

Date : 7/20/04

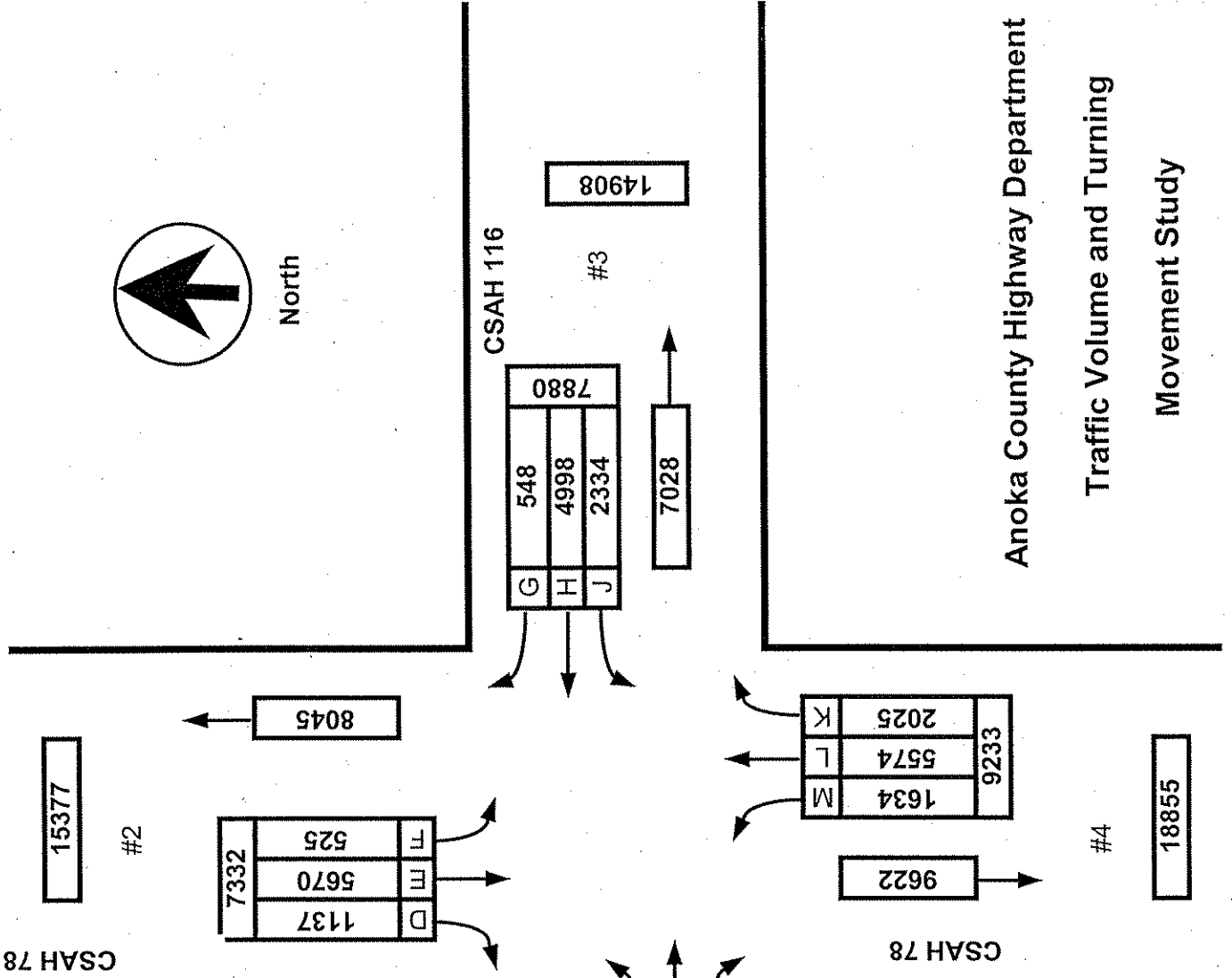
Count Number : TMC0419

Location : CSAH 78 (Hanson Blvd.)

