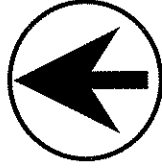


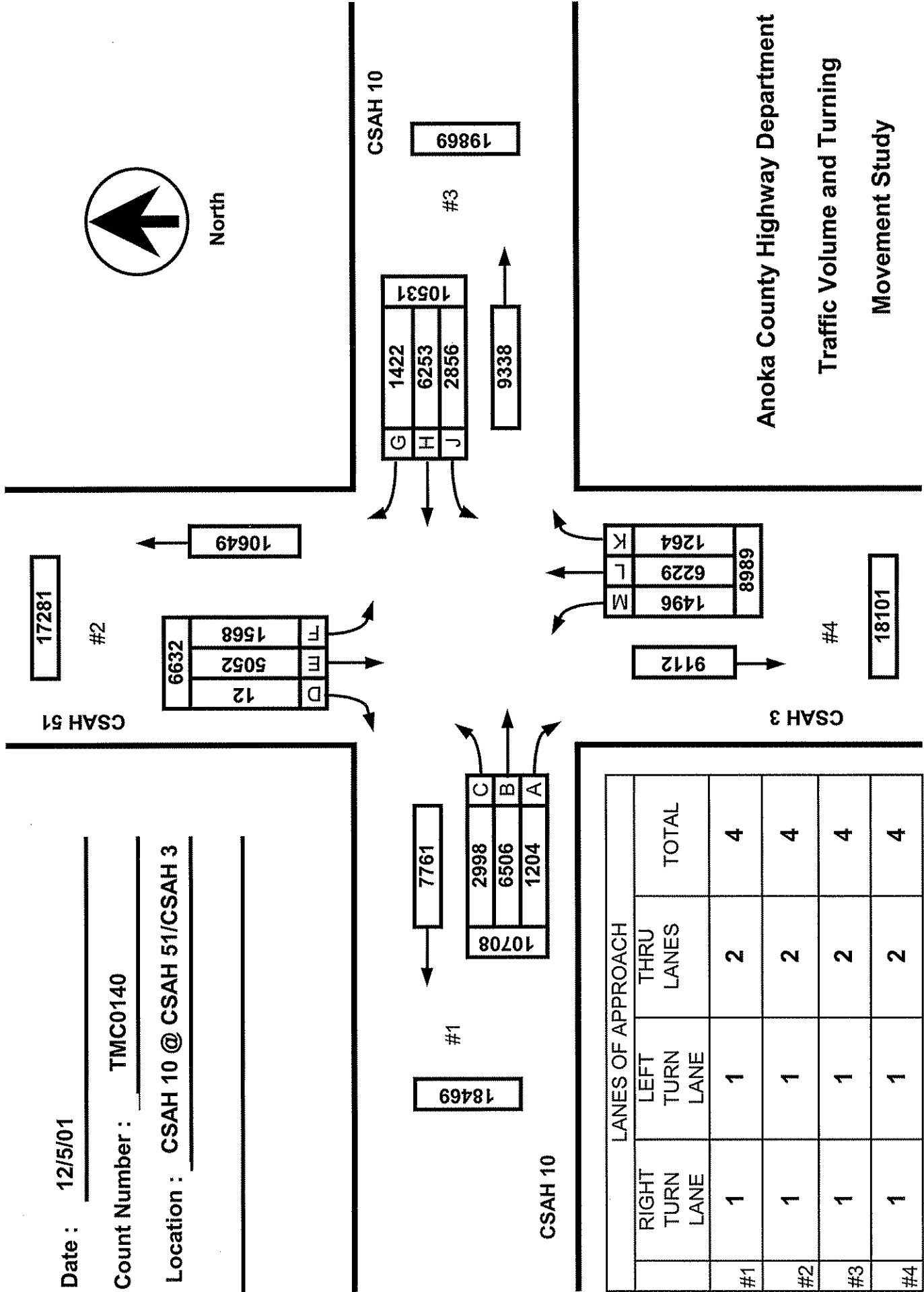
Date : 12/5/01

Count Number : TMC0140

Location : CSAH 10 @ CSAH 51/CSAH 3



North



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

Anoka County Highway Department  
Traffic Volume and Turning  
Movement Study

18101

18469

#1

10708	A	1204
6506	B	6506
2998	C	2998

7761

17281

#2

12	D	5052
1568	E	5052
6632	F	1568

10649

1422	G	10531
6253	H	6253
2856	J	2856

#3

19869

9338

1496	M	8989
6229	L	6229
1264	K	1264

9112

#4

CSAH 10

CSAH 51

CSAH 3

CSAH 10

Anoka County Highway Department  
Traffic Engineering  
Traffic Volume and Turning Movement Stud

