

Date : 8/6/01

Count Number : TMC0125

Location : CSAH 23

@ CR 105/I-35W Ramps

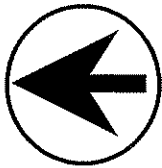
CR 105

3293

#2

1642	D	935
155	E	552
155	F	155

1651



North

CSAH 23

12645

#3

200	G	5947
4340	H	
1407	J	

6698

CSAH 23

2068

#4

151	M	2709
675	L	1883
1883	K	

4777

10971

#1

5426

5545	A	109
4660	B	4660
776	C	776

I-35W Ramps

	LANES OF APPROACH			TOTAL
	RIGHT TURN LANE	LEFT TURN LANE	THRU LANES	
#1	1	0	2	3
#2	0	0	1	1
#3	0	1	2	3
#4	0	0	1	1

Anoka County Highway Department

Traffic Volume and Turning

Movement Study

Anoka County Highway Department Traffic Engineering

Weather: Hot, Humid
Counter: TDC-8
Counted by: Jessica/Melissa

Traffic Volume and Turning Movement Stud

File Name : TMC0125
Site Code : 01250101
Start Date : 08/06/2001
Page No : 1

Groups Printed- 1 - Unshifted

Start Time	CR 105 Southbound					CSAH 23 Westbound					CSAH 23 Northbound					I-35W Ramps Eastbound					Exclu Total	Inclu. Total	Int. Total
	Left	Thru	Rig ht	Hea vy	App. Total	Left	Thru	Rig ht	Hea vy	App. Total	Left	Thru	Rig ht	Hea vy	App. Total	Left	Thru	Rig ht	Hea vy	App. Total			
	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0				
06:00	2	20	25	1	47	55	128	2	2	185	0	7	9	0	16	5	25	2	0	32	3	280	283
06:15	3	23	28	2	54	54	136	2	1	192	0	6	11	2	17	5	27	3	3	35	8	298	306
06:30	1	24	27	1	52	60	136	7	6	203	1	8	5	4	14	4	39	1	10	44	21	313	334
06:45	4	11	25	3	40	55	117	1	2	173	1	6	4	1	11	4	43	0	9	47	15	271	286
Total	10	78	105	7	193	224	517	12	11	753	2	27	29	7	58	18	134	6	22	158	47	1162	1209
07:00	5	16	21	3	42	48	130	3	0	181	3	9	6	2	18	4	46	2	5	52	10	293	303
07:15	0	29	33	1	62	37	119	1	5	157	1	5	10	1	16	12	39	0	3	51	10	286	296
07:30	0	31	27	3	58	54	123	3	5	180	0	5	4	0	9	8	32	2	3	42	11	289	300
07:45	2	17	21	0	40	43	95	1	4	139	1	4	12	1	17	3	48	0	7	51	12	247	259
Total	7	93	102	7	202	182	467	8	14	657	5	23	32	4	60	27	165	4	18	196	43	1115	1158
08:00	1	9	15	1	25	11	97	2	8	110	0	10	15	1	25	4	45	2	7	51	17	211	228
08:15	2	8	12	1	22	26	92	0	8	118	2	5	12	0	19	5	43	3	7	51	16	210	226
08:30	2	12	17	3	31	20	91	3	5	114	2	2	12	4	16	4	48	2	8	54	20	215	235
08:45	4	6	17	1	27	13	76	2	4	91	8	9	14	5	31	4	45	2	12	51	22	200	222
Total	9	35	61	6	105	70	356	7	25	433	12	26	53	10	91	17	181	9	34	207	75	836	911
09:00	2	8	11	1	21	26	68	1	8	95	4	6	13	7	23	2	40	1	8	43	24	182	206
09:15	1	6	10	1	17	24	69	2	7	95	2	9	16	2	27	5	42	4	3	51	13	190	203
09:30	0	7	14	0	21	27	81	1	5	109	3	8	12	3	23	6	49	2	7	57	15	210	225
09:45	5	6	8	0	19	19	71	4	8	94	3	2	13	1	18	6	35	2	4	43	13	174	187
Total	8	27	43	2	78	96	289	8	28	393	12	25	54	13	91	19	166	9	22	194	65	756	821
10:00	2	11	15	0	28	19	61	1	3	81	1	7	17	0	25	5	45	1	6	51	9	185	194
