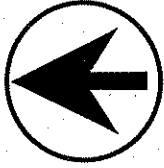


Date : 10/17/01

Count Number : TMC0135

Location : CSAH 23 (Lake Dr.)

@ CSAH 12 (Apollo Dr.)



North

CSAH 23

7754

#2

3961			
	D	E	T
	717	3244	0

3793

2195

#1

4536

2341	A	B	C
	1669	0	672

CSAH 12 (Apollo Dr.)

Lake Dr.

4599	M	L	K
	1478	3121	0

4913

#3

9512

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

Anoka County Highway Department

Traffic Volume and Turning

Movement Study

Anoka County Highway Department
Traffic Engineering

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

Traffic Volume and Turning Movement Study

File Name : TMC0135
Site Code : 01350201
Start Date : 10/17/2001
Page No : 1

Groups Printed- Unshifted

Start Time	CSAH 23 Southbound					Westbound					CSAH 23 Northbound					Apollo Dr. 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			
	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				
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				
06:00	0	122	27	9	149	0	0	0	0	0	19	16	0	1	35	0	0	28	4	28	14	212	226
06:15	0	113	15	4	128	0	0	0	0	0	31	21	0	4	52	2	0	25	7	27	15	207	222
06:30	0	109	15	3	124	0	0	0	0	0	49	18	0	0	67	7	0	17	1	24	4	215	219
06:45	0	104	20	4	124	0	0	0	0	0	54	32	0	7	86	2	0	24	3	26	14	236	250
Total	0	448	77	20	525	0	0	0	0	0	153	87	0	12	240	11	0	94	15	105	47	870	917
07:00	0	123	21	6	144	0	0	0	0	0	41	23	0	4	64	15	0	34	9	49	19	257	276
07:15	0	114	19	5	133	0	0	0	0	0	41	32	0	3	73	6	0	32	3	38	11	244	255
07:30	0	115	22	10	137	0	0	0	0	0	41	29	0	3	70	8	0	32	4	40	17	247	264
07:45	0	117	24	11	141	0	0	0	0	0	44	28	0	3	72	5	0	24	8	29	22	242	264
Total	0	469	86	32	555	0	0	0	0	0	167	112	0	13	279	34	0	122	24	156	69	990	1059
08:00	0	62	17	2	79	0	0	0	0	0	47	30	0	7	77	9	0	32	13	41	22	197	219
08:15	0	68	13	5	81	0	0	0	0	0	31	33	0	8	64	5	0	38	11	43	24	188	212
08:30	0	61	16	11	77	0	0	0	0	0	29	22	0	4	51	3	0	36	9	39	24	167	191
08:45	0	91	18	4	109	0	0	0	0	0	28	33	0	7	61	16	0	15	2	31	13	201	214
Total	0	282	64	22	346	0	0	0	0	0	135	118	0	26	253	33	0	121	35	154	83	753	836
09:00	0	60	13	9	73	0	0	0	0	0	28	25	0	10	53	6	0	29	7	35	26	161	187
09:15	0	57	11	2	68	0	0	0	0	0	27	30	0	6	57	6	0	27	7	33	15	158	173
09:30	0	43	18	8	61	0	0	0	0	0	24	24	0	7	48	7	0	22	5	29	20	138	158
09:45	0	64	12	8	76	0	0	0	0	0	16	27	0	7	43	13	0	27	10	40	25	159	184
Total	0	224	54	27	278	0	0	0	0	0	95	106	0	30	201	32	0	105	29	137	86	616	702
10:00	0	47	12	8	59	0	0	0	0	0	23	31	0	11	54	10	0	19	7	29	26	142	168
