



# MINNESOTA DEPARTMENT OF TRANSPORTATION

## METRO DIVISION - TRAFFIC ENGINEERING

### SIGNAL WARRANTS ANALYSIS

LOCATION: TH-10 AT ARMSTRONG BLVD

COUNTY: ANOKA

REF. POINT: 220+00.290

DATE: 8/3/1995

OPERATOR: DR

Speed	Approach Description	Lanes
55	Major App1: TH-10 EB, W OF ARMSTRONG BLVD	4
55	Major App3: TH-10 WB, E OF ARMSTRONG BLVD	4
30	Minor App2: ARMSTRONG BLVD NR, S OF TH-10	2
55	Minor App4: ARMSTRONG BLVD SB, N OF TH-10	2

0.70 FACTOR USED? YES

POPULATION < 10,000? NO

EXISTING SIGNAL ? NO

HOUR	420/630				140/70		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	102	173	275	/	2	15	/	/	/
1:00 - 2:00	38	86	124	/	2	9	/	/	/
2:00 - 3:00	39	103	142	/	0	8	/	/	/
3:00 - 4:00	78	60	138	/	1	12	/	/	/
4:00 - 5:00	146	76	222	/	3	42	/	/	/
5:00 - 6:00	494	187	681	X/X	3	193	/	X/X	X/X
6:00 - 7:00	1277	442	1719	X/X	12	297	/	X/X	X/X
7:00 - 8:00	1113	709	1822	X/X	20	247	/	X/X	X/X
8:00 - 9:00	775	638	1413	X/X	23	152	/	X/X	X/X
9:00 - 10:00	659	690	1349	X/X	16	109	/	/X	/X
10:00 - 11:00	706	698	1404	X/X	18	107	/	/X	/X
11:00 - 12:00	712	807	1519	X/X	21	104	/	/X	/X
12:00 - 13:00	713	795	1508	X/X	20	106	/	/X	/X
13:00 - 14:00	837	772	1609	X/X	22	121	/	/X	/X
14:00 - 15:00	977	924	1901	X/X	20	120	/	/X	/X
15:00 - 16:00	867	1482	2349	X/X	23	105	/	/X	/X
16:00 - 17:00	909	1567	2476	X/X	19	109	/	/X	/X
17:00 - 18:00	916	1496	2412	X/X	24	119	/	/X	/X
18:00 - 19:00	731	1118	1849	X/X	19	129	/	/X	/X
19:00 - 20:00	568	774	1342	X/X	28	107	/	/X	/X
20:00 - 21:00	487	685	1172	X/X	18	86	/	/X	/X
21:00 - 22:00	444	610	1054	X/X	10	78	/	/X	/X
22:00 - 23:00	360	371	731	X/X	6	63	/	/	/
23:00 - 24:00	163	351	514	X/	5	25	/	/	/

	Met (Hr)	Required (Hr)	
Warrant 1	4	8	Not satisfied
Warrant 2	17	8	Satisfied
Warrant 6	18	8	Satisfied, check accident record
Warrant 8	8	8	Satisfied
Warrant 9	16	4	Satisfied
Warrant 11	14	1	Satisfied

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OPERATOR: DR

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

Speed	Approach Description	Lanes
55	Major App1: TH-10 EB, W OF ARMSTRONG BLVD	4
55	Major App3: TH-10 WB, E OF ARMSTRONG BLVD	4
30	Minor App2: ARMSTRONG BLVD NR, S OF TH-10	2
55	Minor App4: ARMSTRONG BLVD SB, N OF TH-10	2

