



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

SIGNAL WARRANTS ANALYSIS

LOCATION: TH 610 @ EAST RIVER RD NORTH RAMP

COUNTY: ANOKA

REF. POINT: 1+00.239

DATE: 9/11/2000

OPERATOR: M.A.R.

Speed	Approach Description	Lanes
55	Major App1: EAST RIVER RD (TH 1) S.B.	4
55	Major App3: EAST RIVER RD (TH 1) N.B.	4
45	Minor App2: FOLEY BLVD W.B.	3
0	Minor App4: 0	0

0.70 FACTOR USED? YES

POPULATION < 10,000? YES

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	42	22	64	/	108	0	/X	/	/
1:00 - 2:00	31	8	39	/	93	0	/X	/	/
2:00 - 3:00	25	6	31	/	56	0	/	/	/
3:00 - 4:00	40	11	51	/	40	0	/	/	/
4:00 - 5:00	155	21	176	/	39	0	/	/	/
5:00 - 6:00	705	134	839	X/X	154	0	X/X	/	X/X
6:00 - 7:00	1583	325	1908	X/X	432	0	X/X	/	X/X
7:00 - 8:00	1565	460	2025	X/X	592	0	X/X	/	X/X
8:00 - 9:00	823	218	1041	X/X	499	0	X/X	/	X/X
9:00 - 10:00	483	117	600	X/	462	0	X/X	/	X/
10:00 - 11:00	394	101	495	X/	452	0	X/X	/	X/
11:00 - 12:00	410	100	510	X/	539	0	X/X	/	X/
12:00 - 13:00	422	112	534	X/	584	0	X/X	/	X/
13:00 - 14:00	470	134	604	X/	668	0	X/X	/	X/
14:00 - 15:00	555	114	669	X/X	950	0	X/X	/	X/X
15:00 - 16:00	484	128	612	X/	1501	0	X/X	/	X/
16:00 - 17:00	544	197	741	X/X	2189	0	X/X	/	X/X
17:00 - 18:00	511	208	719	X/X	2057	0	X/X	/	X/X
18:00 - 19:00	405	134	539	X/	1089	0	X/X	/	X/
19:00 - 20:00	341	94	435	X/	709	0	X/X	/	X/
20:00 - 21:00	278	81	359	/	596	0	X/X	/	/
21:00 - 22:00	259	95	354	/	492	0	X/X	/	/
22:00 - 23:00	186	44	230	/	291	0	X/X	/	/
23:00 - 24:00	86	19	105	/	204	0	X/X	/	/

	Met (Hr)	Required (Hr)	
Warrant 1	15	8	Satisfied
Warrant 2	7	8	Not satisfied
Warrant 6	17	8	Satisfied, check accident record
Warrant 8	13	8	Satisfied
Warrant 9	17	4	Satisfied
Warrant 11	16	1	Satisfied

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55	Major App3: EAST RIVER RD (TH 1) N.B.	4
45	Minor App2: FOLEY BLVD W.B.	3
0	Minor App4: 0	0