10:15	0	47	7	5	54	0	0	0	0	0	22	37	0	8	59	13	0	26	9	39	22	152	174
10:30	0	52	12	7	64	0	0	0	0	0	19	49	0	6	68	10	0	25	8	35	21	167	188
10:45	0	32	9	6	41	0	0	0	0	0	24	46	0	10	70	9	0	28	6	37	22	148	170
Total	0	178	40	26	218	0	0	0	0	0	88	163	0	35	251	42	0	98	30	140	91	609	700
11:00	0	43	9	4	52	0	0	0	0	0	20	32	0	9	52	14	0	27	3	41	16	145	161
11:15	0	45	13	9	58	0	0	0	0	0	19	34	0	8	53	16	0	35	5	51	22	162	184
11:30	0	41	13	8	54	0	0	0	0	0	22	30	0	2	52	7	0	32	6	39	16	145	161
11:45	0	43	15	7	58	0	0	0	0	0	22	54	0	10	76	9	0	50	11	59	28	193	221
Total	0	172	50	28	222	0	0	0	0	0	83	150	0	29	233	46	0	144	25	190	82	645	727
12:00	0	51	12	3	63	0	0	0	0	0	27	49	0	12	76	15	0	28	3	43	18	182	200
12:15	0	29	14	2	43	0	0	0	0	0	31	55	0	10	86	11	0	26	4	37	16	166	182
12:30	0	65	15	6	80	0	0	0	0	0	29	65	0	5	94	12	0	23	8	35	19	209	228
12:45	0	37	15	3	52	0	0	0	0	0	38	50	0	9	88	12	0	28	3	40	15	180	195
Total	0	182	56	14	238	0	0	0	0	0	125	219	0	36	344	50	0	105	18	155	68	737	805
13:00	0	40	12	4	52	0	0	0	0	0	20	49	0	5	69	7	0	30	2	37	11	158	169
13:15	0	47	7	8	54	0	0	0	0	0	24	42	0	8	66	16	0	17	4	33	20	153	173
13:30	0	53	10	7	63	0	0	0	0	0	24	51	0	13	75	12	0	24	8	36	28	174	202
13:45	0	55	9	5	64	0	0	0	0	0	33	63	0	9	96	18	0	28	8	46	22	206	228
Total	0	195	38	24	233	0	0	0	0	0	101	205	0	35	306	53	0	99	22	152	81	691	772
14:00	0	53	9	5	62	0	0	0	0	0	29	53	0	11	82	12	0	29	6	41	22	185	207
14:15	0	51	13	3	64	0	0	0	0	0	36	76	0	15	112	9	0	33	7	42	25	218	243
14:30	0	45	10	3	55	0	0	0	0	0	27	77	0	9	104	11	0	34	8	45	20	204	224
14:45	0	35	21	6	56	0	0	0	0	0	47	70	0	9	117	17	0	17	2	34	17	207	224
Total	0	184	53	17	237	0	0	0	0	0	139	276	0	44	415	49	0	113	23	162	84	814	898
15:00	0	52	18	3	70	0	0	0	0	0	25	77	0	7	102	14	0	57	5	71	15	243	258
15:15	0	54	14	8	68	0	0	0	0	0	34	98	0	6	132	28	0	58	2	86	16	286	302
15:30	0	67	10	6	77	0	0	0	0	0	37	90	0	9	127	27	0	61	4	88	19	292	311
15:45	0	46	11	4	57	0	0	0	0	0	33	99	0	4	132	30	0	48	2	78	10	267	277
Total	0	219	53	21	272	0	0	0	0	0	129	364	0	26	493	99	0	224	13	323	60	1088	1148
16:00	0	38	10	3	48	0	0	0	0	0	18	123	0	4	141	32	0	67	5	99	12	288	300
16:15	0	51	14	4	65	0	0	0	0	0	27	110	0	5	137	20	0	43	5	63	14	265	279
16:30	0	39	9	2	48	0	0	0	0	0	30	125	0	10	155	22	0	63	1	85	13	288	301
16:45	0	53	14	3	67	0	0	0	0	0	33	146	0	8	179	24	0	40	4	64	15	310	325
Total	0	181	47	12	228	0	0	0	0	0	108	504	0	27	612	98	0	213	15	311	54	1151	1205

or Street Approaches:

Northbound:

CSAH 23

Data File: C:\Program Files\PC-Warrants\TMC0135.war
 Count Type: IMC. Channel: 0. Count Date: 10/17/ 1
 Number of Lanes: 1
 Approach Speed: 50
 Total Approach Traffic: 4599

Southbound:

CSAH 23

Data File: C:\Program Files\PC-Warrants\TMC0135.war
 Count Type: IMC. Channel: 0. Count Date: 10/17/ 1
 Number of Lanes: 2
 Approach Speed: 50
 Total Approach Traffic: 3961

Minor Street Approaches:

Eastbound:

Apollo Dr.

Data File: C:\Program Files\PC-Warrants\TMC0135.war
 Count Type: IMC. Channel: 0. Count Date: 10/17/ 1
 Number of Lanes: 2
 Approach Speed: 45
 Total Approach Traffic: 2341

Westbound:

Data File: C:\Program Files\PC-Warrants\TMC0135.war
 Count Type: IMC. Channel: 0. Count Date: 10/17/ 1
 Number of Lanes: 1
 Approach Speed: 0
 Total Approach Traffic: 0

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	E	14		140		70		112
1	0	0	E	15		140		70		112
2	0	0	E	16		140		70		112
3	0	0	E	17		140		70		112
4	0	0	E	18		140		70		112
5	0	0	E	19		140		70		112
6	765	105	E	13	MAIN	140	--BOTH--	70	MAIN	112
7	834	156	E	6	--BOTH--	140	--BOTH--	70	--BOTH--	112
8	599	154	E	8	--BOTH--	140	SIDE	70	--BOTH--	112
9	479	137	E	11	MAIN	140	SIDE	70	SIDE	112
10	469	140	E	10	--BOTH--	140	SIDE	70	SIDE	112
11	455	190	E	4	--BOTH--	140	SIDE	70	SIDE	112
12	582	155	E	7	--BOTH--	140	SIDE	70	--BOTH--	112
13	539	152	E	9	--BOTH--	140	SIDE	70	--BOTH--	112
14	652	162	E	5	--BOTH--	140	--BOTH--	70	--BOTH--	112
15	765	323	E	1	--BOTH--	140	--BOTH--	70	--BOTH--	112
16	840	311	E	2	--BOTH--	140	--BOTH--	70	--BOTH--	112
17	956	236	E	3	--BOTH--	140	--BOTH--	70	--BOTH--	112
18	625	120	E	12	MAIN	140	SIDE	70	--BOTH--	112
19	0	0	E	20		140		70		112
20	0	0	E	21		140		70		112
21	0	0	E	22		140		70		112
22	0	0	E	23		140		70		112
23	0	0	E	24		140		70		112

Warrant Summary:

Rural values apply.

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

Warrant 1 - Minimum Vehicular Volumes

SATISFIED for 10 hours. Criteria--Main St.: 420; Side St.: See Volume Summary.

Warrant 2 - Interruption of Continuous Traffic

NOT SATISFIED. Required values reached for 6 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

NOT SATISFIED. At least one street has no major approaches. Peak hour total entering volume: 1192.

NS - Approaches which are part of the principal through traffic roadway network.

- Approaches which connect areas of principal traffic generation.

- 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 9 hours. Criteria--Main: 504; Side: See Volume Summary.

Warrant 9 - Four Hour Volumes

SATISFIED for 5 hours.

