

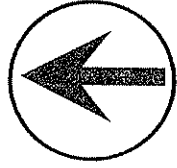
Date : 08/23/10

Count Number : TMC1035

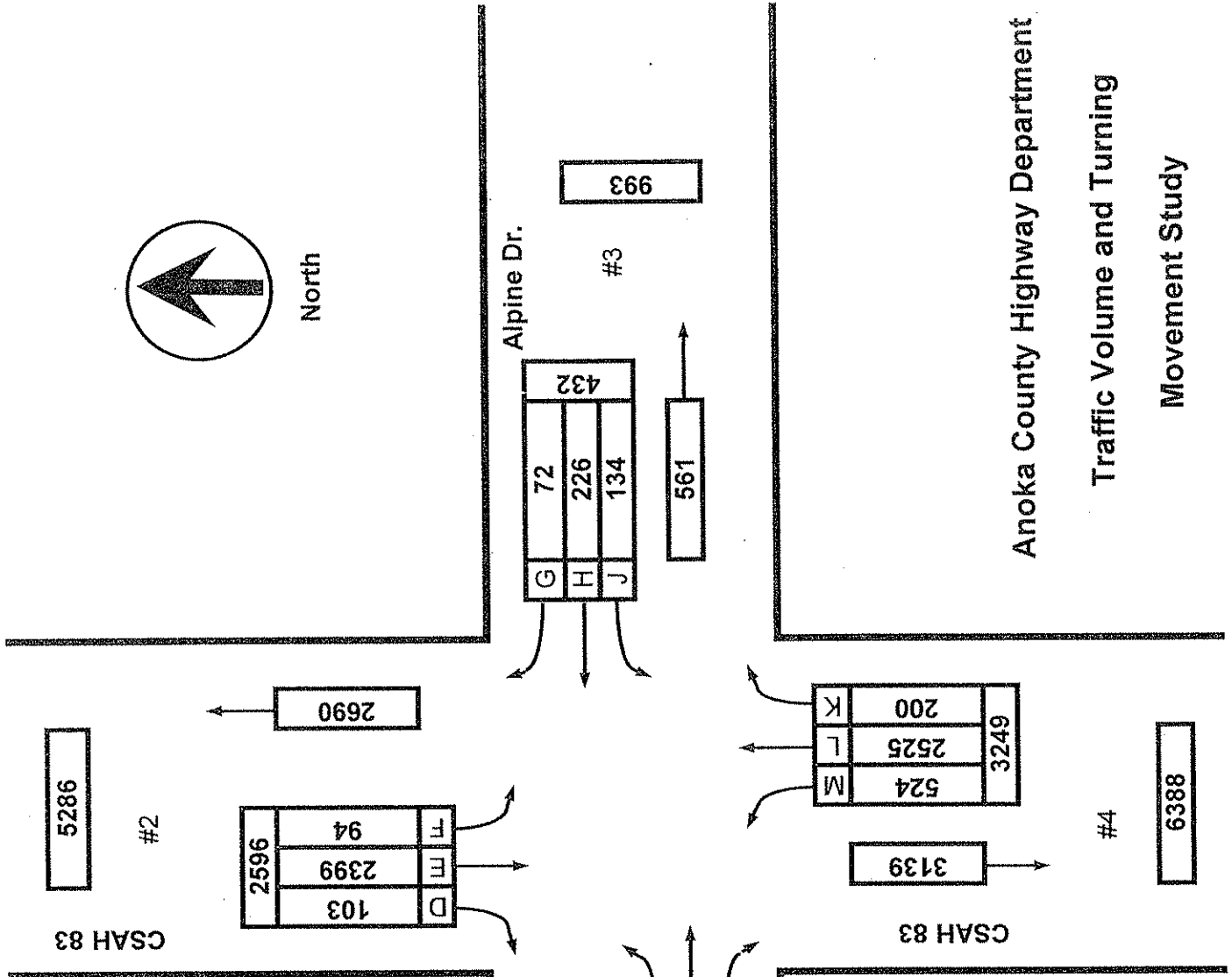
Location : CSAH 83 (Armstrong Blvd.)

@ Alpine Dr.

Collection Period : 6:00AM - 10:00PM



North



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

Anoka County Highway Department  
 Traffic Volume and Turning  
 Movement Study

Date : 08/24/10

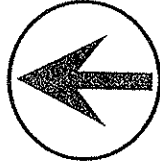
Count Number : TMC1035

Location : CSAH 83 (Armstrong Blvd.)