10:15	2	7	15	1	24	13	55	7	4	75	1	9	28	4	38	4	39	1	15	44	24	181	205
10:30	2	8	8	2	18	21	70	3	8	94	3	7	24	5	34	5	44	2	5	51	20	197	217
10:45	3	9	13	2	25	19	56	2	5	77	5	4	19	4	28	5	60	1	7	66	18	196	214
Total	9	35	51	5	95	72	242	13	20	327	10	27	88	13	125	19	188	5	33	212	71	759	830
11:00	3	2	15	0	20	19	58	2	11	79	3	9	36	2	48	6	55	2	7	63	20	210	230
11:15	2	4	14	1	20	23	55	3	8	81	3	3	28	6	34	4	62	6	7	72	22	207	229
11:30	4	3	19	0	26	11	51	3	6	65	5	12	28	0	45	2	32	0	2	34	8	170	178
11:45	3	5	11	1	19	25	59	5	5	89	2	9	31	1	42	7	47	1	3	55	10	205	215
Total	12	14	59	2	85	78	223	13	30	314	13	33	123	9	169	19	196	9	19	224	60	792	852
12:00	0	6	7	2	13	15	48	3	7	66	2	8	30	1	40	8	73	3	8	84	18	203	221
12:15	4	4	14	1	22	35	53	2	4	90	2	14	35	1	51	16	71	0	11	87	17	250	267
12:30	5	6	12	1	23	26	70	3	8	99	2	13	44	2	59	10	64	0	8	74	19	255	274
12:45	4	5	10	3	19	20	68	2	5	90	3	5	24	4	32	13	67	2	9	82	21	223	244
Total	13	21	43	7	77	96	239	10	24	345	9	40	133	8	182	47	275	5	36	327	75	931	1006
13:00	6	6	11	2	23	17	72	4	7	93	4	11	35	1	50	11	68	0	8	79	18	245	263
13:15	5	7	9	3	21	20	72	2	8	94	3	12	38	3	53	12	69	1	9	82	23	250	273
13:30	7	5	13	2	25	26	60	4	5	90	5	9	39	2	53	9	72	2	11	83	20	251	271
13:45	9	4	16	3	29	28	65	3	6	96	3	12	26	4	41	13	66	0	10	79	23	245	268
Total	27	22	49	10	98	91	269	13	26	373	15	44	138	10	197	45	275	3	38	323	84	991	1075
14:00	1	10	12	0	23	18	68	5	6	91	7	10	35	4	52	13	100	1	8	114	18	280	298
14:15	2	11	19	2	32	19	71	4	5	94	8	10	31	1	49	12	107	2	9	121	17	296	313
14:30	3	6	18	1	27	23	63	5	5	91	4	11	39	1	54	22	123	1	13	146	20	318	338
14:45	0	14	14	0	28	27	60	3	13	90	5	11	36	1	52	15	111	3	8	129	22	299	321
Total	6	41	63	3	110	87	262	17	29	366	24	42	141	7	207	62	441	7	38	510	77	1193	1270
15:00	1	6	8	0	15	13	63	2	9	78	0	14	62	3	76	20	116	1	7	137	19	306	325
15:15	0	8	11	0	19	19	54	0	4	73	3	16	55	2	74	20	127	2	9	149	15	315	330
15:30	5	6	16	0	27	22	69	4	8	95	3	22	73	2	98	28	139	5	8	172	18	392	410
15:45	2	5	7	1	14	16	49	4	6	69	3	17	58	1	78	22	144	2	6	168	14	329	343
Total	8	25	42	1	75	70	235	10	27	315	9	69	248	8	326	90	526	10	30	626	66	1342	1408
16:00	1	3	14	1	18	5	52	4	4	61	3	26	61	3	90	36	151	3	11	190	19	359	378
16:15	0	10	16	0	26	20	69	3	6	92	1	22	60	0	83	30	151	3	15	184	21	385	406
16:30	3	10	18	2	31	23	71	6	1	100	1	12	55	1	68	15	125	4	1	144	5	343	348
16:45	4	6	20	1	30	18	63	5	6	86	2	20	41	1	63	17	135	4	7	156	15	335	350
Total	8	29	68	4	105	66	255	18	17	339	7	80	217	5	304	98	562	14	34	674	60	1422	1482
17:00	2	8	15	0	25	29	78	7	4	114	2	27	88	1	117	30	156	2	13	188	18	444	462
17:15	4	10	21	2	35	16	73	2	2	91	3	12	64	4	79	30	145	2	5	177	13	382	395
17:30	3	9	20	1	32	18	75	5	3	98	4	13	66	2	83	25	145	1	4	171	10	384	394
17:45	2	10	13	1	25	20	68	6	6	94	3	14	57	1	74	22	122	2	6</				