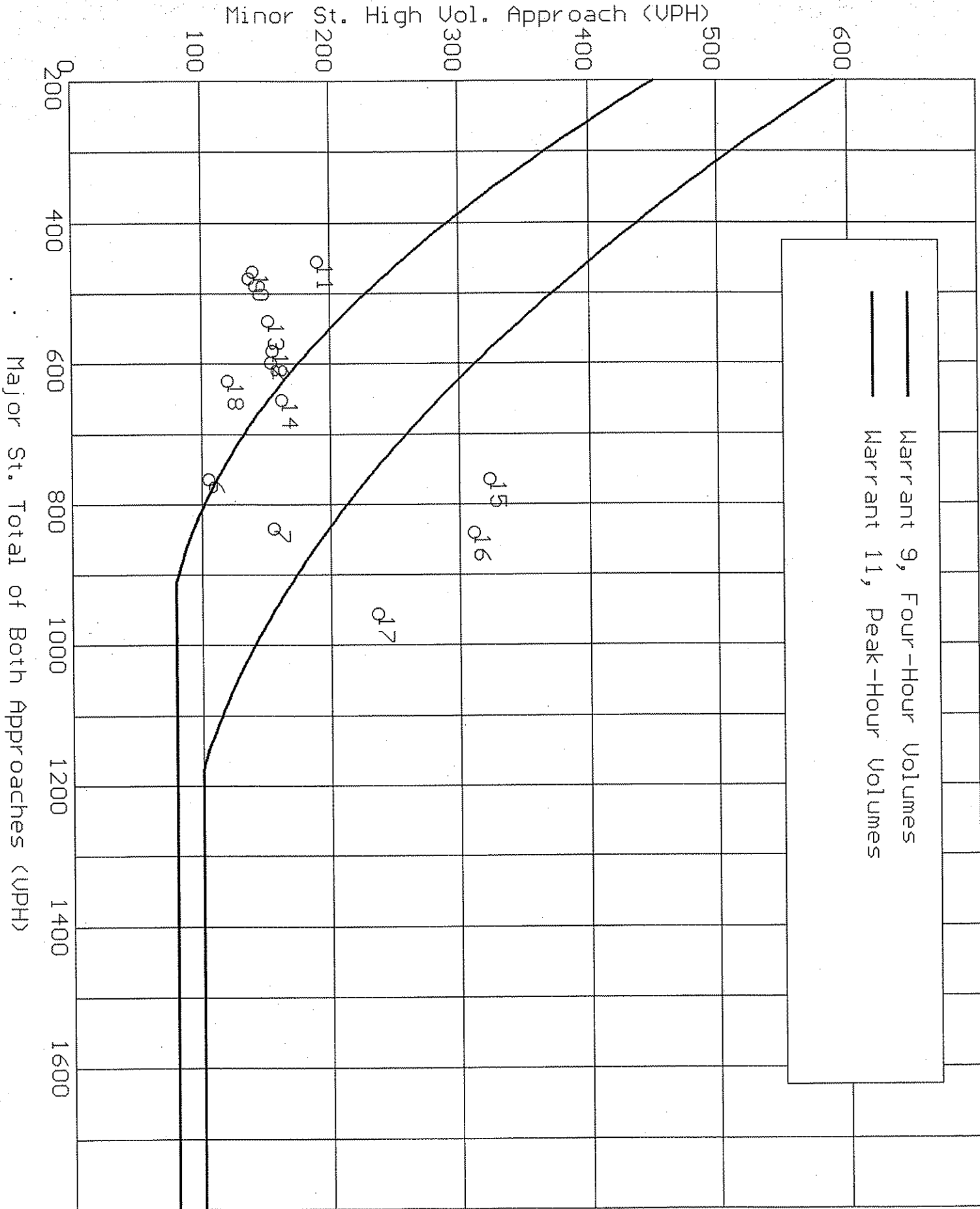
Warrant 10 - Peak Hour Delay

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 3 hours.