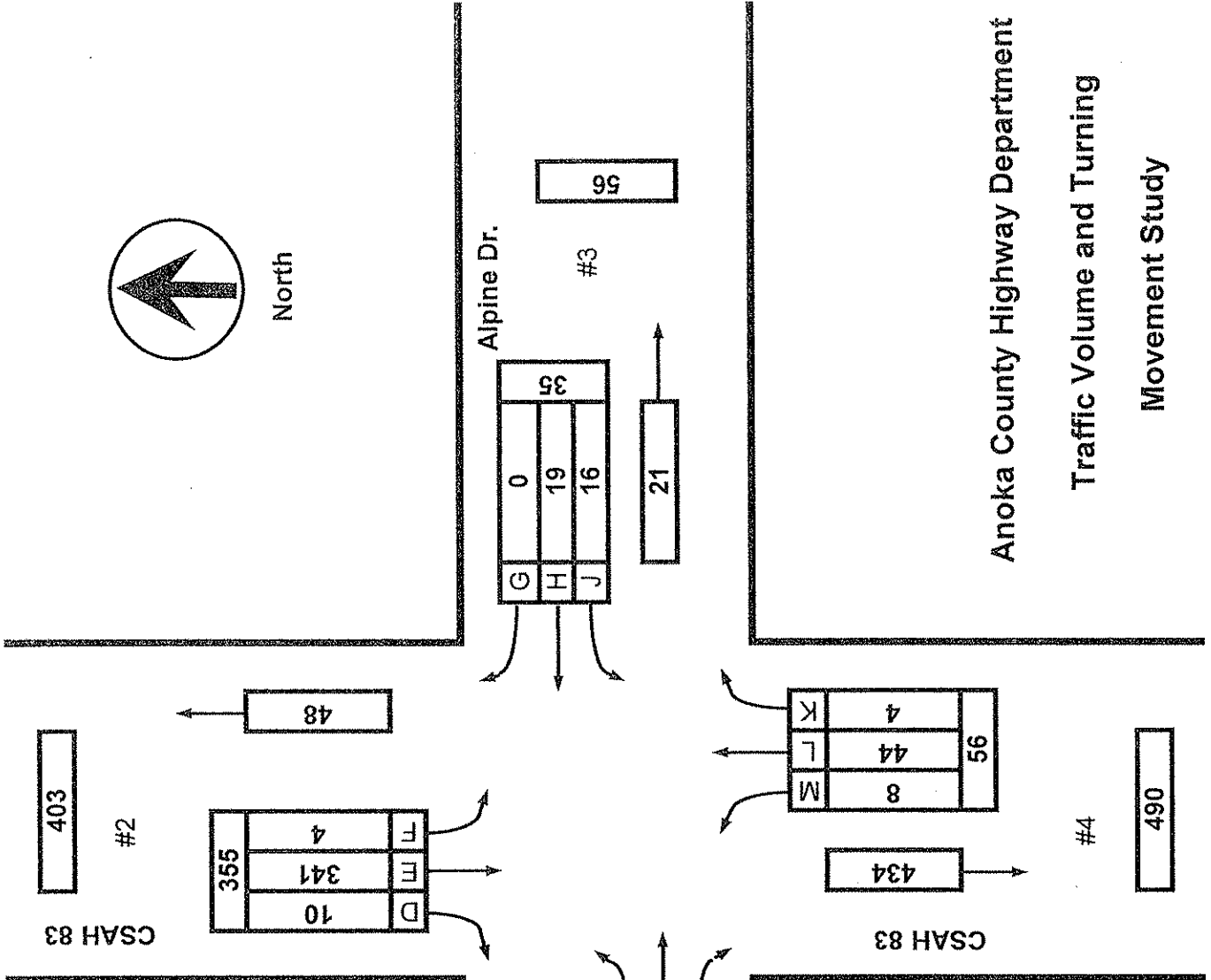
@ Alpine Dr.