**Anoka County Highway Department
Traffic Engineering**

Weather: Hot, Humid
Counter: TDC-8
Counted by: Jessica/Melissa

Traffic Volume and Turning Movement Stud

File Name : TMC0125
Site Code : 01250101
Start Date : 08/06/2001
Page No : 2

Groups Printed- 1 - Unshifted

Start Time	CR 105 Southbound					CSAH 23 Westbound					CSAH 23 Northbound					I-35W Ramps Eastbound					Exclu Total	Inclu. Total	Int. Total
	Left	Thru	Rig ht	Hea vy	App. Total	Left	Thru	Rig ht	Hea vy	App. Total	Left	Thru	Rig ht	Hea vy	App. Total	Left	Thru	Rig ht	Hea vy	App. Total			
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0				
18:00	1	7	8	0	16	22	56	7	5	85	1	10	41	1	52	17	93	3	8	113	14	266	280
18:15	1	10	22	1	33	16	67	8	1	91	2	15	35	1	52	16	88	1	1	105	4	281	285
18:30	3	7	15	0	25	21	57	2	3	80	1	10	22	1	33	26	68	6	5	100	9	238	247
18:45	1	4	6	1	11	16	57	3	3	76	0	17	24	1	41	11	70	0	2	81	7	209	216
Total	6	28	51	2	85	75	237	20	12	332	4	52	122	4	178	70	319	10	16	399	34	994	1028
19:00	2	11	14	0	27	15	49	2	2	66	1	8	12	1	21	18	75	0	4	93	7	207	214
19:15	1	4	13	1	18	8	58	5	2	71	0	7	16	0	23	12	68	1	3	81	6	193	199
19:30	1	2	18	0	21	10	42	5	0	57	1	8	20	2	29	9	62	0	1	71	3	178	181
19:45	2	3	4	1	9	15	41	2	0	58	2	9	27	0	38	9	68	1	4	78	5	183	188
Total	6	20	49	2	75	48	190	14	4	252	4	32	75	3	111	48	273	2	12	323	21	761	782
20:00	3	2	10	0	15	12	43	1	1	56	2	15	15	0	32	7	49	3	0	59	1	162	163
20:15	3	4	11	0	18	8	36	1	4	45	1	11	28	0	40	12	57	2	2	71	6	174	180
20:30	0	8	13	0	21	9	38	3	3	50	1	13	21	0	35	13	54	0	1	67	4	173	177
20:45	1	9	16	0	26	14	36	3	0	53	3	8	15	1	26	9	58	0	2	67	3	172	175
Total	7	23	50	0	80	43	153	8	8	204	7	47	79	1	133	41	218	5	5	264	14	681	695
21:00	4	7	6	0	17	5	34	3	2	42	1	13	27	1	41	14	50	1	1	65	4	165	169
21:15	3	5	10	0	18	9	30	3	0	42	2	11	19	0	32	13	45	1	0	59	0	151	151
21:30	1	8	5	0	14	8	28	2	1	38	1	10	15	1	26	12	42	2	0	56	2	134	136
21:45	0	4	9	0	13	4	20	1	0	25	2	8	15	0	25	10	36	0	1	46	1	109	110
Total	8	24	30	0	62	26	112	9	3	147	6	42	76	2	124	49	173	4	2	226	7	559	566
Grand Total	155	552	935	62	1642	140	434	200	293	5947	151	675	188	112	2709	776	466	109	387	5545	854	1584	1669
Apprch %	9.4	33.6	56.9			23.7	73.0	3.4			5.6	24.9	69.5			14.0	84.0	2.0					
Total %	1.0	3.5	5.9		10.4	8.9	27.4	1.3		37.5	1.0	4.3	11.9		17.1	4.9	29.4	0.7		35.0	5.1	94.9	