Multiway Stop Warrant Analysis
TMC 0135 CSAH 23 (Lake Dr.) @ CSAH 12 (Apollo Dr.)
Speed Limit of Major Roadway..... 50

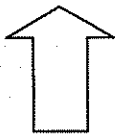
Minimum Traffic Volumes Multiway Stop Warrant Criteria:

- 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	870	105	0	105	0
7 AM - 8 AM	990	156	0	156	1
8 AM - 9 AM	753	154	0	154	1
9 AM - 10 AM	616	137	0	137	0
10 AM - 11 AM	609	140	0	140	1
11 AM - 12 PM	645	190	0	190	1
12 PM - 13 PM	737	155	0	155	1
1 PM - 2 PM	691	152	0	152	1
2 PM - 3 PM	814	162	0	162	1
3 PM - 4 PM	1088	323	0	323	1
4 PM - 5 PM	1151	311	0	311	1
5 PM - 6 PM	1192	236	0	236	1
6 PM - 7 PM	745	120	0	120	0

TOTAL HOURS MET: 10

MULTIWAY STOP WARRANT IS MET



NORTH

COUNT LOCATION:

CSAH 23 (Lake Dr.) @

DATE:

10/17/01

CSAH 12 (Apollo Dr.)

APP. #1= EB Apollo Dr.

APP. #2 =SB CSAH 23

APP. #3= NB CSAH 23

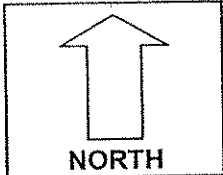
APP.
#2

APP.
#1

APP.
#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
6:00-6:15AM						13		1
6:15-6:30						14		1
6:30-6:45						4		
6:45-7:00						13		2
HOURLY TOTAL						HOURLY TOTAL		48
7:00-7:15						20		
7:15-7:30						11		
7:30-7:45						20		
7:45-8:00						17		2
HOURLY TOTAL						HOURLY TOTAL		70
8:00-8:15						21		1
8:15-8:30						23		
8:30-8:45						24		1
8:45-9:00						13		
HOURLY TOTAL						HOURLY TOTAL		83
9:00-9:15						26		
9:15-9:30						16		
9:30-9:45	1				1	20		
9:45-10:00						24		
HOURLY TOTAL					1	HOURLY TOTAL		86
10:00-10:15						26		
10:15-10:30						21	1	
10:30-10:45						21		
10:45-11:00						22		
HOURLY TOTAL						HOURLY TOTAL		91
11:00-11:15						16		
11:15-11:30	2				2	22		
11:30-11:45						15		
11:45-12:00						28		
HOURLY TOTAL					2	HOURLY TOTAL		81
12:00-12:15		1			1	18		
12:15-12:30						16		
12:30-12:45						19		
12:45-1:00						15		
HOURLY TOTAL					1	HOURLY TOTAL		68
1:00-1:15						11		
1:15-1:30						18		
1:30-1:45						30		
1:45-2:00						22		
HOURLY TOTAL						HOURLY TOTAL		81



COUNT LOCATION:

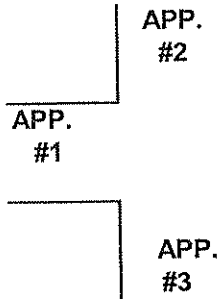
CSAH 23 (Lake Dr.) @

DATE:

10/18/01

CSAH 12 (Apollo Dr.)

APP. #1= EB Apollo Dr.
APP. #2 =SB CSAH 23
APP. #3= NB CSAH 23



- 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.
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 - 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						22		
2:15-2:30						25		
2:30-2:45						20		
2:45-3:00						17		
HOURLY TOTAL						HOURLY TOTAL		84
3:00-3:15						16		
3:15-3:30						16		
3:30-3:45						19		
3:45-4:00						10		
HOURLY TOTAL						HOURLY TOTAL		61
4:00-4:15						12		
4:15-4:30						14		
4:30-4:45	3				3	13		
4:45-5:00						15		
HOURLY TOTAL					3	HOURLY TOTAL		54
5:00-5:15						5		
5:15-5:30						7	1	1
5:30-5:45						4	1	
5:45-6:00	1				1	5		
HOURLY TOTAL					1	HOURLY TOTAL		24
6:00-6:15	1				1	4		1
6:15-6:30						8		
6:30-6:45						1		
6:45-7:00						4		
HOURLY TOTAL					1	HOURLY TOTAL		18