Collection Period : AM PEAK

Hour : 6:45-7:45 AM



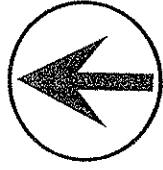
North



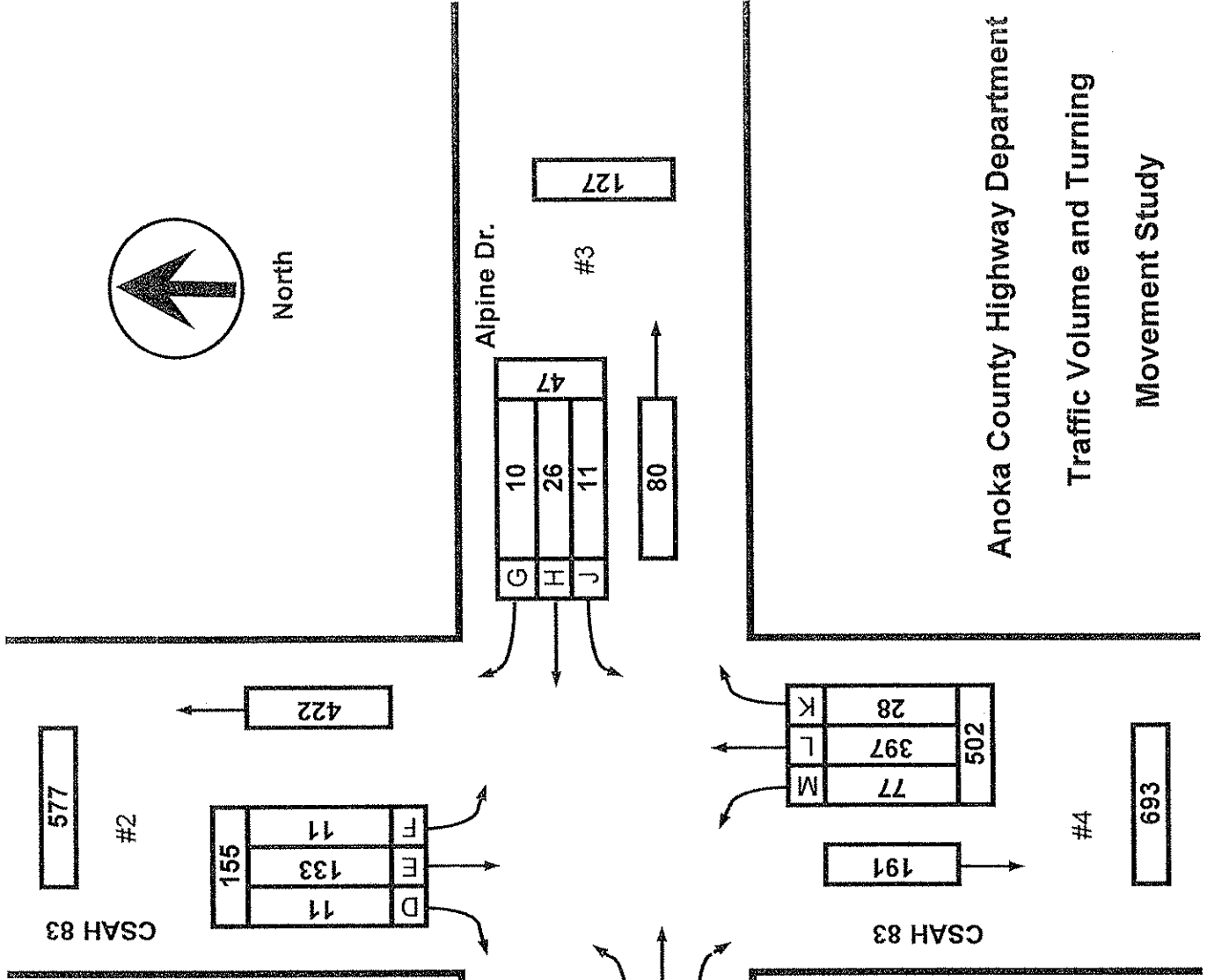
	EXISTING LANES OF APPROACH			TOTAL
	RIGHT TURN LANE	LEFT TURN LANE	THRU LANES	
#1	0	0	1	1
#2	1	0	1	2
#3	0	0	1	1
#4	1	0	1	2

Anoka County Highway Department  
 Traffic Volume and Turning  
 Movement Study

Date : 08/23/10 \_\_\_\_\_  
 Count Number : TMC1035 \_\_\_\_\_  
 Location : CSAH 83 (Armstrong Blvd.) \_\_\_\_\_  
 @ Alpine Dr. \_\_\_\_\_  
 Collection Period : PM PEAK \_\_\_\_\_  
 Hour : 4:30-5:30 PM \_\_\_\_\_



