



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

SIGNAL WARRANTS ANALYSIS

LOCATION: TH-244 & ASH ST.

COUNTY: WASHINGTON

REF. POINT: 004.002

DATE: 7/16/1996

OPERATOR: RE

Speed	Approach Description	Lanes
30	Major App1: TH-244 NB, S OF ASH ST.	2
30	Major App3: TH-244 SB, N OF ASH ST.	2
30	Minor App2: ASH STREET EB, W OF TH-244	2
30	Minor App4: ASH STREET WB, E OF TH-244	2

0.70 FACTOR USED? NO

POPULATION < 10,000? NO

EXISTING SIGNAL ? NO

HOUR	600/900			200/100		200/100		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	29	25	54	/	6	3	/	/	/
1:00 - 2:00	20	13	33	/	0	2	/	/	/
2:00 - 3:00	13	6	19	/	0	1	/	/	/
3:00 - 4:00	9	9	18	/	1	0	/	/	/
4:00 - 5:00	4	27	31	/	2	1	/	/	/
5:00 - 6:00	19	93	112	/	1	3	/	/	/
6:00 - 7:00	58	295	353	/	16	17	/	/	/
7:00 - 8:00	104	481	585	/	16	48	/	/	/
8:00 - 9:00	138	384	522	/	26	61	/	/	/
9:00 - 10:00	138	333	471	/	23	59	/	/	/
10:00 - 11:00	165	283	448	/	20	48	/	/	/
11:00 - 12:00	196	298	494	/	28	69	/	/	/
12:00 - 13:00	225	280	505	/	34	68	/	/	/
13:00 - 14:00	196	272	468	/	26	57	/	/	/
14:00 - 15:00	235	269	504	/	29	66	/	/	/
15:00 - 16:00	255	307	562	/	38	84	/	/	/
16:00 - 17:00	351	336	687	X/	35	93	/	/	/
17:00 - 18:00	439	429	868	X/	49	110	/	/X	/
18:00 - 19:00	346	397	743	X/	44	81	/	/	/
19:00 - 20:00	243	303	546	/	32	55	/	/	/
20:00 - 21:00	259	278	537	/	37	62	/	/	/
21:00 - 22:00	219	227	446	/	28	53	/	/	/
22:00 - 23:00	129	108	237	/	15	25	/	/	/
23:00 - 24:00	71	53	124	/	7	9	/	/	/

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

LOCATION: TH-244 & ASH ST.

COUNTY: WASHINGTON

REF. POINT: 004.002

DATE: 7/16/1996

OPERATOR: RE

0.70 FACTOR USED? NO

POPULATION < 10,000? NO

EXISTING SIGNAL ? NO

Speed	Approach Description	Lanes
30	Major App1: TH-244 NB, S OF ASH ST.	2
30	Major App3: TH-244 SB, N OF ASH ST.	2
30	Minor App2: ASH STREET EB, W OF TH-244	2
30	Minor App4: ASH STREET WB, E OF TH-244	2

