



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

SIGNAL WARRANTS ANALYSIS

LOCATION: TH-95 & 110TH ST.S. (COTTAGE GROVE)

COUNTY: WASHINGTON

REF. POINT: 126.439

DATE: 11/14/2000

OPERATOR: RE

Speed	Approach Description	Lanes
55	Major App1: TH-95 NB, S OF 110TH ST.S./Co.Rd.78	1
55	Major App3: TH-95 SB, S OF 110TH ST.S./Co.Rd.78	1
0	Minor App2: N/A	0
55	Minor App4: 110TH ST.S./Co.Rd.78 WB, E OF TH-95	1

0.70 FACTOR USED? YES

POPULATION < 10,000? NO

EXISTING SIGNAL ? NO

HOUR	350/525				0/0		105/52		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	11	7	18	/	0	1	/	/	/
1:00 - 2:00	8	5	13	/	0	0	/	/	/
2:00 - 3:00	4	2	6	/	0	2	/	/	/
3:00 - 4:00	8	2	10	/	0	4	/	/	/
4:00 - 5:00	4	9	13	/	0	4	/	/	/
5:00 - 6:00	28	21	49	/	0	17	/	/	/
6:00 - 7:00	132	90	222	/	0	22	/	/	/
7:00 - 8:00	193	155	348	/	0	60	/	/X	/
8:00 - 9:00	123	127	250	/	0	43	/	/	/
9:00 - 10:00	109	87	196	/	0	36	/	/	/
10:00 - 11:00	120	102	222	/	0	41	/	/	/
11:00 - 12:00	111	86	197	/	0	33	/	/	/
12:00 - 13:00	114	67	181	/	0	34	/	/	/
13:00 - 14:00	125	89	214	/	0	34	/	/	/
14:00 - 15:00	153	86	239	/	0	37	/	/	/
15:00 - 16:00	168	151	319	/	0	26	/	/	/
16:00 - 17:00	174	169	343	/	0	20	/	/	/
17:00 - 18:00	185	163	348	/	0	11	/	/	/
18:00 - 19:00	107	96	203	/	0	20	/	/	/
19:00 - 20:00	65	54	119	/	0	18	/	/	/
20:00 - 21:00	69	41	110	/	0	11	/	/	/
21:00 - 22:00	51	34	85	/	0	10	/	/	/
22:00 - 23:00	33	27	60	/	0	7	/	/	/
23:00 - 24:00	19	10	29	/	0	3	/	/	/

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

LOCATION: TH-95 & 110TH ST.S. (COTTAGE GROVE)

COUNTY: WASHINGTON

REF. POINT: 126.439

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OPERATOR: RE

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

Speed	Approach Description	Lanes
55	Major App1: TH-95 NB, S OF 110TH ST.S./Co.Rd.78	1
55	Major App3: TH-95 SB, S OF 110TH ST.S./Co.Rd.78	1
0	Minor App2: N/A	0
55	Minor App4: 110TH ST.S./Co.Rd.78 WB, E OF TH-95	1