North



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

Anoka County Highway Department  
 Traffic Volume and Turning  
 Movement Study





# Anoka County Highway Department

## Traffic Engineering Section Traffic Volume and Turning Movement Study

Weather: Warm and Sunny  
Counter: DB-400  
Counted by: Andy/Brett

File Name : TMC1035  
Site Code : 10350202  
Start Date : 08/23/2010  
Page No : 2

Groups Printed- Unshifted

Start Time	CSAH 83 Southbound					Alpine Dr. Westbound					CSAH 83 Northbound					Alpine Dr. Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Heavys	App. Total	Left	Thru	Right	Heavys	App. Total	Left	Thru	Right	Heavys	App. Total	Left	Thru	Right	Heavys	App. Total			
18:00	1	22	2	0	25	2	5	1	0	8	13	76	3	0	92	2	7	6	1	15	1	140	141
18:15	3	33	3	2	39	3	7	4	1	14	14	77	7	0	98	3	5	8	0	16	3	167	170
18:30	3	39	1	0	43	3	3	1	0	7	12	45	6	1	63	3	5	3	0	11	1	124	125
18:45	2	32	1	0	35	3	4	2	0	9	8	49	9	1	66	0	2	12	0	14	1	124	125
Total	9	126	7	2	142	11	19	8	1	38	47	247	25	2	319	8	19	29	1	56	6	555	561
19:00	0	28	0	0	28	5	6	2	0	13	3	53	0	1	56	1	2	6	0	9	1	106	107
19:15	3	24	2	0	29	3	4	2	0	9	12	30	4	2	46	1	3	8	0	12	2	96	98
19:30	6	23	2	0	31	1	7	2	0	10	12	46	1	2	59	0	6	7	3	13	5	113	118
19:45	2	23	2	0	27	3	5	2	0	10	9	49	7	1	65	2	1	14	1	17	2	119	121
Total	11	98	6	0	115	12	22	8	0	42	36	178	12	6	226	4	12	35	4	51	10	434	444
20:00	0	45	0	0	45	0	4	0	0	4	6	44	4	2	54	1	6	14	0	21	2	124	126
20:15	3	39	1	1	43	1	2	1	0	4	7	54	4	0	65	1	10	7	0	18	1	130	131
20:30	2	26	1	1	29	1	3	2	0	6	12	34	0	0	46	1	5	5	0	11	1	92	93
20:45	3	18	0	0	21	1	1	2	0	4	9	47	2	1	58	0	3	6	0	9	1	92	93
Total	8	128	2	2	138	3	10	5	0	18	34	179	10	3	223	3	24	32	0	59	5	438	443
21:00	4	16	1	0	21	1	1	1	0	3	10	32	3	0	45	1	4	7	0	12	0	81	81
21:15	2	17	3	0	22	1	2	1	0	4	9	31	2	0	42	1	2	2	0	5	0	73	73
21:30	1	12	2	0	15	2	2	3	0	7	8	36	3	0	47	0	2	3	0	5	0	74	74
21:45	1	13	2	0	16	2	4	2	0	8	8	24	2	0	34	0	2	3	0	5	0	63	63
Total	8	58	8	0	74	6	9	7	0	22	35	123	10	0	168	2	10	15	0	27	0	291	291
Grand Total	94	2399	103	97	2596	134	226	72	14	432	524	2525	200	111	3249	93	267	606	32	966	254	7243	7497
Approach %	3.6	92.4	4			31	52.3	16.7			16.1	77.7	6.2			9.6	27.6	62.7			3.4	96.6	
Total %	1.3	33.1	1.4		35.8	1.9	3.1	1			7.2	34.9	2.8		44.9	1.3	3.7	8.4		13.3			

Start Time	CSAH 83 Southbound				Alpine Dr. Westbound				CSAH 83 Northbound				Alpine Dr. Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 to 11:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 06:45																	
06:45	1	80	3	84	3	4	0	7	1	6	1	8	1	4	24	29	128
07:00	1	73	3	77	3	3	0	6	1	13	2	16	1	6	16	23	122
07:15	1	99	1	101	5	7	0	12	2	14	0	16	2	2	14	18	147
07:30	1	89	3	93	5	5	0	10	4	11	1	16	0	1	23	24	143
Total Volume	4	341	10	355	16	19	0	35	8	44	4	56	4	13	77	94	540
% App. Total	1.1	96.1	2.8		45.7	54.3	0		14.3	78.6	7.1		4.3	13.8	81.9		
PHF	1.000	.861	.833	.879	.800	.679	.000	.729	.500	.786	.500	.875	.500	.542	.802	.810	.918