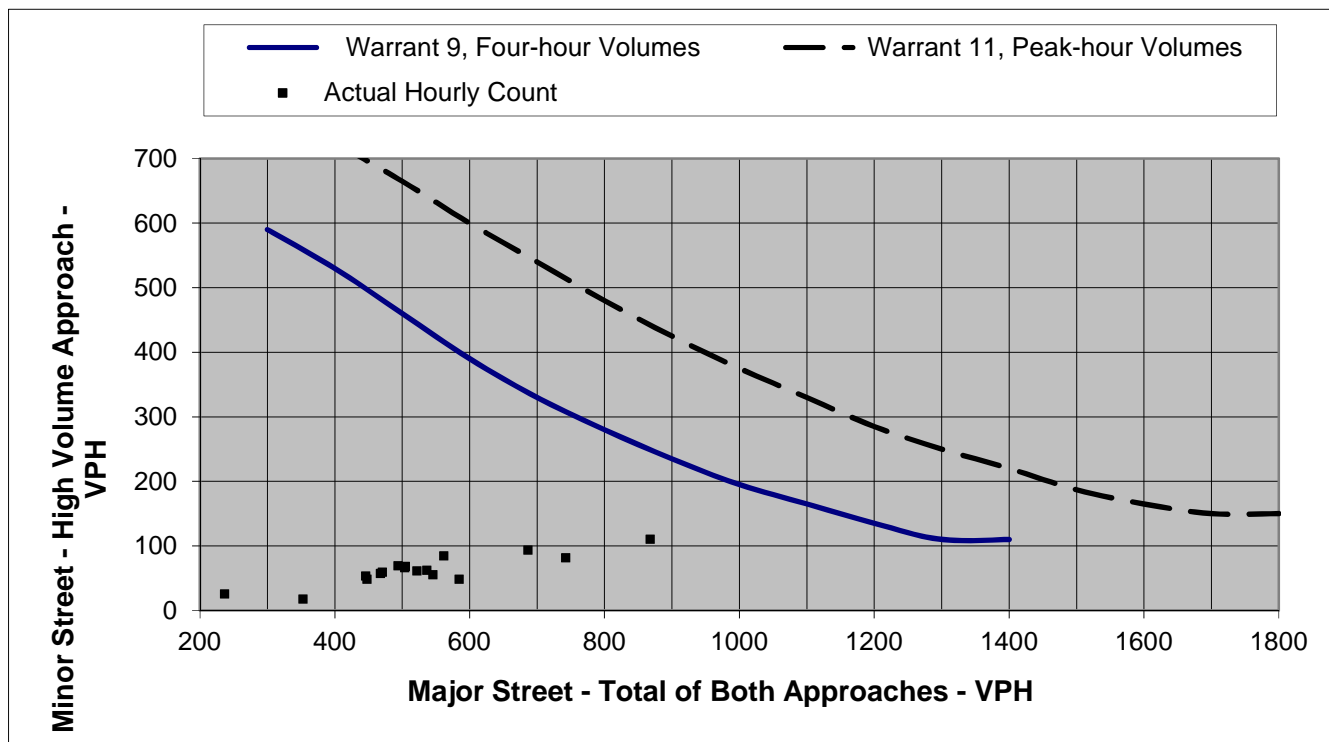


Figure 1. Four Hour and Peak Hour Warrant Analysis

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			54	6
300	590		33	2
400	530	725	19	1
500	460	665	18	1
600	390	600	31	2
700	330	540	112	3
800	280	480	353	17
900	235	425	585	48
1000	195	375	522	61
1100	165	330	471	59
1200	135	285	448	48
1300	110	250	494	69
1400	110	220	505	68
1500		187	468	57
1600		165	504	66
1700		150	562	84
1800		150	687	93
			868	110
			743	81
			546	55
			537	62
			446	53
			237	25
			124	9

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-244 & ASH ST.

COUNTY: WASHINGTON

REF. POINT: 004.002

DATE:

OPERATOR: RE

0.70 FACTOR USED? No

Speed	Approach Description	Lanes
30	Major App1: TH-244 NB, S OF ASH ST.	2
30	Major App3: TH-244 SB, N OF ASH ST.	2
30	Minor App2: ASH STREET EB, W OF TH-244	2
30	Minor App4: ASH STREET WB, E OF TH-244	2