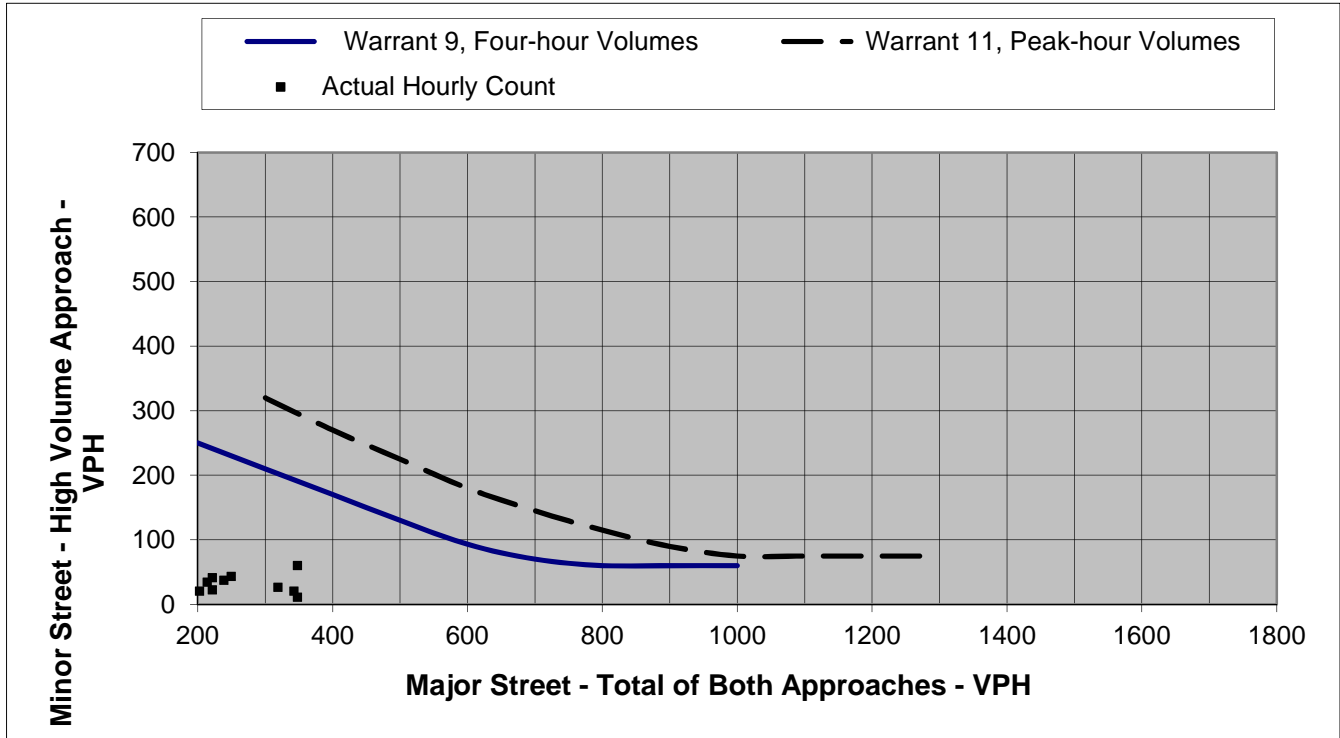


Figure 1. Four Hour and Peak Hour Warrant Analysis

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	250		18	1
300	210	320	13	0
400	170	270	6	2
500	130	225	10	4
600	93	180	13	4
700	70	145	49	17
800	60	115	222	22
900	60	90	348	60
1000	60	75	250	43
1100		75	196	36
1200		75	222	41
1300		75	197	33
1400			181	34
1500			214	34
1600			239	37
1700			319	26
1800			343	20
			348	11
			203	20
			119	18
			110	11
			85	10
			60	7
			29	3

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-95 & 110TH ST.S. (COTTAGE GROVE)

COUNTY: WASHINGTON

REF. POINT: 126.439

DATE: 11/14/2000

OPERATOR: RE

Speed	Approach Description	Lanes
55	Major App1: TH-95 NB, S OF 110TH ST.S./Co.Rd.78	1
55	Major App3: TH-95 SB, S OF 110TH ST.S./Co.Rd.78	1
0	Minor App2: N/A	0
55	Minor App4: 110TH ST.S./Co.Rd.78 WB, E OF TH-95	1

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	11	7	0	1	19	1	/
1:00 - 2:00	8	5	0	0	13	0	/
2:00 - 3:00	4	2	0	2	8	2	/
3:00 - 4:00	8	2	0	4	14	4	/
4:00 - 5:00	4	9	0	4	17	4	/
5:00 - 6:00	28	21	0	17	66	17	/
6:00 - 7:00	132	90	0	22	244	22	/
7:00 - 8:00	193	155	0	60	408	60	X/
8:00 - 9:00	123	127	0	43	293	43	/
9:00 - 10:00	109	87	0	36	232	36	/
10:00 - 11:00	120	102	0	41	263	41	/
11:00 - 12:00	111	86	0	33	230	33	/
12:00 - 13:00	114	67	0	34	215	34	/
13:00 - 14:00	125	89	0	34	248	34	/
14:00 - 15:00	153	86	0	37	276	37	/
15:00 - 16:00	168	151	0	26	345	26	/
16:00 - 17:00	174	169	0	20	363	20	X/
17:00 - 18:00	185	163	0	11	359	11	X/
18:00 - 19:00	107	96	0	20	223	20	/
19:00 - 20:00	65	54	0	18	137	18	/
20:00 - 21:00	69	41	0	11	121	11	/
21:00 - 22:00	51	34	0	10	95	10	/
22:00 - 23:00	33	27	0	7	67	7	/
23:00 - 24:00	19	10	0	3	32	3	/