Major Street Approaches:

Eastbound:

I-35W Ramps

Data File: C:\Program Files\PCWarrants\TMC0125.war
 Count Type: IMC. Channel: 0. Count Date: 8/ 6/ 1
 Number of Lanes: 2
 Approach Speed: 55
 Total Approach Traffic: 5545

Westbound:

CSAH 23

Data File: C:\Program Files\PCWarrants\TMC0125.war
 Count Type: IMC. Channel: 0. Count Date: 8/ 6/ 1
 Number of Lanes: 2
 Approach Speed: 55
 Total Approach Traffic: 5947

Minor Street Approaches:

Northbound:

CSAH 23

Data File: C:\Program Files\PCWarrants\TMC0125.war
 Count Type: IMC. Channel: 0. Count Date: 8/ 6/ 1
 Number of Lanes: 1
 Approach Speed: 35
 Total Approach Traffic: 2709

Southbound:

CR 105

Data File: C:\Program Files\PCWarrants\TMC0125.war
 Count Type: IMC. Channel: 0. Count Date: 8/ 6/ 1
 Number of Lanes: 1
 Approach Speed: 35
 Total Approach Traffic: 1642

Analysis of 8-Hour Volume Warrants (Criteria refers to high volume side street for that hour):

Hour	Main (Total)	Side			Warrant 1		Warrant 2		Warrant 8	
		Vol.	Dir.	Rank	Meets?	Criteria	Meets?	Criteria	Meets?	Criteria
0	0	0	S	17		105		52		84
1	0	0	S	18		105		52		84
2	0	0	S	19		105		52		84
3	0	0	S	20		105		52		84
4	0	0	S	21		105		52		84
5	0	0	S	22		105		52		84
6	911	193	S	7	--BOTH--	105	--BOTH--	52	--BOTH--	84
7	853	202	S	5	--BOTH--	105	--BOTH--	52	--BOTH--	84
8	640	105	S	15	--BOTH--	105	--BOTH--	52	--BOTH--	84
9	587	91	N	16	MAIN	105	SIDE	52	--BOTH--	84
10	539	125	N	12	--BOTH--	105	SIDE	52	--BOTH--	84
11	538	169	N	10	--BOTH--	105	SIDE	52	--BOTH--	84
12	672	182	N	8	--BOTH--	105	--BOTH--	52	--BOTH--	84
13	696	197	N	6	--BOTH--	105	--BOTH--	52	--BOTH--	84
14	876	207	N	4	--BOTH--	105	--BOTH--	52	--BOTH--	84
15	941	326	N	2	--BOTH--	105	--BOTH--	52	--BOTH--	84
16	1013	304	N	3	--BOTH--	105	--BOTH--	52	--BOTH--	84
17	1079	353	N	1	--BOTH--	105	--BOTH--	52	--BOTH--	84
18	731	178	N	9	--BOTH--	105	--BOTH--	52	--BOTH--	84
19	575	111	N	14	--BOTH--	105	SIDE	52	--BOTH--	84
20	468	133	N	11	--BOTH--	105	SIDE	52	SIDE	84
21	373	124	N	13	SIDE	105	SIDE	52	SIDE	84
22	0	0	S	23		105		52		84
23	0	0	S	24		105		52		84

Warrant Summary:

Rural values apply.

Warrant 1 - Minimum Vehicular Volumes

SATISFIED for 14 hours. Criteria--Main St.: 420; Side St.: See Volume Summary.

Warrant 2 - Interruption of Continuous Traffic

SATISFIED for 10 hours. Criteria--Main St.: 630; Side St.: See Volume Summary.

Warrant 3 - Minimum Pedestrian Volumes

NOT SATISFIED. 8th-High Hour--Pedestrians: 0. Criteria--Pedestrians: 105; Vehicles: 420.

Warrant 4 - School Crossing

NOT APPLICABLE. Gap data has not been defined.