HOUR	MAJOR APP. 1	MAJOR APP. 3	MINOR APP. 2	MINOR APP. 4	500	200	WARRANT MET
					TOTAL Σ (APP.1 to APP. 4)	MINOR TOTAL APP. 2 + APP. 4	
0:00 - 1:00	29	25	6	3	63	9	/
1:00 - 2:00	20	13	0	2	35	2	/
2:00 - 3:00	13	6	0	1	20	1	/
3:00 - 4:00	9	9	1	0	19	1	/
4:00 - 5:00	4	27	2	1	34	3	/
5:00 - 6:00	19	93	1	3	116	4	/
6:00 - 7:00	58	295	16	17	386	33	/
7:00 - 8:00	104	481	16	48	649	64	X/
8:00 - 9:00	138	384	26	61	609	87	X/
9:00 - 10:00	138	333	23	59	553	82	X/
10:00 - 11:00	165	283	20	48	516	68	X/
11:00 - 12:00	196	298	28	69	591	97	X/
12:00 - 13:00	225	280	34	68	607	102	X/
13:00 - 14:00	196	272	26	57	551	83	X/
14:00 - 15:00	235	269	29	66	599	95	X/
15:00 - 16:00	255	307	38	84	684	122	X/
16:00 - 17:00	351	336	35	93	815	128	X/
17:00 - 18:00	439	429	49	110	1027	159	X/
18:00 - 19:00	346	397	44	81	868	125	X/
19:00 - 20:00	243	303	32	55	633	87	X/
20:00 - 21:00	259	278	37	62	636	99	X/
21:00 - 22:00	219	227	28	53	527	81	X/
22:00 - 23:00	129	108	15	25	277	40	/
23:00 - 24:00	71	53	7	9	140	16	/

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-244 NB, S OF ASH ST.

COUNTY: WASHINGTON

REF. PT.: 004.002

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING: **July 16, 1996**

DATE HOUR \ DAY	15 MON.	16 TUE.	17 WED.	18 THU.	19 FRI.	20 SAT.	21 SUN.	AVE. WK.DAY	AVE. WKEND
0:00 - 1:00			23	32	34			29	
1:00 - 2:00			22	18	20			20	
2:00 - 3:00			13	15	12			13	
3:00 - 4:00			5	12	12			9	
4:00 - 5:00			3	3	7			4	
5:00 - 6:00			20	17	22			19	
6:00 - 7:00			60	59	56			58	
7:00 - 8:00			105	109	99			104	
8:00 - 9:00			149	127	139			138	
9:00 - 10:00			132	137	145			138	
10:00 - 11:00			167	164				165	
11:00 - 12:00			211	181				196	
12:00 - 13:00			203	247				225	
13:00 - 14:00			198	194				196	
14:00 - 15:00		226	250	230				235	
15:00 - 16:00		260	252	254				255	
16:00 - 17:00		359	365	329				351	
17:00 - 18:00		450	424	444				439	
18:00 - 19:00		365	341	334				346	
19:00 - 20:00		228	251	252				243	
20:00 - 21:00		259	250	269				259	
21:00 - 22:00		222	212	224				219	
22:00 - 23:00		123	138	127				129	
23:00 - 24:00		70	67	77				71	
TOTAL		2562	3861	3855	546			3861	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> a:\TH244ASH.DA1



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: ASH STREET EB, W OF TH-244
 COUNTY: WASHINGTON
 REF. PT.: 004.002

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING: **July 16, 1996**

DATE HOUR \ DAY	15 MON.	16 TUE.	17 WED.	18 THU.	19 FRI.	20 SAT.	21 SUN.	AVE. WK.DAY	AVE. WKEND
0:00 - 1:00			3	7	10			6	
1:00 - 2:00			0	0	0			0	
2:00 - 3:00			0	1	1			0	
3:00 - 4:00			0	2	2			1	
4:00 - 5:00			2	3	2			2	
5:00 - 6:00			1	1	1			1	
6:00 - 7:00			17	20	13			16	
7:00 - 8:00			21	16	13			16	
8:00 - 9:00			36	23	20			26	
9:00 - 10:00			30	21	20			23	
10:00 - 11:00			18	23				20	
11:00 - 12:00			24	32				28	
12:00 - 13:00			38	30				34	
13:00 - 14:00			22	31				26	
14:00 - 15:00		29	25	34				29	
15:00 - 16:00		37	42	37				38	
16:00 - 17:00		37	43	25				35	
17:00 - 18:00		53	56	40				49	
18:00 - 19:00		48	35	49				44	
19:00 - 20:00		31	36	30				32	
20:00 - 21:00		31	45	36				37	
21:00 - 22:00		35	32	18				28	
22:00 - 23:00		20	18	7				15	
23:00 - 24:00		5	12	5				7	
TOTAL		326	556	491	82			513	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS: _____

CORRECTED AADT: _____

DATA FILE --> a:\TH244ASH.DA2



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: TH-244 SB, N OF ASH ST.

