



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

SIGNAL WARRANTS ANALYSIS

LOCATION: TH 47 @ 229th ST. IN ST FRANCIS

COUNTY: ANOKA

REF. POINT: 034+576

DATE: 9/11/2000

OPERATOR: M.A.R.

Speed	Approach Description	Lanes
55	Major App1: TH 47 SOUTH BOUND	3
55	Major App3: TH 47 NORTH BOUND	3
30	Minor App2: 229th ST. WEST BOUND	2
0	Minor App4: 0	0

0.70 FACTOR USED? YES

POPULATION < 10,000? YES

EXISTING SIGNAL ? NO

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	12	30	42	/	2	0	/	/	/
1:00 - 2:00	9	17	26	/	1	0	/	/	/
2:00 - 3:00	11	25	36	/	1	0	/	/	/
3:00 - 4:00	33	18	51	/	1	0	/	/	/
4:00 - 5:00	132	13	145	/	2	0	/	/	/
5:00 - 6:00	422	32	454	X/	19	0	/	/	/
6:00 - 7:00	468	92	560	X/	36	0	/	/	/
7:00 - 8:00	427	185	612	X/	77	0	/X	/	/
8:00 - 9:00	242	123	365	/	38	0	/	/	/
9:00 - 10:00	188	131	319	/	37	0	/	/	/
10:00 - 11:00	145	103	248	/	27	0	/	/	/
11:00 - 12:00	127	127	254	/	43	0	/	/	/
12:00 - 13:00	144	139	283	/	50	0	/	/	/
13:00 - 14:00	161	152	313	/	70	0	/X	/	/
14:00 - 15:00	176	234	410	/	95	0	/X	/	/
15:00 - 16:00	181	405	586	X/	101	0	/X	/	/
16:00 - 17:00	182	465	647	X/X	56	0	/	/	/
17:00 - 18:00	152	432	584	X/	192	0	X/X	/	X/
18:00 - 19:00	151	327	478	X/	70	0	/X	/	/
19:00 - 20:00	101	225	326	/	43	0	/	/	/
20:00 - 21:00	84	162	246	/	18	0	/	/	/
21:00 - 22:00	85	135	220	/	10	0	/	/	/
22:00 - 23:00	56	76	132	/	8	0	/	/	/
23:00 - 24:00	15	73	88	/	2	0	/	/	/

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

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55	Major App1: TH 47 SOUTH BOUND	3
55	Major App3: TH 47 NORTH BOUND	3
30	Minor App2: 229th ST. WEST BOUND	2
0	Minor App4: 0	0