@ CSAH 116 (Bunker Lk. Blvd.)



North



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

Anoka County Highway Department  
 Traffic Volume and Turning  
 Movement Study

15377

#2

7332	525	T
5670		M
1137		D

8045

548	7880
4998	
2334	

#3

7028

14908

2025	9233
5574	
1634	

9622

#4

18855

15788	#1	7769
8019	C	1923
	B	4478
	A	1618

CSAH 116

CSAH 78



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

File Name : TMC0419  
 Site Code : 04190101  
 Start Date : 07/20/2004  
 Page No : 2

Weather: Sunny & Warm  
 nter: TDC-8  
 Counted by: Katelyn/Kyle

Groups Printed- 1 - Unshifted

Start Time	CSAH 78 Southbound					CSAH 116 Westbound					CSAH 78 Northbound					CSAH 116 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				
18:00	9	84	15	2	108	54	120	12	3	186	49	123	50	1	222	38	105	32	4	175	10	691	701
18:15	5	97	18	0	120	38	99	6	0	143	38	117	51	0	206	38	86	23	0	147	0	616	616
18:30	10	76	14	1	100	29	85	13	0	127	30	136	41	4	207	42	60	27	1	129	6	563	569
18:45	5	85	20	5	110	29	83	8	2	120	44	105	44	4	193	36	68	27	0	131	11	554	565
Total	29	342	67	8	438	150	387	39	5	576	161	481	186	9	828	154	319	109	5	582	27	2424	2451
19:00	9	60	29	2	98	42	110	13	1	165	32	89	35	1	156	27	96	21	1	144	5	563	568
19:15	9	69	22	2	100	25	83	7	2	115	27	86	36	1	149	41	65	27	1	133	6	497	503
19:30	4	63	18	0	85	19	74	5	1	98	26	79	22	1	127	38	59	36	1	133	3	443	446
19:45	4	33	15	0	52	25	65	4	0	94	21	78	25	1	124	29	59	18	2	106	3	376	379
Total	26	225	84	4	335	111	332	29	4	472	106	332	118	4	556	135	279	102	5	516	17	1879	1896
20:00	4	52	11	0	67	26	70	11	1	107	24	105	26	2	155	48	61	23	0	132	3	461	464
20:15	6	56	18	0	80	21	49	7	1	77	36	87	29	3	152	39	85	18	1	142	5	451	456
20:30	2	39	12	2	53	28	51	10	0	89	25	91	27	1	143	35	65	17	1	117	4	402	406
20:45	11	35	17	0	63	30	84	5	1	119	34	63	20	1	117	46	68	11	0	125	2	424	426
Total	23	182	58	2	263	105	254	33	3	392	119	346	102	7	567	168	279	69	2	516	14	1738	1752
21:00	6	38	16	3	60	20	59	11	0	90	42	112	29	1	183	43	77	35	1	155	5	488	493
21:15	8	60	21	1	89	28	57	5	2	90	32	123	24	1	179	36	59	26	1	121	5	479	484
21:30	4	44	11	0	59	13	56	4	0	73	29	69	18	0	116	31	37	25	1	93	1	341	342
21:45	6	41	17	0	64	21	47	6	2	74	19	74	17	1	110	27	41	14	0	82	3	330	333
Total	24	183	65	4	272	82	219	26	4	327	122	378	88	3	588	137	214	100	3	451	14	1638	1652
Grand Total	525	567	113	240	7332	233	499	548	305	7880	163	557	202	300	9233	192	447	161	385	8019	1230	32464	33694
Apprch %	7.2	77.3	15.5			29.6	63.4	7.0			17.7	60.4	21.9			24.0	55.8	20.2					
Total %	1.6	17.5	3.5		22.6	7.2	15.4	1.7		24.3	5.0	17.2	6.2		28.4	5.9	13.8	5.0		24.7	3.7	96.3	