Start Time	CSAH 83 Southbound				Alpine Dr. Westbound				CSAH 83 Northbound				Alpine Dr. Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 12:00 to 21:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	1	31	1	33	5	3	2	10	16	87	6	109	4	15	11	30	182
16:45	4	32	2	38	5	7	3	15	19	100	9	128	2	12	9	23	204
17:00	4	38	5	47	1	10	3	14	23	96	7	126	3	8	13	24	211
17:15	2	32	3	37	0	6	2	8	19	114	6	139	6	6	14	26	210
Total Volume	11	133	11	155	11	26	10	47	77	397	28	502	15	41	47	103	807
% App. Total	7.1	85.8	7.1		23.4	55.3	21.3		15.3	79.1	5.6		14.6	39.8	45.6		
PHF	.688	.875	.550	.824	.550	.650	.833	.783	.837	.871	.778	.903	.625	.683	.839	.858	.956

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

Study Name : TMC1035  
Study Date : 08/31/10  
Page No. : 1

**Signal Warrants - Summary**

**Major Street Approaches**

**Northbound: CSAH 83**  
Number of Lanes: 2  
Approach Speed: 55  
Total Approach Volume: 3,249

**Southbound: CSAH 83**  
Number of Lanes: 2  
Approach Speed: 55  
Total Approach Volume: 2,596

**Minor Street Approaches**

**Eastbound: Alpine Dr.**  
Number of Lanes: 1  
  
Total Approach Volume: 966

**Westbound: Alpine Dr.**  
Number of Lanes: 1  
  
Total Approach Volume: 432

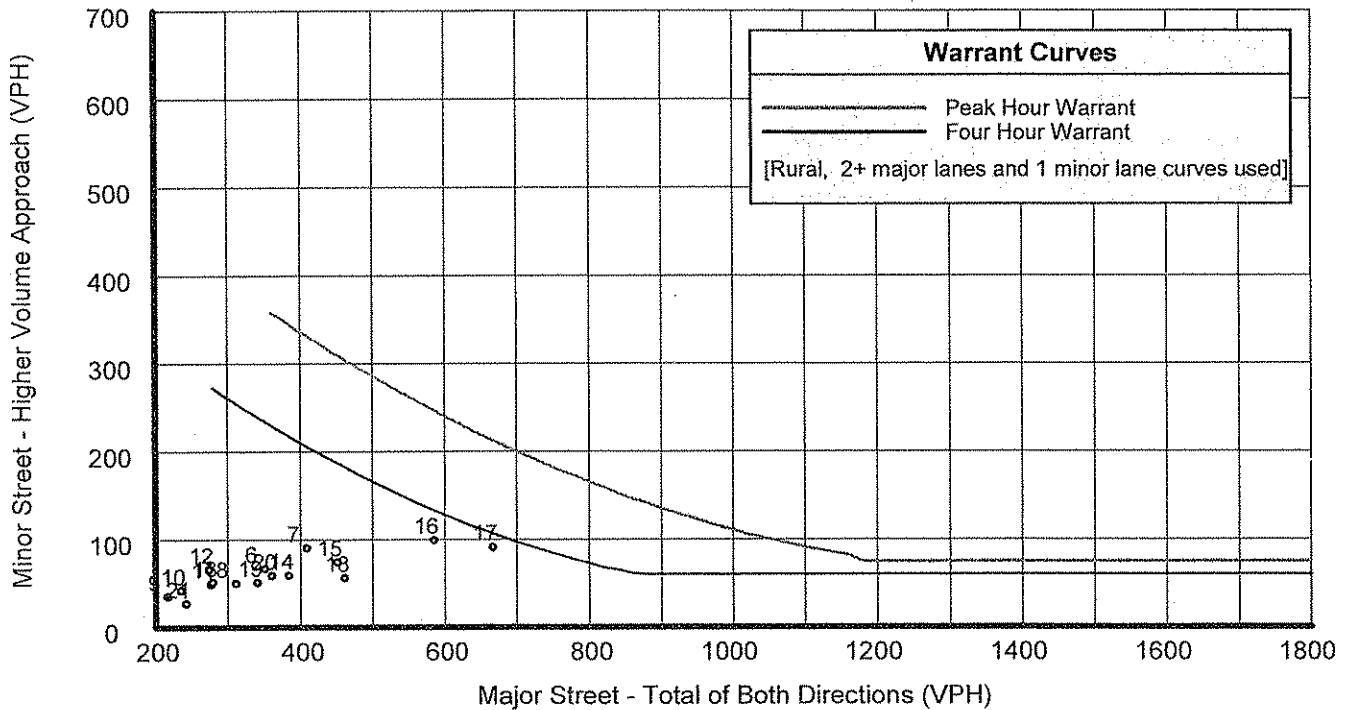
**Warrant Summary (Rural values apply.)**