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

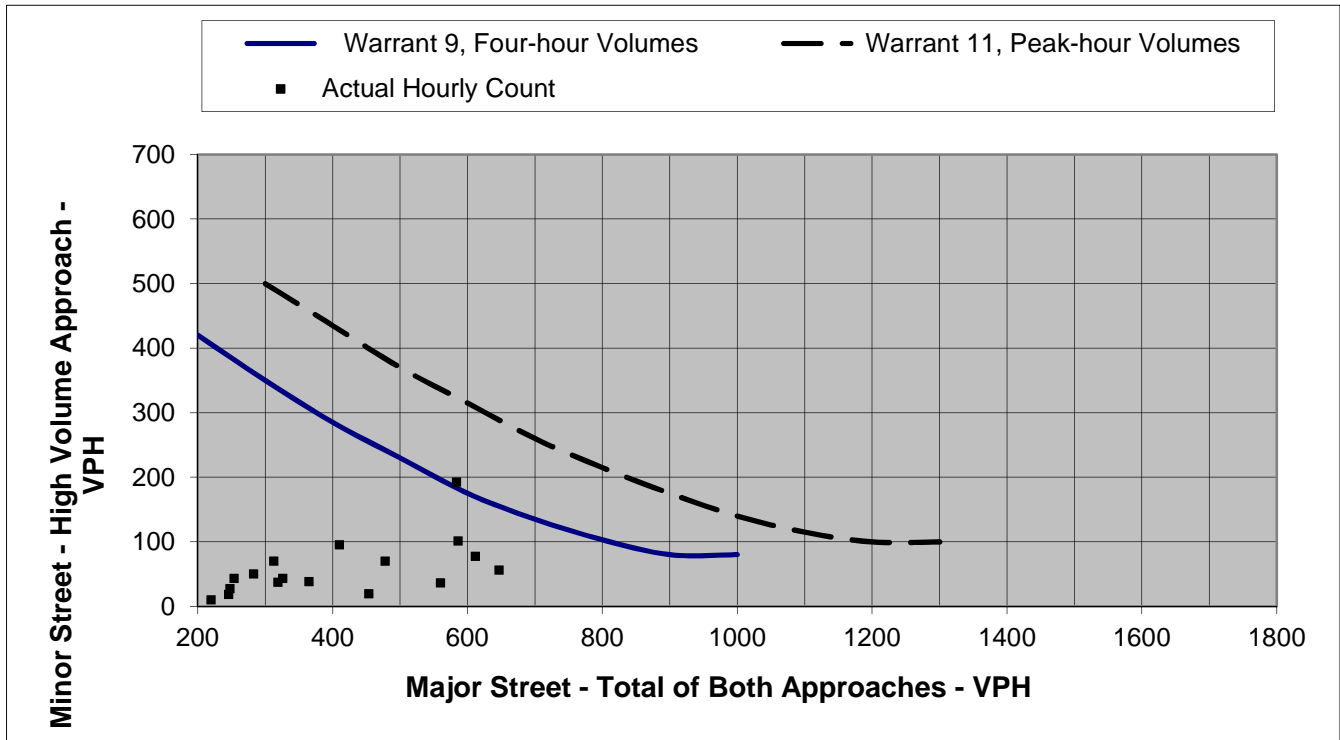


Figure 1. Four Hour and Peak Hour Warrant Analysis

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		42	2
300	350	500	26	1
400	285	435	36	1
500	230	370	51	1
600	175	315	145	2
700	135	260	454	19
800	103	215	560	36
900	80	175	612	77
1000	80	140	365	38
1100		115	319	37
1200		100	248	27
1300		100	254	43
1400			283	50
1500			313	70
1600			410	95
1700			586	101
1800			647	56
			584	192
			478	70
			326	43
			246	18
			220	10
			132	8
			88	2

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 47 @ 229th ST. IN ST FRANCIS

COUNTY: ANOKA

REF. POINT: 034+576

DATE: 9/11/2000

OPERATOR: M.A.R.

Speed	Approach Description	Lanes
55	Major App1: TH 47 SOUTH BOUND	3
55	Major App3: TH 47 NORTH BOUND	3
30	Minor App2: 229th ST. WEST BOUND	2
0	Minor App4: 0	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	12	30	2	0	44	2	/
1:00 - 2:00	9	17	1	0	27	1	/
2:00 - 3:00	11	25	1	0	37	1	/
3:00 - 4:00	33	18	1	0	52	1	/
4:00 - 5:00	132	13	2	0	147	2	/
5:00 - 6:00	422	32	19	0	473	19	X/
6:00 - 7:00	468	92	36	0	596	36	X/
7:00 - 8:00	427	185	77	0	689	77	X/
8:00 - 9:00	242	123	38	0	403	38	X/
9:00 - 10:00	188	131	37	0	356	37	X/
10:00 - 11:00	145	103	27	0	275	27	/
11:00 - 12:00	127	127	43	0	297	43	/
12:00 - 13:00	144	139	50	0	333	50	/
13:00 - 14:00	161	152	70	0	383	70	X/
14:00 - 15:00	176	234	95	0	505	95	X/
15:00 - 16:00	181	405	101	0	687	101	X/
16:00 - 17:00	182	465	56	0	703	56	X/
17:00 - 18:00	152	432	192	0	776	192	X/X
18:00 - 19:00	151	327	70	0	548	70	X/
19:00 - 20:00	101	225	43	0	369	43	X/
20:00 - 21:00	84	162	18	0	264	18	/
21:00 - 22:00	85	135	10	0	230	10	/
22:00 - 23:00	56	76	8	0	140	8	/
23:00 - 24:00	15	73	2	0	90	2	/

Met (Hr) Required (Hr)

Allway Stop Warrant: 1 8 Not satisfied

REMARKS: _____



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: TH 47 SOUTH BOUND

COUNTY: ANOKA

REF. PT.: 034+576

SITE CODE: 24947229

OPERATOR: M.A.R.