Weather: Sunny and Mild  
Counter TDC-8  
Counted by: Josie / Sean

File Name : TMC0140  
Site Code : 01400201  
Start Date : 12/06/2001  
Page No : 1

Groups Printed- Unshifted

Start Time	CSAH 51 Southbound					CSAH 10 Westbound					CSAH 3 Northbound					CSAH 10 Eastbound					Exclu. Total	Inclu. Total	Int. Total					
	Left	Thru	Right	Heavy	App. Total	Left	Thru	Right	Heavy	App. Total	Left	Thru	Right	Heavy	App. Total	Left	Thru	Right	Heavy	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		1.0	1.0	1.0	1.0				
06:00	19	98	0	1	117	12	23	1	2	36	1	13	5	2	19	7	56	2	2	65	7	237	244					
06:15	36	125	1	0	162	12	48	4	6	64	1	13	5	2	19	14	106	3	7	123	15	368	383					
06:30	62	146	0	0	208	12	48	6	3	66	2	15	5	1	22	12	137	8	7	157	11	453	464					
06:45	59	159	0	3	218	8	73	6	8	87	1	26	4	4	31	7	165	9	8	181	23	517	540					
Total	176	528	1	4	705	44	192	17	19	253	5	67	19	9	91	40	464	22	24	526	56	1575	1631					
07:00	70	134	0	3	204	23	45	3	3	71	1	21	11	3	33	14	139	4	3	157	12	465	477					
07:15	50	161	1	3	212	29	61	8	1	98	3	30	5	2	38	24	201	6	5	231	11	579	590					
07:30	58	135	0	4	193	32	84	4	3	120	1	33	8	3	42	35	183	7	7	225	17	580	597					
07:45	43	119	0	3	162	20	98	7	7	125	1	38	9	3	48	38	168	12	7	218	20	553	573					
Total	221	549	1	13	771	104	288	22	14	414	6	122	33	11	161	111	691	29	22	831	60	2177	2237					
08:00	24	95	0	3	119	28	66	11	2	105	3	25	6	3	34	23	103	13	4	139	12	397	409					
08:15	18	82	0	3	100	26	70	7	4	103	2	37	13	3	52	38	106	10	5	154	15	409	424					
08:30	17	60	0	0	77	17	76	7	5	100	6	31	7	2	44	32	77	9	1	118	8	339	347					
08:45	31	58	0	1	89	31	75	9	9	115	5	29	6	2	40	36	109	9	7	154	19	398	417					
Total	90	295	0	7	385	102	287	34	20	423	16	122	32	10	170	129	395	41	17	565	54	1543	1597					
09:00	21	62	0	2	83	24	66	9	6	99	12	43	11	4	66	30	87	18	4	135	16	383	399					
09:15	29	77	0	3	106	41	70	10	3	121	19	37	11	1	67	41	69	22	1	132	8	426	434					
09:30	20	72	0	4	92	49	91	13	9	153	12	45	12	8	69	48	97	24	4	169	25	483	508					
09:45	31	87	0	5	118	35	71	4	7	110	13	60	27	3	100	36	104	38	8	178	23	506	529					
Total	101	298	0	14	399	149	298	36	25	483	56	185	61	16	302	155	357	102	17	614	72	1798	1870					
10:00	18	59	0	3	77	48	95	19	12	162	6	71	18	6	95	53	92	45	10	190	31	524	555					
10:15	32	59	0	6	91	58	84	24	6	166	11	57	27	9	95	34	80	26	3	140	24	492	516					
10:30	19	56	0	4	75	44	95	10	9	149	22	67	24	3	113	57	126	33	3	216	19	553	572					
10:45	19	68	0	4	87	39	86	14	4	139	27	74	29	3	130	59	113	51	4	223	15	579	594					
Total	88	242	0	17	330	189	360	67	31	616	66	269	98	21	433	203	411	155	20	769	89	2148	2237					
