



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

SIGNAL WARRANTS ANALYSIS

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

COUNTY: WASHINGTON

REF. POINT: 201.233 (TH-5)

DATE: 3/13/1996

OPERATOR: RE

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

0.70 FACTOR USED? YES

POPULATION < 10,000? NO

EXISTING SIGNAL ? YES

HOUR	420/630			140/70			0/0		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	44	24	68	/	22	0	/	/	/
1:00 - 2:00	25	20	45	/	13	0	/	/	/
2:00 - 3:00	15	11	26	/	11	0	/	/	/
3:00 - 4:00	28	15	43	/	5	0	/	/	/
4:00 - 5:00	25	41	66	/	9	0	/	/	/
5:00 - 6:00	70	170	240	/	33	0	/	/	/
6:00 - 7:00	199	473	672	X/X	91	0	/X	/	/X
7:00 - 8:00	513	874	1387	X/X	242	0	X/X	/	X/X
8:00 - 9:00	398	436	834	X/X	141	0	X/X	/	X/X
9:00 - 10:00	366	333	699	X/X	129	0	/X	/	/X
10:00 - 11:00	368	323	691	X/X	133	0	/X	/	/X
11:00 - 12:00	420	372	792	X/X	161	0	X/X	/	X/X
12:00 - 13:00	462	401	863	X/X	158	0	X/X	/	X/X
13:00 - 14:00	447	374	821	X/X	184	0	X/X	/	X/X
14:00 - 15:00	595	459	1054	X/X	208	0	X/X	/	X/X
15:00 - 16:00	829	463	1292	X/X	290	0	X/X	/	X/X
16:00 - 17:00	832	522	1354	X/X	336	0	X/X	/	X/X
17:00 - 18:00	873	535	1408	X/X	374	0	X/X	/	X/X
18:00 - 19:00	545	430	975	X/X	268	0	X/X	/	X/X
19:00 - 20:00	337	298	635	X/X	189	0	X/X	/	X/X
20:00 - 21:00	292	241	533	X/	138	0	/X	/	/
21:00 - 22:00	254	170	424	X/	123	0	/X	/	/
22:00 - 23:00	111	92	203	/	61	0	/	/	/
23:00 - 24:00	76	54	130	/	40	0	/	/	/

	Met (Hr)	Required (Hr)	
Warrant 1	11	8	Satisfied
Warrant 2	14	8	Satisfied
Warrant 6	16	8	Satisfied, check accident record
Warrant 8	14	8	Satisfied
Warrant 9	11	4	Satisfied
Warrant 11	6	1	Satisfied