0.70 FACTOR USED? YES
 POPULATION < 10,000? YES
 EXISTING SIGNAL ? YES

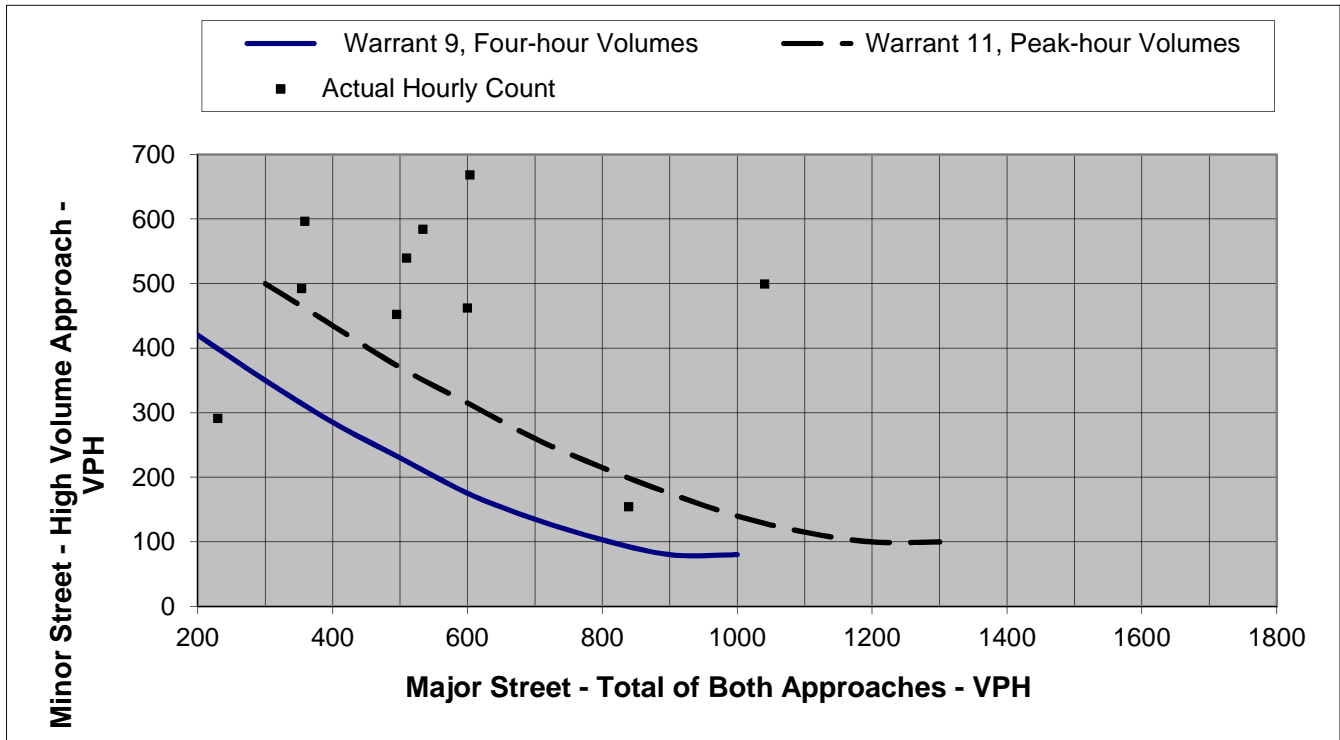


Figure 1. Four Hour and Peak Hour Warrant Analysis

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		64	108
300	350	500	39	93
400	285	435	31	56
500	230	370	51	40
600	175	315	176	39
700	135	260	839	154
800	103	215	1908	432
900	80	175	2025	592
1000	80	140	1041	499
1100		115	600	462
1200		100	495	452
1300		100	510	539
1400			534	584
1500			604	668
1600			669	950
1700			612	1501
1800			741	2189
			719	2057
			539	1089
			435	709
			359	596
			354	492
			230	291
			105	204

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 610 @ EAST RIVER RD NORTH RAMP

COUNTY: ANOKA

REF. POINT: 1+00.239

DATE: 9/11/2000

OPERATOR: M.A.R.

Speed	Approach Description	Lanes
55	Major App1: EAST RIVER RD (TH 1) S.B.	4
55	Major App3: EAST RIVER RD (TH 1) N.B.	4
45	Minor App2: FOLEY BLVD W.B.	3
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	42	22	108	0	172	108	/
1:00 - 2:00	31	8	93	0	132	93	/
2:00 - 3:00	25	6	56	0	87	56	/
3:00 - 4:00	40	11	40	0	91	40	/
4:00 - 5:00	155	21	39	0	215	39	/
5:00 - 6:00	705	134	154	0	993	154	X/X
6:00 - 7:00	1583	325	432	0	2340	432	X/X
7:00 - 8:00	1565	460	592	0	2617	592	X/X
8:00 - 9:00	823	218	499	0	1540	499	X/X
9:00 - 10:00	483	117	462	0	1062	462	X/X
10:00 - 11:00	394	101	452	0	947	452	X/X
11:00 - 12:00	410	100	539	0	1049	539	X/X
12:00 - 13:00	422	112	584	0	1118	584	X/X
13:00 - 14:00	470	134	668	0	1272	668	X/X
14:00 - 15:00	555	114	950	0	1619	950	X/X
15:00 - 16:00	484	128	1501	0	2113	1501	X/X
16:00 - 17:00	544	197	2189	0	2930	2189	X/X
17:00 - 18:00	511	208	2057	0	2776	2057	X/X
18:00 - 19:00	405	134	1089	0	1628	1089	X/X
19:00 - 20:00	341	94	709	0	1144	709	X/X
20:00 - 21:00	278	81	596	0	955	596	X/X
21:00 - 22:00	259	95	492	0	846	492	X/X
22:00 - 23:00	186	44	291	0	521	291	X/X
23:00 - 24:00	86	19	204	0	309	204	/X

Met (Hr) Required (Hr)

Allway Stop Warrant: **18** 8 **Satisfied**

REMARKS: _____



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: EAST RIVER RD (TH 1) S.B.