11:00	16	85	0	4	101	32	91	10	5	133	37	94	18	3	149	61	92	37	1	190	13	573	586					
11:15	21	70	0	2	91	39	108	25	7	172	32	103	23	5	158	54	111	30	10	195	24	616	640					
11:30	20	74	2	4	96	53	77	14	7	144	26	110	30	7	166	76	131	55	12	262	30	668	698					
11:45	25	89	0	2	114	58	103	26	6	187	53	112	40	10	205	75	118	39	3	232	21	738	759					
Total	82	318	2	12	402	182	379	75	25	636	148	419	111	25	678	266	452	161	26	879	88	2595	2683					
12:00	22	88	0	2	110	76	115	22	2	213	44	153	31	10	228	82	98	40	4	220	18	771	789					
12:15	9	100	0	2	109	73	139	26	3	238	43	120	28	4	191	73	148	24	5	245	14	783	797					
12:30	24	75	1	3	100	68	114	16	5	198	44	110	34	3	188	75	109	39	4	223	15	709	724					
12:45	39	115	1	6	155	62	111	18	8	191	40	139	26	6	205	55	118	26	5	199	25	750	775					
Total	94	378	2	13	474	279	479	82	18	840	171	522	119	23	812	285	473	129	18	887	72	3013	3085					
13:00	24	104	1	1	129	89	122	26	6	237	32	111	43	6	186	70	104	28	7	202	20	754	774					
13:15	20	78	0	3	98	79	109	15	11	203	36	122	36	3	194	63	114	28	9	205	26	700	726					
13:30	18	83	0	2	101	75	129	12	4	216	35	127	32	4	194	67	111	26	4	204	14	715	729					
13:45	30	79	0	4	109	73	123	21	8	217	30	144	23	3	197	40	109	23	4	172	19	695	714					
Total	92	344	1	10	437	316	483	74	29	873	133	504	134	16	771	240	438	105	24	783	79	2864	2943					
14:00	23	93	0	2	116	43	123	32	6	198	30	158	26	5	214	71	120	0	2	191	15	719	734					
14:15	21	92	0	5	113	55	123	28	2	206	12	127	39	3	178	75	149	0	4	224	14	721	735					
14:30	30	82	0	2	112	51	149	40	7	240	40	171	22	1	233	61	94	1	5	156	15	741	756					
14:45	24	76	0	3	100	63	149	29	5	241	30	140	20	3	190	75	129	0	6	204	17	735	752					
Total	98	343	0	12	441	212	544	129	20	885	112	596	107	12	815	282	492	1	17	775	61	2916	2977					
15:00	25	70	2	1	97	54	139	50	4	243	32	208	28	3	268	62	127	6	2	195	10	803	813					
15:15	25	97	0	2	122	63	170	39	9	272	22	149	24	4	195	50	118	25	4	193	19	782	801					
15:30	18	78	0	2	96	44	141	56	4	241	42	205	30	1	277	69	134	14	1	217	8	831	839					
15:45	25	87	0	2	112	62	156	46	5	264	29	180	34	3	243	79	155	28	4	262	14	881	895					
Total	93	332	2	7	427	223	606	191	22	1020	125	742	116	11	983	260	534	73	11	867	51	3297	3348					
16:00	23	84	0	2	107	44	162	54	7	260	49	189	17	2	255	74	120	20	3	214	14	836	850					
16:15	30	94	0	2	124	61	180	52	5	293	41	209	28	3	278	64	135	19	1	218	11	913	924					
16:30	26	85	0	1	111	73	198	49	6	320	48	195	29	1	272	80	146	21	1	247	9	950	959					
16:45	38	95	0	1	133	68	198	52	2	318	40	210	32	1	282	87	132	18	3	237	7	970	977					
Total	117	358	0	6	475	246	738	207	20	1191	178	803	106	7	1087	305	533	78	8	916	41	3669	3710					