Allway Stop Warrant: Met (Hr) 0 Required (Hr) 8 Not satisfied

REMARKS: _____



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: TH-95 NB, S OF 110TH ST.S./Co.Rd.78

COUNTY: WASHINGTON

REF. PT.: 126.439

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING: **November 14, 2000**

DATE HOUR \ DAY	13 MON.	14 TUE.	15 WED.	16 THU.	17 FRI.	18 SAT.	19 SUN.	AVE. WK.DAY	AVE. WKEND
0:00 - 1:00			11					11	
1:00 - 2:00			8					8	
2:00 - 3:00			4					4	
3:00 - 4:00			8					8	
4:00 - 5:00			4					4	
5:00 - 6:00			28					28	
6:00 - 7:00			132					132	
7:00 - 8:00			193					193	
8:00 - 9:00			123					123	
9:00 - 10:00			109					109	
10:00 - 11:00			120					120	
11:00 - 12:00		124	98					111	
12:00 - 13:00		96	133					114	
13:00 - 14:00		136	115					125	
14:00 - 15:00		154	153					153	
15:00 - 16:00		162	175					168	
16:00 - 17:00		179	170					174	
17:00 - 18:00		173	198					185	
18:00 - 19:00		99	116					107	
19:00 - 20:00		64	66					65	
20:00 - 21:00		81	58					69	
21:00 - 22:00		51						51	
22:00 - 23:00		33						33	
23:00 - 24:00		19						19	
TOTAL		1371	2022					2114	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> a:\95NBS110



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 -->



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: TH-95 SB, S OF 110TH ST.S./Co.Rd.78

COUNTY: WASHINGTON

REF. PT.: 126.439

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING: **November 14, 2000**

DATE HOUR \ DAY	13 MON.	14 TUE.	15 WED.	16 THU.	17 FRI.	18 SAT.	19 SUN.	AVE. WK.DAY	AVE. WKEND
0:00 - 1:00			7					7	
1:00 - 2:00			5					5	
2:00 - 3:00			2					2	
3:00 - 4:00			2					2	
4:00 - 5:00			9					9	
5:00 - 6:00			21					21	
6:00 - 7:00			90					90	
7:00 - 8:00			155					155	
8:00 - 9:00			127					127	
9:00 - 10:00			87					87	
10:00 - 11:00			102					102	
11:00 - 12:00		77	95					86	
12:00 - 13:00		56	78					67	
13:00 - 14:00		87	92					89	
14:00 - 15:00		85	87					86	
15:00 - 16:00		140	163					151	
16:00 - 17:00		170	168					169	
17:00 - 18:00		166	160					163	
18:00 - 19:00		98	94					96	
19:00 - 20:00		47	62					54	
20:00 - 21:00		36	47					41	
21:00 - 22:00		34						34	
22:00 - 23:00		27						27	
23:00 - 24:00		10						10	
TOTAL		1033	1653					1680	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> a:\95SBN110



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: 110TH ST.S./Co.Rd.78 WB, E OF TH-95

COUNTY: WASHINGTON

REF. PT.: 126.439

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING: **November 14, 2000**

DATE HOUR \ DAY	13 MON.	14 TUE.	15 WED.	16 THU.	17 FRI.	18 SAT.	19 SUN.	AVE. WK.DAY	AVE. WKEND
0:00 - 1:00			0	3				1	
1:00 - 2:00			0	1				0	
2:00 - 3:00			1	3				2	
3:00 - 4:00			3	6				4	
4:00 - 5:00			4	5				4	
5:00 - 6:00			17	17				17	
6:00 - 7:00			22					22	
7:00 - 8:00			60					60	
8:00 - 9:00			43					43	
9:00 - 10:00			36					36	
10:00 - 11:00			41					41	
11:00 - 12:00		33	33					33	
12:00 - 13:00		35	34					34	
13:00 - 14:00		34	35					34	
14:00 - 15:00		34	40					37	
15:00 - 16:00		24	28					26	
16:00 - 17:00		20	21					20	
17:00 - 18:00		11	11					11	
18:00 - 19:00		21	20					20	
19:00 - 20:00		18	18					18	
20:00 - 21:00		9	14					11	
21:00 - 22:00		6	14					10	
22:00 - 23:00		5	10					7	
23:00 - 24:00		0	6					3	
TOTAL		250	511	35				494	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS: _____

CORRECTED AADT: _____

DATA FILE --> a:\110WBE95