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COUNTY: WASHINGTON

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OPERATOR: RE

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

0.70 FACTOR USED? YES

POPULATION < 10,000? NO

EXISTING SIGNAL ? YES

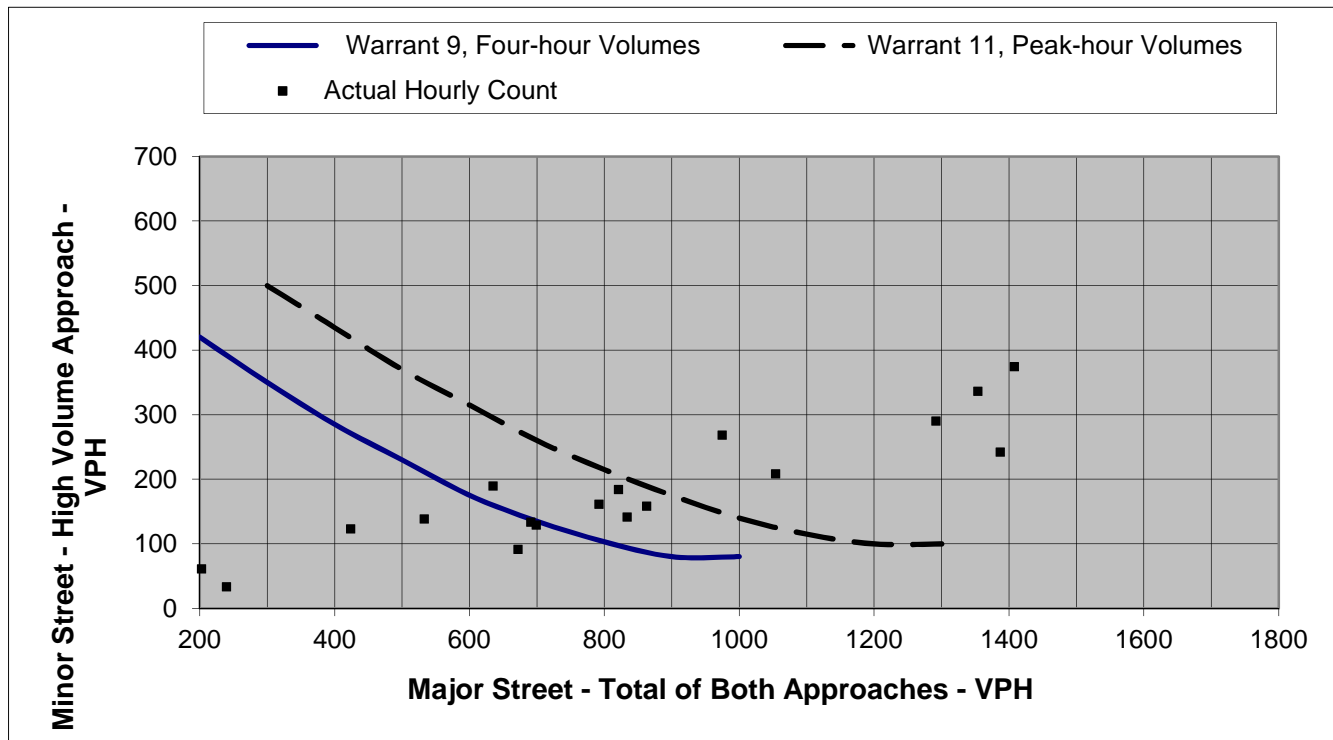


Figure 1. Four Hour and Peak Hour Warrant Analysis

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		68	22
300	350	500	45	13
400	285	435	26	11
500	230	370	43	5
600	175	315	66	9
700	135	260	240	33
800	103	215	672	91
900	80	175	1387	242
1000	80	140	834	141
1100		115	699	129
1200		100	691	133
1300		100	792	161
1400			863	158
1500			821	184
1600			1054	208
1700			1292	290
1800			1354	336
			1408	374
			975	268
			635	189
			533	138
			424	123
			203	61
			130	40

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, SOUTH RAMPS

COUNTY: WASHINGTON

REF. POINT: 201.233 (TH-5)

DATE:

OPERATOR: RE

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

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	44	24	22	0	90	22	/
1:00 - 2:00	25	20	13	0	58	13	/
2:00 - 3:00	15	11	11	0	37	11	/
3:00 - 4:00	28	15	5	0	48	5	/
4:00 - 5:00	25	41	9	0	75	9	/
5:00 - 6:00	70	170	33	0	273	33	/
6:00 - 7:00	199	473	91	0	763	91	X/
7:00 - 8:00	513	874	242	0	1629	242	X/X
8:00 - 9:00	398	436	141	0	975	141	X/X
9:00 - 10:00	366	333	129	0	828	129	X/
10:00 - 11:00	368	323	133	0	824	133	X/
11:00 - 12:00	420	372	161	0	953	161	X/X
12:00 - 13:00	462	401	158	0	1021	158	X/X
13:00 - 14:00	447	374	184	0	1005	184	X/X
14:00 - 15:00	595	459	208	0	1262	208	X/X
15:00 - 16:00	829	463	290	0	1582	290	X/X
16:00 - 17:00	832	522	336	0	1690	336	X/X
17:00 - 18:00	873	535	374	0	1782	374	X/X
18:00 - 19:00	545	430	268	0	1243	268	X/X
19:00 - 20:00	337	298	189	0	824	189	X/X
20:00 - 21:00	292	241	138	0	671	138	X/
21:00 - 22:00	254	170	123	0	547	123	X/
22:00 - 23:00	111	92	61	0	264	61	/
23:00 - 24:00	76	54	40	0	170	40	/