Major Street Approaches:

Eastbound:

CSAH 10

Data File: E:\2001 COUNT FILES\TMC0140.war  
 Count Type: IMC. Channel: 0. Count Date: 12/ 6/ 1  
 Number of Lanes: 2  
 Approach Speed: 50  
 Total Approach Traffic: 10708

Westbound:

CSAH 10

Data File: E:\2001 COUNT FILES\TMC0140.war  
 Count Type: IMC. Channel: 0. Count Date: 12/ 6/ 1  
 Number of Lanes: 2  
 Approach Speed: 50  
 Total Approach Traffic: 10531

Minor Street Approaches:

Northbound:

CSAH 3

Data File: E:\2001 COUNT FILES\TMC0140.war  
 Count Type: IMC. Channel: 0. Count Date: 12/ 6/ 1  
 Number of Lanes: 2  
 Approach Speed: 35  
 Total Approach Traffic: 8989

Southbound:

CSAH 51

Data File: E:\2001 COUNT FILES\TMC0140.war  
 Count Type: IMC. Channel: 0. Count Date: 12/ 6/ 1  
 Number of Lanes: 2  
 Approach Speed: 35  
 Total Approach Traffic: 6632

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

Hour	Main	Side	Warrant 1	Warrant 2	Warrant 8
Begin	(Total)	Vol. Dir. Rank	Meets? Criteria	Meets? Criteria	Meets? Criteria
0	0	0 S 15	140	70	112
1	0	0 S 16	140	70	112
2	0	0 S 17	140	70	112
3	0	0 S 18	140	70	112
4	0	0 S 19	140	70	112
5	0	0 S 20	140	70	112
6	779	705 S 9	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
7	1245	771 S 7	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
8	988	385 S 14	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
9	1097	399 S 13	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
10	1385	433 N 12	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
11	1515	678 N 10	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
12	1727	812 N 6	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
13	1656	771 N 8	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
14	1660	815 N 5	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
15	1887	983 N 4	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
16	2107	1087 N 1	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
17	2136	1061 N 2	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
18	1728	1003 N 3	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
19	1329	622 N 11	--BOTH-- 140	--BOTH-- 70	--BOTH-- 112
20	0	0 S 21	140	70	112
21	0	0 S 22	140	70	112
22	0	0 S 23	140	70	112
23	0	0 S 24	140	70	112

## Warrant Summary:

Rural values apply.

A high-volume minor approach is wide enough for two lanes. Re-striping may be desirable.

## 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 14 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: 3672. Approaches on both streets satisfy one of the following criteria:

- SEW- Approaches which are part of the principal through traffic roadway network.
- Approaches which connect areas of principal traffic generation.
- N - 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 14 hours.