**ANOKA COUNTY HIGHWAY**  
**PC-WARRANTS**  
**TRAFFIC SIGNAL WARRANT ANALYSIS**

Study Name : TMC0419  
 Study Date : 07/23/04  
 Page No. : 1

**Signal Warrants - Summary**

**Major Street Approaches**

**Northbound: CSAH 78**  
 Number of Lanes: 2  
 Approach Speed: 55  
 Total Approach Volume: 9,233

**Southbound: CSAH 78**  
 Number of Lanes: 2  
 Approach Speed: 55  
 Total Approach Volume: 7,332

**Minor Street Approaches**

**Eastbound: CSAH 116**  
 Number of Lanes: 2  
 Total Approach Volume: 8,019

**Westbound: CSAH 116**  
 Number of Lanes: 2  
 Total Approach Volume: 7,880

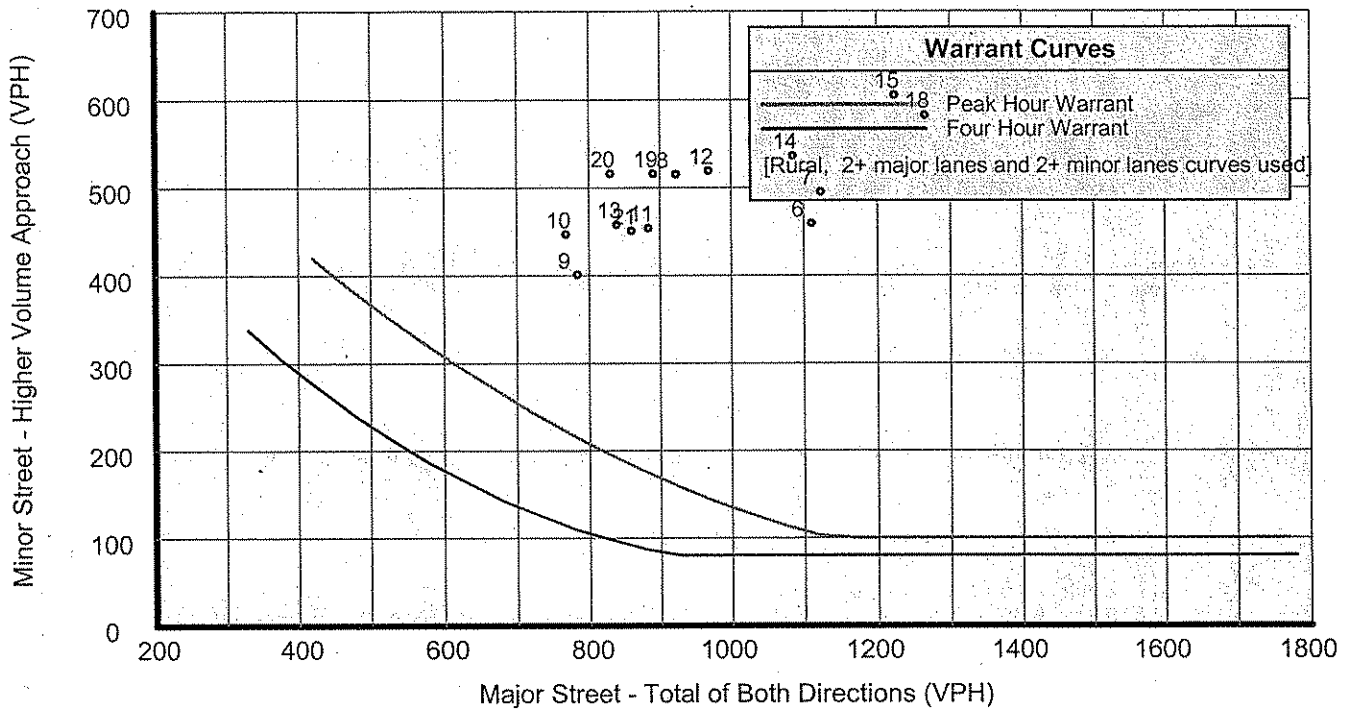
**Warrant Summary (Rural values apply.)**