COUNTY: ANOKA

REF. PT.: 1+00.239

SITE CODE: 23661001

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		37	48					42	
1:00 - 2:00		25	37					31	
2:00 - 3:00		24	26					25	
3:00 - 4:00		38	43					40	
4:00 - 5:00		164	147					155	
5:00 - 6:00		694	716					705	
6:00 - 7:00		1589	1577					1583	
7:00 - 8:00		1585	1545					1565	
8:00 - 9:00		782	864					823	
9:00 - 10:00		492	475					483	
10:00 - 11:00		411	378					394	
11:00 - 12:00	392	429						410	
12:00 - 13:00	392	452						422	
13:00 - 14:00	494	446						470	
14:00 - 15:00	558	553						555	
15:00 - 16:00	480	489						484	
16:00 - 17:00	527	561						544	
17:00 - 18:00	509	514						511	
18:00 - 19:00	407	403						405	
19:00 - 20:00	316	366						341	
20:00 - 21:00	255	301						278	
21:00 - 22:00	261	258						259	
22:00 - 23:00	172	201						186	
23:00 - 24:00	83	90						86	
TOTAL	4846	10904	5856					10797	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> a:\23661025



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: FOLEY BLVD W.B.

COUNTY: ANOKA

REF. PT.: 1+00.239

SITE CODE: 23661001

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		85	132					108	
1:00 - 2:00		91	95					93	
2:00 - 3:00		53	60					56	
3:00 - 4:00		44	37					40	
4:00 - 5:00		36	42					39	
5:00 - 6:00		149	160					154	
6:00 - 7:00		441	424					432	
7:00 - 8:00		583	601					592	
8:00 - 9:00		495	503					499	
9:00 - 10:00		448	476					462	
10:00 - 11:00		451	454					452	
11:00 - 12:00	541	537						539	
12:00 - 13:00	574	595						584	
13:00 - 14:00	653	683						668	
14:00 - 15:00	939	962						950	
15:00 - 16:00	1489	1514						1501	
16:00 - 17:00	2193	2185						2189	
17:00 - 18:00	2056	2059						2057	
18:00 - 19:00	1037	1142						1089	
19:00 - 20:00	668	751						709	
20:00 - 21:00	563	629						596	
21:00 - 22:00	467	518						492	
22:00 - 23:00	259	324						291	
23:00 - 24:00	194	214						204	
TOTAL	11633	14989	2984					14796	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> a:\23661011



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: EAST RIVER RD (TH 1) N.B.

COUNTY: ANOKA

REF. PT.: 1+00.239

SITE CODE: 23661001

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		24	20					22	
1:00 - 2:00		10	6					8	
2:00 - 3:00		4	8					6	
3:00 - 4:00		12	10					11	
4:00 - 5:00		17	25					21	
5:00 - 6:00		133	135					134	
6:00 - 7:00		312	339					325	
7:00 - 8:00		475	446					460	
8:00 - 9:00		216	221					218	
9:00 - 10:00		102	133					117	
10:00 - 11:00	100	103						101	
11:00 - 12:00	96	104						100	
12:00 - 13:00	119	106						112	
13:00 - 14:00	133	136						134	
14:00 - 15:00	122	107						114	
15:00 - 16:00	124	132						128	
16:00 - 17:00	184	210						197	
17:00 - 18:00	203	213						208	
18:00 - 19:00	138	131						134	
19:00 - 20:00	81	107						94	
20:00 - 21:00	80	82						81	
21:00 - 22:00	98	93						95	
22:00 - 23:00	39	50						44	
23:00 - 24:00	18	21						19	
TOTAL	1535	2900	1343					2883	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> a:\23611107



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 -->