Warrant 5 - Progressive Movement

NOT SATISFIED. Adjacent signals closer than 1000 feet and/or not part of coordinated system.

Warrant 6 - Accident Experience

NOT SATISFIED. 0 correctable accidents is fewer than required 5.

Correctable Accidents: 0; Right Angle Accidents: 0; Left Turn Accidents: 0; Other Accidents: 0.

Warrant 7 - Systems Warrant

SATISFIED. Peak hour total entering volume: 1549. Approaches on both streets satisfy one of the following criteria:

- EW- Approaches which are part of the principal through traffic roadway network.
- NS** - Approaches which connect areas of principal traffic generation.
- ~~NS~~ - Approaches which include rural or suburban highways outside, entering or traversing a city.
- Approaches which have surface street freeway or expressway ramp terminals.
- Approaches which appear as a major route in an official transportation plan.

Warrant 8 - Combination of Warrants

SATISFIED for 14 hours. Criteria--Main: 504; Side: See Volume Summary.

Warrant 9 - Four Hour Volumes

SATISFIED for 10 hours.

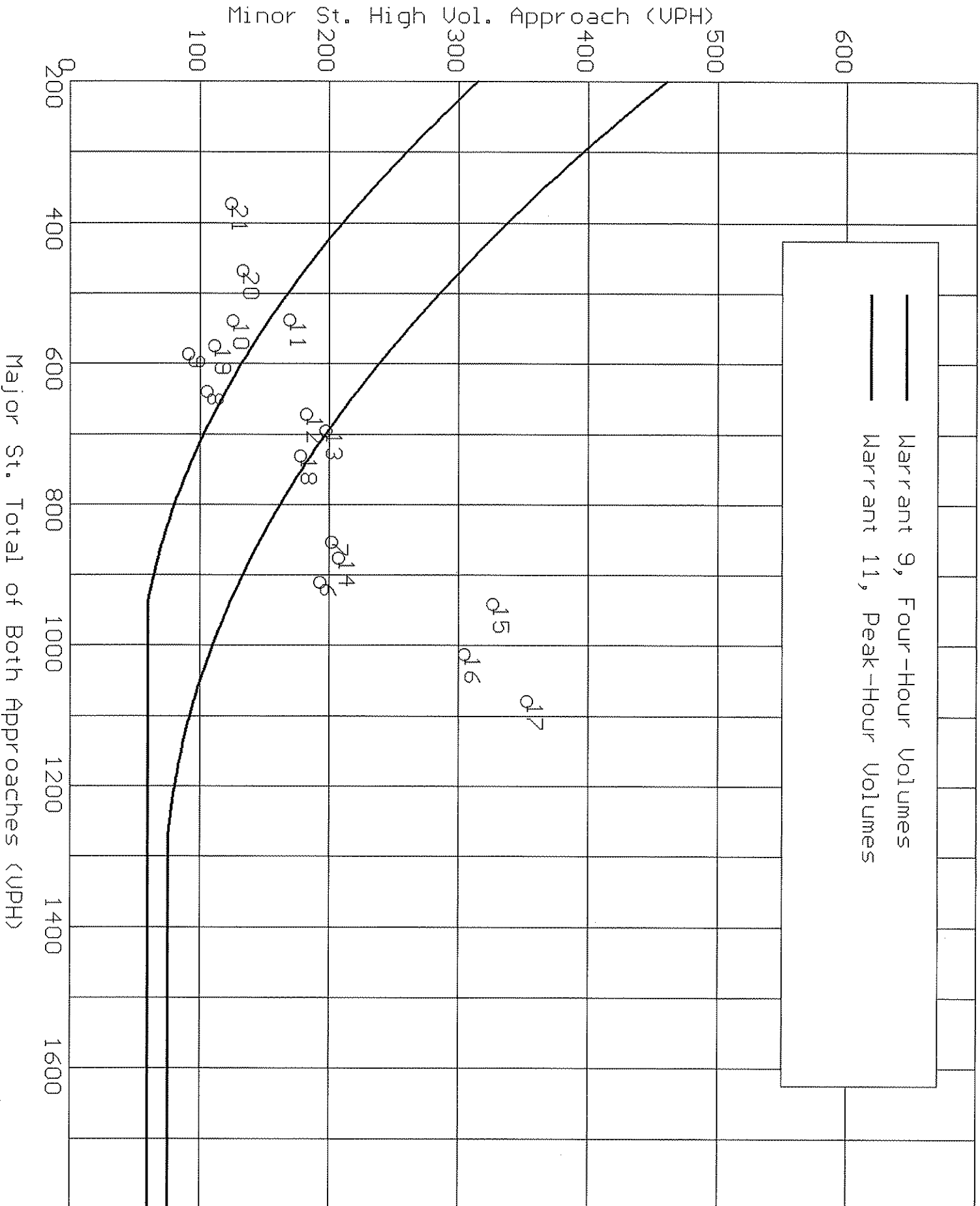
Warrant 10 - Peak Hour Delay

NOT APPLICABLE. Volume requirements satisfied, but side street peak hour delay not defined.

Criteria--Main St.: 800 (4 approaches), 650 (3 approaches); Side St.: 100.

Warrant 11 - Peak Hour Volume

SATISFIED for 7 hours.



Multiway Stop Warrant Analysis
TMC 0125 CSAH 23 @CR 105/I-35W Ramps
Speed Limit of Major Roadway..... 55

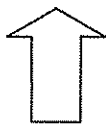
Minimum Traffic Volumes Multiway Stop Warrant Criteria:

- a) The total vehicular volume entering the intersection from all approaches must average at least 500 vehicles per hour (vph) for any 8 hours of an average day, AND:
- b) The combined vehicular and pedestrian volume from the minor street or highway must average at least 200 vph for the same 8 hours, with an average delay to minor street vehicular traffic of at least 30 seconds per vehicle during the maximum hour, BUT:
- c) When the 85-percentile approach speed of the major street traffic exceeds 40 miles per hour, the minimum volume warrant is 70% of the above requirements.

Hour	Total Vehicular Traffic Entering the Intersection	Vehicular Traffic Entering on First Minor Roadway	Vehicular Traffic Entering on Second Minor Roadway	Sum of Minor Approaches	Hours Stop Warrant Met
6 AM - 7 AM	1162	193	58	251	1
7 AM - 8 AM	1115	202	60	262	1
8 AM - 9 AM	836	105	91	196	1
9 AM - 10 AM	756	78	91	169	1
10 AM - 11 AM	759	95	125	220	1
11 AM - 12 PM	792	85	169	254	1
12 PM - 13 PM	931	77	182	259	1
1 PM - 2 PM	991	98	197	295	1
2 PM - 3 PM	1193	110	207	317	1
3 PM - 4 PM	1342	75	326	401	1
4 PM - 5 PM	1422	105	304	409	1
5 PM - 6 PM	1549	117	353	470	1
6 PM - 7 PM	994	85	178	263	1
7 PM - 8 PM	761	75	111	186	1
8 PM - 9 PM	681	80	133	213	1
9 PM - 10 PM	559	62	124	186	1

TOTAL HOURS MET: 16

MULTIWAY STOP WARRANT IS MET



COUNT LOCATION:

CSAH 23

DATE:

8/6/01

CSAH 105 / I-35W Ramps

NORTH

APP. #1 = I-35W Ramps

APP. #2 = CSAH 23

APP. #3 = CSAH 23

APP. #4 = CSAH 105

APP. #2

APP. #1

APP. #3

APP. #4

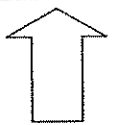
HEAVY VEHICLE- ANY VEHICLE HAVING MORE THAN FOUR TIRES TOUCHING THE PAVEMENT

A. TRUCKS- A HEAVY VEHICLE INVOLVED PRIMARILY IN THE TRANSPORT OF GOODS OR IN THE DELIVERY OF A SERVICE.

B. RV- A HEAVY VEHICLE OPERATED BY A PRIVATE MOTORIST AND INVOLVED IN THE TRANSPORT OF RECREATIONAL EQUIPMENT OR FACILITIES.