<b>Warrant 1 - Eight Hour Vehicular Volumes</b> .....	<b>Satisfied</b>
<b>Warrant 1A - Minimum Vehicular Volume</b> .....	<b>Satisfied</b>
Required volumes reached for 16 hours, 8 are needed	
<b>Warrant 1B - Interruption of Continuous Traffic</b> .....	<b>Satisfied</b>
Required volumes reached for 16 hours, 8 are needed	
<b>Warrant 1 A&amp;B - Combination of Warrants</b> .....	<b>Satisfied</b>
Required volumes reached for 16 hours, 8 are needed	
<b>Warrant 2 - Four Hour Volumes</b> .....	<b>Satisfied</b>
Number of hours (16) volumes exceed minimum >= minimum required (4).	
<b>Warrant 3 - Peak Hour</b> .....	<b>Satisfied</b>
<b>Warrant 3A - Peak Hour Volumes</b> .....	<b>Satisfied</b>
Volumes exceed minimums for at least one hour.	
<b>Warrant 3B - Peak Hour Delay</b> .....	<b>Satisfied</b>
Number of hours (64) volumes exceed minimum >= required (1). Delay data not evaluated.	
<b>Warrant 4 - Pedestrian Volumes</b> .....	<b>Not Evaluated</b>
<b>Warrant 5 - School Crossing</b> .....	<b>Not Evaluated</b>
<b>Warrant 6 - Coordinated Signal System</b> .....	<b>Not Evaluated</b>
<b>Warrant 7 - Crash Experience</b> .....	<b>Not Evaluated</b>
<b>Warrant 8 - Roadway Network</b> .....	<b>Not Evaluated</b>

# ANOKA COUNTY HIGHWAY PC-WARRANTS TRAFFIC SIGNAL WARRANT ANALYSIS

Study Name : TMC0419  
Study Date : 07/23/04  
Page No. : 2

## Signal Warrants - Summary



### Analysis of 8-Hour Volume Warrants:

Hour Begin	Major Total	Higher Minor Vol	Dir	War-1A			War-1B			War-1A&B		
				Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?
00:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
01:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
02:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
03:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
04:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
05:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
06:00	1,111	459	WB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
07:00	1,124	495	WB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
08:00	923	515	WB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
09:00	784	401	WB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
10:00	768	447	WB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
11:00	884	454	EB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
12:00	969	519	EB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
13:00	839	458	EB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
14:00	1,086	536	EB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
15:00	1,224	605	WB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
16:00	1,432	722	EB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
17:00	1,574	748	WB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
18:00	1,266	582	EB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
19:00	891	516	EB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
20:00	830	516	EB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
21:00	860	451	EB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
22:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
23:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---

**ANOKA COUNTY HIGHWAY  
PC-WARRANTS  
TRAFFIC SIGNAL WARRANT ANALYSIS**

Study Name : TMC0419  
Study Date : 07/23/04

**Multi-Way Stop Warrant Report**

**Major Street Approaches**

**Northbound: CSAH 78**  
Total Approach Volume: 9,233  
Approach Speed: 55

**Southbound: CSAH 78**  
Total Approach Volume: 7,332  
Approach Speed: 55

**Minor Street Approaches**

**Eastbound: CSAH 116**  
Total Approach Volume: 8,019

**Westbound: CSAH 116**  
Total Approach Volume: 7,880

**Warrant Summary**

**Criteria A - Interim Measure** ..... Not Evaluated  
If traffic signals are justified, stop signs can be installed as an interim measure.

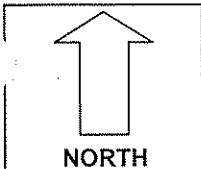
**Criteria B - Crash Experience** ..... Not Evaluated  
Number of crashes (0) is less than the minimum required (5).