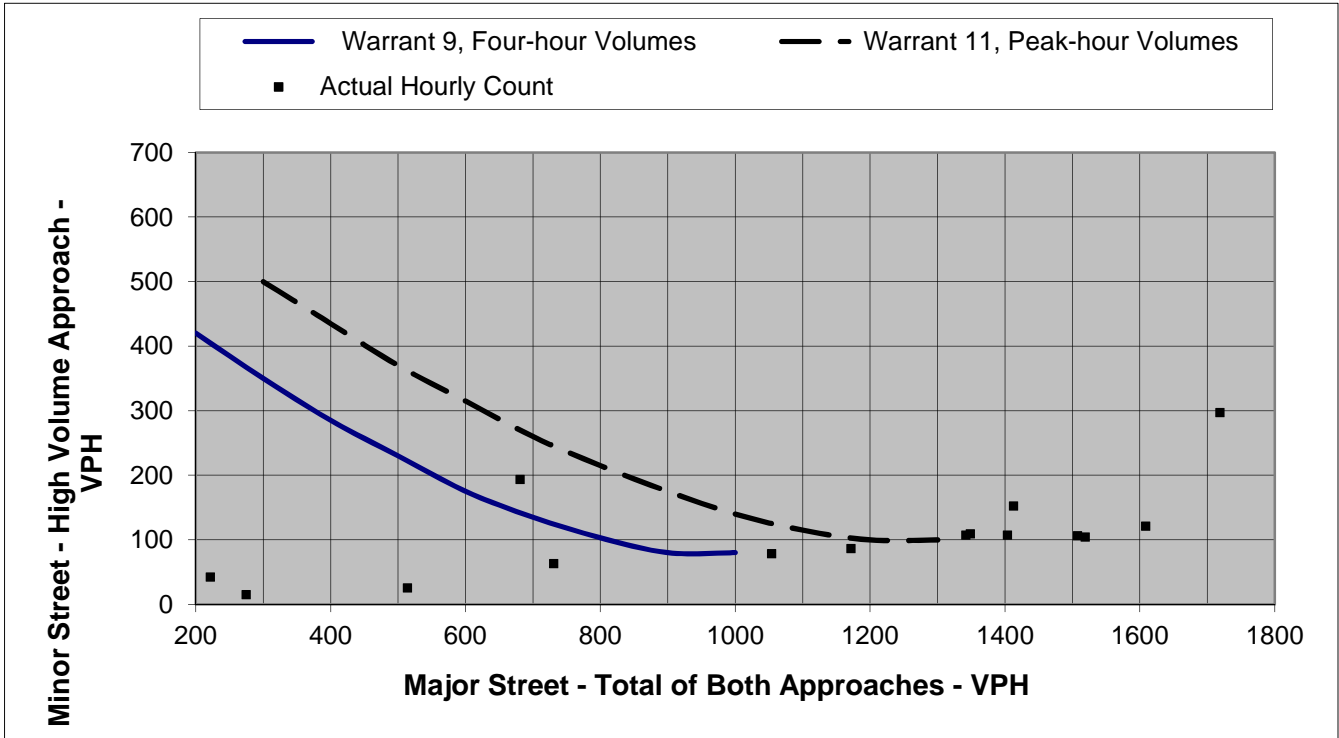


Figure 1. Four Hour and Peak Hour Warrant Analysis

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		275	15
300	350	500	124	9
400	285	435	142	8
500	230	370	138	12
600	175	315	222	42
700	135	260	681	193
800	103	215	1719	297
900	80	175	1822	247
1000	80	140	1413	152
1100		115	1349	109
1200		100	1404	107
1300		100	1519	104
1400			1508	106
1500			1609	121
1600			1901	120
1700			2349	105
1800			2476	109
			2412	119
			1849	129
			1342	107
			1172	86
			1054	78
			731	63
			514	25

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-10 AT ARMSTRONG BLVD

COUNTY: ANOKA

REF. POINT: 220+00.290

DATE: 8/3/1995

OPERATOR: DR

Speed	Approach Description	Lanes
55	Major App1: TH-10 EB, W OF ARMSTRONG BLVD	4
55	Major App3: TH-10 WB, E OF ARMSTRONG BLVD	4
30	Minor App2: ARMSTRONG BLVD NR, S OF TH-10	2
55	Minor App4: ARMSTRONG BLVD SB, N OF TH-10	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	102	173	2	15	292	17	/
1:00 - 2:00	38	86	2	9	135	11	/
2:00 - 3:00	39	103	0	8	150	8	/
3:00 - 4:00	78	60	1	12	151	13	/
4:00 - 5:00	146	76	3	42	267	45	/
5:00 - 6:00	494	187	3	193	877	196	X/X
6:00 - 7:00	1277	442	12	297	2028	309	X/X
7:00 - 8:00	1113	709	20	247	2089	267	X/X
8:00 - 9:00	775	638	23	152	1588	175	X/X
9:00 - 10:00	659	690	16	109	1474	125	X/
10:00 - 11:00	706	698	18	107	1529	125	X/
11:00 - 12:00	712	807	21	104	1644	125	X/
12:00 - 13:00	713	795	20	106	1634	126	X/
13:00 - 14:00	837	772	22	121	1752	143	X/X
14:00 - 15:00	977	924	20	120	2041	140	X/X
15:00 - 16:00	867	1482	23	105	2477	128	X/
16:00 - 17:00	909	1567	19	109	2604	128	X/
17:00 - 18:00	916	1496	24	119	2555	143	X/X
18:00 - 19:00	731	1118	19	129	1997	148	X/X
19:00 - 20:00	568	774	28	107	1477	135	X/
20:00 - 21:00	487	685	18	86	1276	104	X/
21:00 - 22:00	444	610	10	78	1142	88	X/
22:00 - 23:00	360	371	6	63	800	69	X/
23:00 - 24:00	163	351	5	25	544	30	X/

Met (Hr) Required (Hr)

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

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

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