C. BUSES- A HEAVY VEHICLE INVOLVED IN THE TRANSPORTATION OF GROUPS OF PEOPLE.

TIME	PEDESTRIANS					HEAVY VEHICLES		
	APP. #1	APP. #2	APP. #3	APP. #4	15 MIN TOT	TRUCKS	RV	BUS
6:00-6:15AM						3		
6:15-6:30						5		3
6:30-6:45						18		3
6:45-7:00		1			1	14		1
HOURLY TOTAL					1	HOURLY TOTAL		47
7:00-7:15						10		
7:15-7:30				1	1	9		1
7:30-7:45						10		1
7:45-8:00						12		
HOURLY TOTAL					1	HOURLY TOTAL		43
8:00-8:15						17		
8:15-8:30						16		
8:30-8:45						20		
8:45-9:00		1			1	22		
HOURLY TOTAL					1	HOURLY TOTAL		75
9:00-9:15						24		
9:15-9:30						13		
9:30-9:45						15		
9:45-10:00						13		
HOURLY TOTAL						HOURLY TOTAL		65
10:00-10:15						9		
10:15-10:30						23	1	
10:30-10:45						20		
10:45-11:00						18		
HOURLY TOTAL						HOURLY TOTAL		71
11:00-11:15						20		
11:15-11:30						22		
11:30-11:45		1		1	2	8		
11:45-12:00						10		
HOURLY TOTAL					2	HOURLY TOTAL		60
12:00-12:15						18		
12:15-12:30						17		
12:30-12:45						18		1
12:45-1:00						21		
HOURLY TOTAL						HOURLY TOTAL		75
1:00-1:15						18		
1:15-1:30						23		
1:30-1:45						20		
1:45-2:00						23		
HOURLY TOTAL						HOURLY TOTAL		84



NORTH

COUNT LOCATION:

CSAH 23

DATE:

8/6/01

CSAH 105 / I-35W Ramps

APP. #1 = I-35W Ramps

APP. #2 = CSAH 23

APP. #3 = CSAH 23

APP. #4 = CSAH 105

APP. #2

APP. #1

APP. #3

APP. #4

HEAVY VEHICLE- ANY VEHICLE HAVING MORE THAN FOUR TIRES TOUCHING THE PAVEMENT

- A. TRUCKS- A HEAVY VEHICLE INVOLVED PRIMARILY IN THE TRANSPORT OF GOODS OR IN THE DELIVERY OF A SERVICE.
- B. RV- A HEAVY VEHICLE OPERATED BY A PRIVATE MOTORIST AND INVOLVED IN THE TRANSPORT OF RECREATIONAL EQUIPMENT OR FACILITIES.
- C. BUSES- A HEAVY VEHICLE INVOLVED IN THE TRANSPORTATION OF GROUPS OF PEOPLE.

TIME	PEDESTRIANS					HEAVY VEHICLES		
	APP. #1	APP. #2	APP. #3	APP. #4	15 MIN TOT	TRUCKS	RV	BUS
2:00-2:15PM						18		
2:15-2:30						17		
2:30-2:45						20		
2:45-3:00						22		
HOURLY TOTAL						HOURLY TOTAL		77
3:00-3:15						18		1
3:15-3:30						15		
3:30-3:45						18		
3:45-4:00						13		1
HOURLY TOTAL						HOURLY TOTAL		66
4:00-4:15						19		
4:15-4:30						21		
4:30-4:45						5		
4:45-5:00						13		2
HOURLY TOTAL						HOURLY TOTAL		60
5:00-5:15						18		1
5:15-5:30				1	1	12		1
5:30-5:45						10		
5:45-6:00						14		
HOURLY TOTAL					1	HOURLY TOTAL		56
6:00-6:15		1			1	13		1
6:15-6:30						4		
6:30-6:45						8		1
6:45-7:00						7		
HOURLY TOTAL					1	HOURLY TOTAL		34
7:00-7:15						6		1
7:15-7:30		3			3	6		
7:30-7:45						3		
7:45-8:00						5		
HOURLY TOTAL					3	HOURLY TOTAL		21
8:00-8:15		2	1	1	4	1		
8:15-8:30		1			1	6		
8:30-8:45				2	2	4		
8:45-9:00		2			2	3		
HOURLY TOTAL					9	HOURLY TOTAL		14
9:00-9:15						4		
9:15-9:30								
9:30-9:45						2		
9:45-10:00						1		
HOURLY TOTAL						HOURLY TOTAL		7