Met (Hr) Required (Hr)

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

REMARKS: _____



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

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

COUNTY: WASHINGTON

REF. PT.: 201.233 (TH-5)

SITE CODE: APPRAOCH

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				38	51			44	
1:00 - 2:00				21	29			25	
2:00 - 3:00				12	18			15	
3:00 - 4:00				24	33			28	
4:00 - 5:00				27	24			25	
5:00 - 6:00				73	68			70	
6:00 - 7:00				214	185			199	
7:00 - 8:00				495	531			513	
8:00 - 9:00				372	424			398	
9:00 - 10:00				345	387			366	
10:00 - 11:00				353	384			368	
11:00 - 12:00			377	433	450			420	
12:00 - 13:00			428	447	511			462	
13:00 - 14:00			441	454				447	
14:00 - 15:00			597	594				595	
15:00 - 16:00			802	857				829	
16:00 - 17:00			831	834				832	
17:00 - 18:00			863	883				873	
18:00 - 19:00			524	567				545	
19:00 - 20:00			346	328				337	
20:00 - 21:00			260	325				292	
21:00 - 22:00			223	285				254	
22:00 - 23:00			103	120				111	
23:00 - 24:00			76	76				76	
TOTAL			5871	8177	3095			8124	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

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



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

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

COUNTY: WASHINGTON

REF. PT.: 201.233 (TH-5)

SITE CODE: APPRAOCH

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			18	27	22			22	
1:00 - 2:00			10	10	19			13	
2:00 - 3:00			11	10	13			11	
3:00 - 4:00			5	3	7			5	
4:00 - 5:00			6	10	11			9	
5:00 - 6:00			27	36	36			33	
6:00 - 7:00			87	89	97			91	
7:00 - 8:00			260	227	241			242	
8:00 - 9:00			133	158	133			141	
9:00 - 10:00			112	125	151			129	
10:00 - 11:00			126	120	155			133	
11:00 - 12:00			139	168	177			161	
12:00 - 13:00		148	175	151				158	
13:00 - 14:00		184	171	198				184	
14:00 - 15:00		203	196	226				208	
15:00 - 16:00		283	303	285				290	
16:00 - 17:00		332	343	333				336	
17:00 - 18:00		375	358	390				374	
18:00 - 19:00		292	224	288				268	
19:00 - 20:00		249	156	163				189	
20:00 - 21:00		148	143	125				138	
21:00 - 22:00		137	127	106				123	
22:00 - 23:00		71	59	55				61	
23:00 - 24:00		44	37	41				40	
TOTAL		2466	3226	3344	1062			3359	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> A:\TH5&36SR.da2



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

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

COUNTY: WASHINGTON

REF. PT.: 201.233 (TH-5)

SITE CODE: APPRAOCH

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				25	24			24	
1:00 - 2:00				17	24			20	
2:00 - 3:00				11	12			11	
3:00 - 4:00				15	16			15	
4:00 - 5:00				43	39			41	
5:00 - 6:00				175	166			170	
6:00 - 7:00				474	473			473	
7:00 - 8:00				856	893			874	
8:00 - 9:00				431	441			436	
9:00 - 10:00				323	344			333	
10:00 - 11:00			318	296	355			323	
11:00 - 12:00			324	375	418			372	
12:00 - 13:00			387	394	424			401	
13:00 - 14:00			405	344				374	
14:00 - 15:00			454	465				459	
15:00 - 16:00			450	477				463	
16:00 - 17:00			492	552				522	
17:00 - 18:00			561	510				535	
18:00 - 19:00			418	442				430	
19:00 - 20:00			288	309				298	
20:00 - 21:00			238	245				241	
21:00 - 22:00			169	171				170	
22:00 - 23:00			89	95				92	
23:00 - 24:00			58	50				54	
TOTAL			4651	7095	3629			7131	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS: _____

CORRECTED AADT: _____

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



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: N/A
 COUNTY: WASHINGTON
 REF. PT.: 201.233 (TH-5)

SITE CODE: APPRAOCH

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&36SR.da4