**Criteria C - Minimum Volumes and Delays** ..... Satisfied  
Delay data not evaluated  
Required volumes reached for 16 hours, 8 are needed

**Criteria D - 80% of Volumes, Delays, and Crashes** ..... Not Evaluated  
Delay data not evaluated  
Required volumes reached for 16 hours, 8 are needed

**Analysis of 8-Hour Volume Warrants:**

Time	Major Crit Total	Minor Total	Crit C			Crit D		
			Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?
00:00 - 01:00	0	0	210-No	140-No	No	240-No	160-No	No
01:00 - 02:00	0	0	210-No	140-No	No	240-No	160-No	No
02:00 - 03:00	0	0	210-No	140-No	No	240-No	160-No	No
03:00 - 04:00	0	0	210-No	140-No	No	240-No	160-No	No
04:00 - 05:00	0	0	210-No	140-No	No	240-No	160-No	No
05:00 - 06:00	0	0	210-No	140-No	No	240-No	160-No	No
06:00 - 07:00	1,111	845	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
07:00 - 08:00	1,124	958	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
08:00 - 09:00	923	883	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
09:00 - 10:00	784	767	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
10:00 - 11:00	768	878	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
11:00 - 12:00	884	890	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
12:00 - 13:00	969	993	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
13:00 - 14:00	839	867	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
14:00 - 15:00	1,086	1,029	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
15:00 - 16:00	1,224	1,186	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
16:00 - 17:00	1,432	1,353	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
17:00 - 18:00	1,574	1,418	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
18:00 - 19:00	1,266	1,158	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
19:00 - 20:00	891	988	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
20:00 - 21:00	830	908	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
21:00 - 22:00	860	778	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
22:00 - 23:00	0	0	210-No	140-No	No	240-No	160-No	No
23:00 - 00:00	0	0	210-No	140-No	No	240-No	160-No	No



COUNT LOCATION:

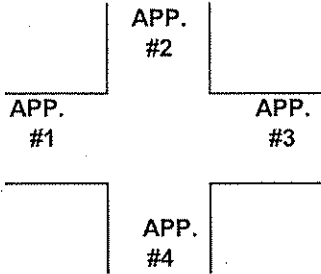
CSAH 78 (Hanson Blvd.) @

DATE:

07/20/2004

CSAH 116 (Bunker Lk. Blvd.)

APP. #1 = CSAH 116
APP. #2 = CSAH 78
APP. #3 = CSAH 116
APP. #4 = CSAH 78



- 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	2			1	3	12		
6:15-6:30						10	1	2
6:30-6:45	1	1			2	21		7
6:45-7:00	2				2	14		20
<b>HOURLY TOTAL</b>					<b>7</b>	<b>HOURLY TOTAL</b>		<b>87</b>
7:00-7:15						12		10
7:15-7:30						20		4
7:30-7:45	1	1		1	3	20		20
7:45-8:00						10		12
<b>HOURLY TOTAL</b>					<b>3</b>	<b>HOURLY TOTAL</b>		<b>108</b>
8:00-8:15				1	1	20	1	5
8:15-8:30						29		10
8:30-8:45						19		4
8:45-9:00						18		8
<b>HOURLY TOTAL</b>					<b>1</b>	<b>HOURLY TOTAL</b>		<b>114</b>
9:00-9:15				1	1	19		5
9:15-9:30						14	1	1
9:30-9:45						21		
9:45-10:00						25		
<b>HOURLY TOTAL</b>					<b>1</b>	<b>HOURLY TOTAL</b>		<b>86</b>
10:00-10:15						19		1
10:15-10:30		1			1	19		
10:30-10:45						26		6
10:45-11:00						17		29
<b>HOURLY TOTAL</b>					<b>1</b>	<b>HOURLY TOTAL</b>		<b>117</b>
11:00-11:15				1	1	15		8
11:15-11:30						23		4
11:30-11:45			2	2	4	21	2	13
11:45-12:00						31		3
<b>HOURLY TOTAL</b>					<b>5</b>	<b>HOURLY TOTAL</b>		<b>120</b>
12:00-12:15						18		3
12:15-12:30	2	2			4	24		3
12:30-12:45	1				1	27		11
12:45-1:00	1				1	27		3
<b>HOURLY TOTAL</b>					<b>6</b>	<b>HOURLY TOTAL</b>		<b>116</b>
1:00-1:15						22		3
1:15-1:30			2	2	4	17		1
1:30-1:45						17		1
1:45-2:00						32		
<b>HOURLY TOTAL</b>					<b>4</b>	<b>HOURLY TOTAL</b>		<b>93</b>
					<b>TOTAL</b>	<b>28</b>		
						<b>TOTAL</b>	<b>754</b>	

