - 11:00	272	326	0	166	764	166	X/X
11:00 - 12:00	333	364	0	190	887	190	X/X
12:00 - 13:00	365	380	0	201	946	201	X/X
13:00 - 14:00	372	337	0	193	902	193	X/X
14:00 - 15:00	511	408	0	216	1135	216	X/X
15:00 - 16:00	761	403	0	250	1414	250	X/X
16:00 - 17:00	799	464	0	292	1555	292	X/X
17:00 - 18:00	887	504	0	258	1649	258	X/X
18:00 - 19:00	536	425	0	187	1148	187	X/X
19:00 - 20:00	342	296	0	156	794	156	X/X
20:00 - 21:00	307	229	0	118	654	118	X/
21:00 - 22:00	283	168	0	93	544	93	X/
22:00 - 23:00	128	103	0	43	274	43	/
23:00 - 24:00	85	47	0	39	171	39	/

Met (Hr) Required (Hr)

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

REMARKS: _____



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: TH-5 NB, S OF N RAMPS OF TH-36

COUNTY: WASHINGTON

REF. PT.: 201.281 (TH-5)

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING: **March 13, 1996**

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				43	57			50	
1:00 - 2:00				22	31			26	
2:00 - 3:00				16	19			17	
3:00 - 4:00				16	28			22	
4:00 - 5:00				24	22			23	
5:00 - 6:00				73	68			70	
6:00 - 7:00				142	129			135	
7:00 - 8:00				370	376			373	
8:00 - 9:00				306	314			310	
9:00 - 10:00				266	314			290	
10:00 - 11:00			252	263	302			272	
11:00 - 12:00			272	354	375			333	
12:00 - 13:00			337	355	404			365	
13:00 - 14:00			369	376				372	
14:00 - 15:00			505	518				511	
15:00 - 16:00			766	756				761	
16:00 - 17:00			813	785				799	
17:00 - 18:00			857	917				887	
18:00 - 19:00			500	573				536	
19:00 - 20:00			334	350				342	
20:00 - 21:00			297	317				307	
21:00 - 22:00			273	294				283	
22:00 - 23:00			128	129				128	
23:00 - 24:00			83	87				85	
TOTAL			5786	7352	2439			7297	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> A:\TH5&36NR.da1



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: N/A
 COUNTY: WASHINGTON
 REF. PT.: 201.281 (TH-5)

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:\TH5&36NR.da2



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: WA.CO.RD.5 SB, N OF N RAMPS OF TH-36

COUNTY: WASHINGTON

REF. PT.: 201.281 (TH-5)

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING: **March 13, 1996**

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				18	16			17	
1:00 - 2:00				11	18			14	
2:00 - 3:00				15	10			12	
3:00 - 4:00				19	16			17	
4:00 - 5:00				54	45			49	
5:00 - 6:00				204	196			200	
6:00 - 7:00				618	594			606	
7:00 - 8:00				922	964			943	
8:00 - 9:00				476	487			481	
9:00 - 10:00				328	358			343	
10:00 - 11:00			304	304	371			326	
11:00 - 12:00			319	374	401			364	
12:00 - 13:00			379	382				380	
13:00 - 14:00			336	338				337	
14:00 - 15:00			403	414				408	
15:00 - 16:00			390	417				403	
16:00 - 17:00			464	465				464	
17:00 - 18:00			512	496				504	
18:00 - 19:00			399	452				425	
19:00 - 20:00			272	320				296	
20:00 - 21:00			231	228				229	
21:00 - 22:00			177	159				168	
22:00 - 23:00			95	111				103	
23:00 - 24:00			46	49				47	
TOTAL			4327	7174	3476			7136	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> A:\TH5&36NR.da3



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: TH-36 WB RAMP TO TH-5/CO.RD.5

COUNTY: WASHINGTON

REF. PT.: 201.281 (TH-5)

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING: **March 12, 1996**

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			16	18	18			17	
1:00 - 2:00			13	10	19			14	
2:00 - 3:00			9	7	8			8	
3:00 - 4:00			11	7	9			9	
4:00 - 5:00			15	14	15			14	
5:00 - 6:00			49	47	49			48	
6:00 - 7:00			145	115	134			131	
7:00 - 8:00			207	210	223			213	
8:00 - 9:00			144	163	167			158	
9:00 - 10:00			152	158	175			161	
10:00 - 11:00			162	147	191			166	
11:00 - 12:00			161	188	223			190	
12:00 - 13:00		214	182	208				201	
13:00 - 14:00		171	224	184				193	
14:00 - 15:00		205	232	211				216	
15:00 - 16:00		254	242	256				250	
16:00 - 17:00		290	270	316				292	
17:00 - 18:00		273	269	233				258	
18:00 - 19:00		196	185	182				187	
19:00 - 20:00		155	161	153				156	
20:00 - 21:00		104	130	121				118	
21:00 - 22:00		108	81	92				93	
22:00 - 23:00		44	47	40				43	
23:00 - 24:00		39	45	34				39	
TOTAL		2053	3152	3114	1231			3175	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> A:\TH5&36NR.da4