COUNTY: WASHINGTON

REF. PT.: 004.002

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING: **July 16, 1996**

DATE HOUR \ DAY	15 MON.	16 TUE.	17 WED.	18 THU.	19 FRI.	20 SAT.	21 SUN.	AVE. WK.DAY	AVE. WKEND
0:00 - 1:00			22	23	31			25	
1:00 - 2:00			13	20	8			13	
2:00 - 3:00			8	6	6			6	
3:00 - 4:00			6	9	14			9	
4:00 - 5:00			28	26	29			27	
5:00 - 6:00			96	99	86			93	
6:00 - 7:00			317	287	281			295	
7:00 - 8:00			434	458	551			481	
8:00 - 9:00			360	350	442			384	
9:00 - 10:00			278	282	440			333	
10:00 - 11:00			304	262				283	
11:00 - 12:00			327	270				298	
12:00 - 13:00			283	278				280	
13:00 - 14:00			283	262				272	
14:00 - 15:00		257	265	285				269	
15:00 - 16:00		307	305	311				307	
16:00 - 17:00		366	320	323				336	
17:00 - 18:00		452	410	425				429	
18:00 - 19:00		366	442	384				397	
19:00 - 20:00		308	313	289				303	
20:00 - 21:00		253	267	315				278	
21:00 - 22:00		238	195	249				227	
22:00 - 23:00		97	100	129				108	
23:00 - 24:00		42	51	66				53	
TOTAL		2686	5427	5408	1888			5506	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> a:\TH244ASH.DA3



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

TRAFFIC COUNT DATA

ROUTE #: ASH STREET WB, E OF TH-244
 COUNTY: WASHINGTON
 REF. PT.: 004.002

SITE CODE: APPROACH

OPERATOR: RE

FOR COUNTS BEGINNING: **July 16, 1996**

DATE HOUR \ DAY	15 MON.	16 TUE.	17 WED.	18 THU.	19 FRI.	20 SAT.	21 SUN.	AVE. WK.DAY	AVE. WKEND
0:00 - 1:00			3	4	4			3	
1:00 - 2:00			2	3	3			2	
2:00 - 3:00			1	1	1			1	
3:00 - 4:00			0	2	0			0	
4:00 - 5:00			0	0	3			1	
5:00 - 6:00			4	4	2			3	
6:00 - 7:00			15	20	18			17	
7:00 - 8:00			43	44	58			48	
8:00 - 9:00			59	52	73			61	
9:00 - 10:00			45	60	74			59	
10:00 - 11:00			58	39				48	
11:00 - 12:00			70	69				69	
12:00 - 13:00			70	66				68	
13:00 - 14:00			58	56				57	
14:00 - 15:00		66	70	64				66	
15:00 - 16:00		83	80	91				84	
16:00 - 17:00		100	91	89				93	
17:00 - 18:00		110	108	113				110	
18:00 - 19:00		74	85	84				81	
19:00 - 20:00		54	58	53				55	
20:00 - 21:00		50	61	77				62	
21:00 - 22:00		55	47	59				53	
22:00 - 23:00		21	24	30				25	
23:00 - 24:00		4	14	9				9	
TOTAL		617	1066	1089	236			1075	

24 HOURS FACTOR:

FACTORED ADT:

REMARKS:

CORRECTED AADT:

DATA FILE --> a:\TH244ASH.DA4