FOR COUNTS BEGINNING: **September 11, 2000**

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	14					12	
1:00 - 2:00		8	10					9	
2:00 - 3:00		12	11					11	
3:00 - 4:00		32	34					33	
4:00 - 5:00		136	128					132	
5:00 - 6:00		428	417					422	
6:00 - 7:00		470	466					468	
7:00 - 8:00		427	428					427	
8:00 - 9:00		222	262					242	
9:00 - 10:00		184	193					188	
10:00 - 11:00		136	155					145	
11:00 - 12:00		130	125					127	
12:00 - 13:00		127	161					144	
13:00 - 14:00	155	167						161	
14:00 - 15:00	176	176						176	
15:00 - 16:00	156	207						181	
16:00 - 17:00	174	190						182	
17:00 - 18:00	140	164						152	
18:00 - 19:00	147	156						151	
19:00 - 20:00	101	102						101	
20:00 - 21:00	74	94						84	
21:00 - 22:00	90	80						85	
22:00 - 23:00	48	64						56	
23:00 - 24:00	16	15						15	
TOTAL	1277	3737	2404					3704	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> a:\24947005



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: 229th ST. WEST BOUND

COUNTY: ANOKA

REF. PT.: 034+576

SITE CODE: 24947229

OPERATOR: M.A.R.

FOR COUNTS BEGINNING: **September 11, 2000**

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		1	3					2	
1:00 - 2:00		1	1					1	
2:00 - 3:00		1	2					1	
3:00 - 4:00		0	2					1	
4:00 - 5:00		3	2					2	
5:00 - 6:00		18	21					19	
6:00 - 7:00		35	37					36	
7:00 - 8:00		74	80					77	
8:00 - 9:00		40	37					38	
9:00 - 10:00		34	41					37	
10:00 - 11:00		26	28					27	
11:00 - 12:00		41	45					43	
12:00 - 13:00		19	81					50	
13:00 - 14:00	64	76						70	
14:00 - 15:00	62	128						95	
15:00 - 16:00	117	85						101	
16:00 - 17:00	76	37						56	
17:00 - 18:00	341	44						192	
18:00 - 19:00	84	57						70	
19:00 - 20:00	24	63						43	
20:00 - 21:00	14	23						18	
21:00 - 22:00	11	9						10	
22:00 - 23:00	4	12						8	
23:00 - 24:00	1	3						2	
TOTAL	798	830	380					999	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS: _____

CORRECTED AADT: _____

DATA FILE --> a:\24922903



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: TH 47 NORTH BOUND

COUNTY: ANOKA

REF. PT.: 034+576

SITE CODE: 24947229

OPERATOR: M.A.R.

FOR COUNTS BEGINNING: **September 11, 2000**

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		36	25					30	
1:00 - 2:00		15	20					17	
2:00 - 3:00		23	28					25	
3:00 - 4:00		21	16					18	
4:00 - 5:00		11	15					13	
5:00 - 6:00		30	34					32	
6:00 - 7:00		85	99					92	
7:00 - 8:00		186	185					185	
8:00 - 9:00		122	124					123	
9:00 - 10:00		131	132					131	
10:00 - 11:00		102	105					103	
11:00 - 12:00		123	132					127	
12:00 - 13:00		113	165					139	
13:00 - 14:00	141	163						152	
14:00 - 15:00	203	266						234	
15:00 - 16:00	363	448						405	
16:00 - 17:00	435	496						465	
17:00 - 18:00	408	456						432	
18:00 - 19:00	336	319						327	
19:00 - 20:00	211	239						225	
20:00 - 21:00	148	177						162	
21:00 - 22:00	118	152						135	
22:00 - 23:00	74	78						76	
23:00 - 24:00	71	76						73	
TOTAL	2508	3868	1080					3721	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> a:\24947001



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #:

COUNTY:

REF. PT.:

SITE CODE:

OPERATOR:

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 -->