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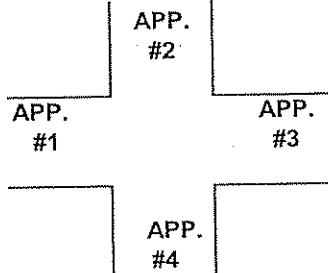
COUNT LOCATION:

CSAH 78 (Hanson Blvd.) @  
CSAH 116 (Bunker Lk. Blvd.)

DATE:

07/22/2004

APP. #1 = CSAH 116
APP. #2 = CSAH 78
APP. #3 = CSAH 116
APP. #4 = CSAH 78



HEAVY VEHICLE- ANY VEHICLE HAVING MORE THAN FOUR TIRES TOUCHING THE PAVEMENT  
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TIME	PEDESTRIANS					HEAVY VEHICLES		
	APP. #1	APP. #2	APP. #3	APP. #4	15 MIN TOT	TRUCKS	RV	BUS
2:00-2:15PM						21	1	1
2:15-2:30				2	2	20	1	2
2:30-2:45				1	1	24		7
2:45-3:00	2	1			3	22		1
<b>HOURLY TOTAL</b>					<b>6</b>	<b>HOURLY TOTAL</b>		<b>100</b>
3:00-3:15		1			1	20		4
3:15-3:30	1	1	1	1	4	19		1
3:30-3:45						17		6
3:45-4:00						24		2
<b>HOURLY TOTAL</b>					<b>5</b>	<b>HOURLY TOTAL</b>		<b>93</b>
4:00-4:15	1				1	18		1
4:15-4:30	2			2	4	22		2
4:30-4:45						17		
4:45-5:00		2	4	4	10	21		2
<b>HOURLY TOTAL</b>					<b>15</b>	<b>HOURLY TOTAL</b>		<b>83</b>
5:00-5:15		2			2	12		
5:15-5:30		1			1	12		
5:30-5:45				2	1	9		
5:45-6:00	1	1		1	3	12		
<b>HOURLY TOTAL</b>					<b>7</b>	<b>HOURLY TOTAL</b>		<b>45</b>
6:00-6:15				1	1	10		
6:15-6:30		1			1			
6:30-6:45		2	1	1	4	6		
6:45-7:00		1		1	2	8	3	
<b>HOURLY TOTAL</b>					<b>12</b>	<b>HOURLY TOTAL</b>		<b>27</b>
7:00-7:15				2	2	6		
7:15-7:30						4	2	
7:30-7:45	2	2	1	1	6	3		
7:45-8:00						4		
<b>HOURLY TOTAL</b>					<b>8</b>	<b>HOURLY TOTAL</b>		<b>19</b>
8:00-8:15	2	2	1	1	6	2	1	
8:15-8:30			1	1	1	5		
8:30-8:45	2	1	2	2	7	4		
8:45-9:00						2		
<b>HOURLY TOTAL</b>					<b>14</b>	<b>HOURLY TOTAL</b>		<b>14</b>
9:00-9:15		1			1	5		
9:15-9:30				1	1	5		
9:30-9:45	1	1		1	3			
9:45-10:00						3		
<b>HOURLY TOTAL</b>					<b>5</b>	<b>HOURLY TOTAL</b>		<b>13</b>
<b>TOTAL</b>					<b>72</b>	<b>TOTAL</b>		<b>813</b>

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