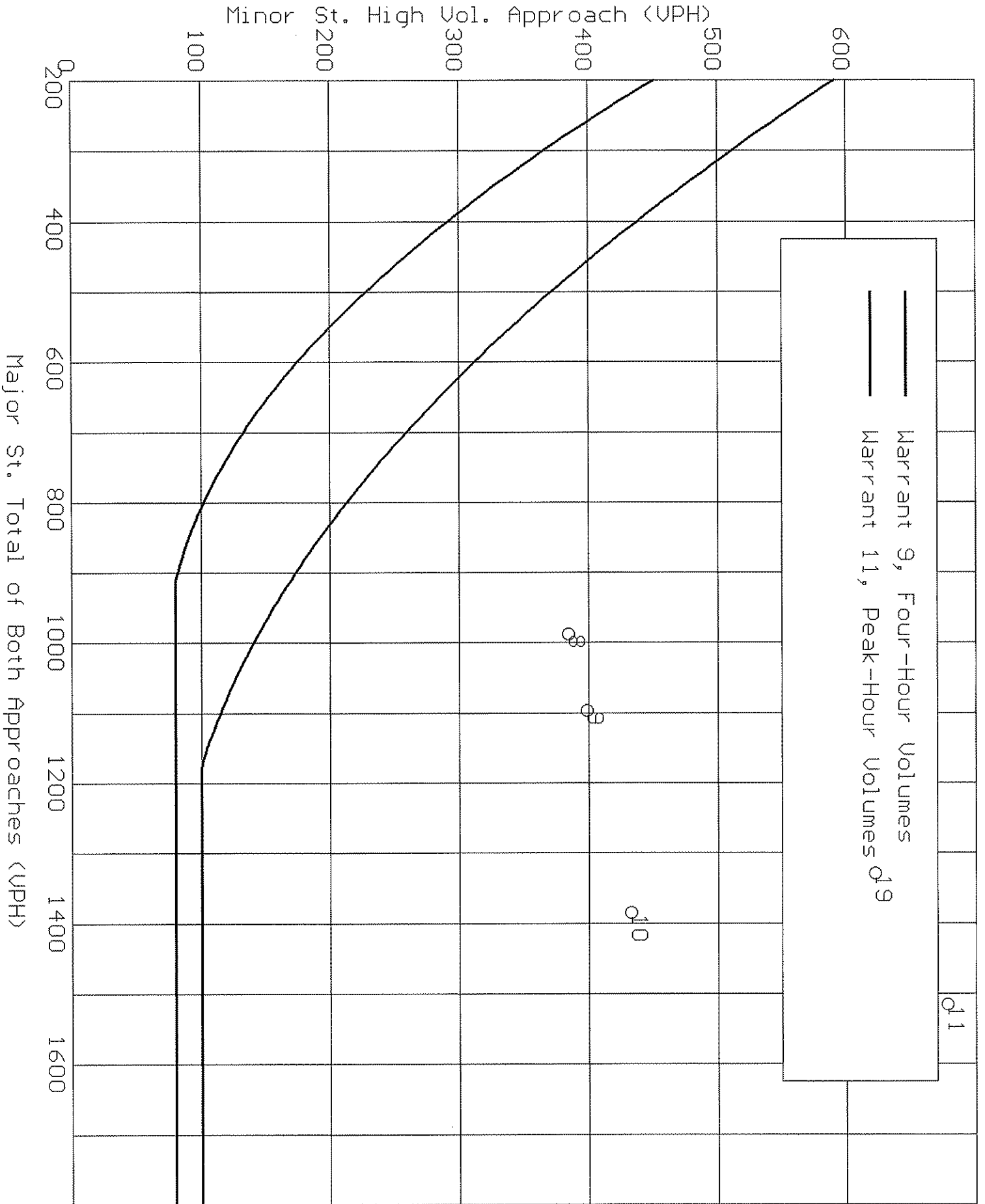
## Warrant 10 - Peak Hour Delay

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

Criteria--Main St.: 800 (4 approaches), 650 (3 approaches); Side St.: 150.

## Warrant 11 - Peak Hour Volume

SATISFIED for 14 hours.



**Multiway Stop Warrant Analysis**  
**TMC 0140 CSAH 10 @ CSAH 51/CSAH 3**  
**Speed Limit of Major Roadway..... 50**

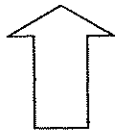
**Minimum Traffic Volumes Multiway Stop Warrant Criteria:**

- 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	1575	705	91	796	1
7 AM - 8 AM	2177	771	161	932	1
8 AM - 9 AM	1543	385	170	555	1
9 AM - 10 AM	1798	399	302	701	1
10 AM - 11 AM	2148	330	433	763	1
11 AM - 12 PM	2595	402	678	1080	1
12 PM - 13 PM	3013	474	812	1286	1
1 PM - 2 PM	2864	437	771	1208	1
2 PM - 3 PM	2916	441	815	1256	1
3 PM - 4 PM	3297	427	983	1410	1
4 PM - 5 PM	3669	475	1087	1562	1
5 PM - 6 PM	3672	475	1061	1536	1
6 PM - 7 PM	3241	510	1003	1513	1
7 PM - 8 PM	2352	401	622	1023	1

**TOTAL HOURS MET: 14**

**MULTIWAY STOP WARRANT IS MET**



NORTH

COUNT LOCATION:

CSAH 10 @

DATE:

12/6/01

CSAH 51/CSAH 3

APP. #1= CSAH 10

APP. #2 = CSAH 51

APP. #3= CSAH 10

APP. #4= CSAH 3

APP. #2

APP. #1

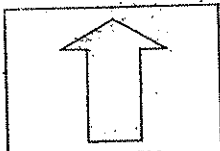
APP. #3

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						6		1
6:15-6:30						15		
6:30-6:45						10		1
6:45-7:00						21		2
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>56</b>
7:00-7:15						11		1
7:15-7:30			1		1	7		4
7:30-7:45						16		1
7:45-8:00			2		2	19		2
<b>HOURLY TOTAL</b>					<b>3</b>	<b>HOURLY TOTAL</b>		<b>61</b>
8:00-8:15						8		4
8:15-8:30						12		3
8:30-8:45						7		1
8:45-9:00			1		1	16		3
<b>HOURLY TOTAL</b>					<b>1</b>	<b>HOURLY TOTAL</b>		<b>54</b>
9:00-9:15						12		4
9:15-9:30						7		1
9:30-9:45						23		1
9:45-10:00						20	1	2
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>71</b>
10:00-10:15			1		1	26		5
10:15-10:30						18		4
10:30-10:45						19		
10:45-11:00						13		2
<b>HOURLY TOTAL</b>					<b>1</b>	<b>HOURLY TOTAL</b>		<b>87</b>
11:00-11:15						12		1
11:15-11:30						22		2
11:30-11:45						29		1
11:45-12:00						20		2
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>89</b>
12:00-12:15						16		1
12:15-12:30	1				1	14		
12:30-12:45						13		1
12:45-1:00	1				1	24		
<b>HOURLY TOTAL</b>					<b>2</b>	<b>HOURLY TOTAL</b>		<b>69</b>
1:00-1:15						18		2
1:15-1:30						25		1
1:30-1:45						14		
1:45-2:00	1				1	17	1	1
<b>HOURLY TOTAL</b>					<b>1</b>	<b>HOURLY TOTAL</b>		<b>79</b>





COUNT LOCATION:

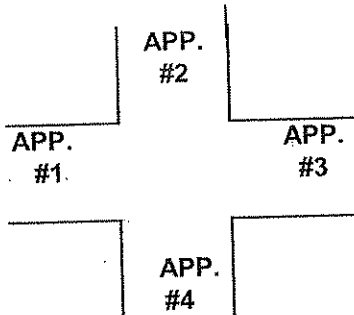
CSAH 10 @

DATE:

12/5/01

CSAH 51/CSAH 3

<b>NORTH</b>
APP. #1 = CSAH 10
APP. #2 = CSAH 51
APP. #3 = CSAH 10
APP. #4 = CSAH 3



- 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						12		4
2:15-2:30						14		
2:30-2:45	1				1	11		3
2:45-3:00						14		2
<b>HOURLY TOTAL</b>					<b>1</b>	<b>HOURLY TOTAL</b>		<b>60</b>
3:00-3:15	1				1	5		5
3:15-3:30						17		2
3:30-3:45				1	1	7		1
3:45-4:00						9		4
<b>HOURLY TOTAL</b>					<b>2</b>	<b>HOURLY TOTAL</b>		<b>50</b>
4:00-4:15			2		2	12		2
4:15-4:30			2		2	8		3
4:30-4:45			2		2	7		
4:45-5:00			3		3	6		2
<b>HOURLY TOTAL</b>					<b>9</b>	<b>HOURLY TOTAL</b>		<b>40</b>
5:00-5:15								2
5:15-5:30						2		
5:30-5:45						5		1
5:45-6:00						5		1
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>16</b>
6:00-6:15			1		1	3		
6:15-6:30						4		1
6:30-6:45						1		
6:45-7:00						2		1
<b>HOURLY TOTAL</b>					<b>1</b>	<b>HOURLY TOTAL</b>		<b>12</b>
7:00-7:15						1		2
7:15-7:30						2		
7:30-7:45						1		
7:45-8:00						1		1
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>8</b>