<b>Warrant 1 - Eight Hour Vehicular Volumes</b> .....	<b>Not Satisfied</b>
<b>Warrant 1A - Minimum Vehicular Volume</b> .....	<b>Not Satisfied</b>
Required volumes reached for 0 hours, 8 are needed	
<b>Warrant 1B - Interruption of Continuous Traffic</b> .....	<b>Not Satisfied</b>
Required volumes reached for 1 hours, 8 are needed	
<b>Warrant 1 A&amp;B - Combination of Warrants</b> .....	<b>Not Satisfied</b>
Required volumes reached for 2 hours, 8 are needed	
<b>Warrant 2 - Four Hour Volumes</b> .....	<b>Not Satisfied</b>
Number of hours (0) volumes exceed minimum < minimum required (4).	
<b>Warrant 3 - Peak Hour</b> .....	<b>Satisfied</b>
<b>Warrant 3A - Peak Hour Delay</b> .....	<b>Satisfied</b>
Number of hours (1) volumes exceed minimum >= required (1). Delay data not evaluated.	
<b>Warrant 3B - Peak Hour Volumes</b> .....	<b>Not Satisfied</b>
Volumes do not exceed minimums for any hour.	
<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 : TMC1035  
Study Date : 08/31/10  
Page No. : 2

**Signal Warrants - Summary**



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

Hour Begin	Major Total	Higher Minor		War-1A			War-1B			War-1A&B		
		Vol	Dir	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?
00:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
01:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
02:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
03:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
04:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
05:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
06:00	351	67	EB	420-No	105-No	---	630-No	53-Yes	Minor	504-No	84-No	---
07:00	409	90	EB	420-No	105-No	---	630-No	53-Yes	Minor	504-No	84-Yes	Minor
08:00	311	50	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
09:00	217	35	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
10:00	235	42	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
11:00	277	49	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
12:00	274	66	EB	420-No	105-No	---	630-No	53-Yes	Minor	504-No	84-No	---
13:00	279	51	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
14:00	384	59	EB	420-No	105-No	---	630-No	53-Yes	Minor	504-No	84-No	---
15:00	451	74	EB	420-Yes	105-No	Major	630-No	53-Yes	Minor	504-No	84-No	---
16:00	585	99	EB	420-Yes	105-No	Major	630-No	53-Yes	Minor	504-Yes	84-Yes	Both
17:00	667	91	EB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-Yes	Both
18:00	461	56	EB	420-Yes	105-No	Major	630-No	53-Yes	Minor	504-No	84-No	---
19:00	341	51	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
20:00	361	59	EB	420-No	105-No	---	630-No	53-Yes	Minor	504-No	84-No	---
21:00	242	27	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
22:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
23:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---

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

Study Name : TMC1035  
Study Date : 08/31/10  
Page No. : 1

**Multi-Way Stop Warrant Report**

**Major Street Approaches**

**Northbound: CSAH 83**  
Total Approach Volume: 3,249  
Approach Speed: 55

**Southbound: CSAH 83**  
Total Approach Volume: 2,596  
Approach Speed: 55

**Minor Street Approaches**

**Eastbound: Alpine Dr.**  
Total Approach Volume: 966

**Westbound: Alpine Dr.**  
Total Approach Volume: 432

**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

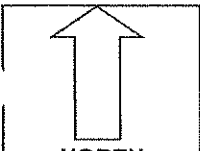
**Criteria C - Minimum Volumes and Delays** ..... Not Satisfied  
Delay data not evaluated  
Required volumes reached for 1 hours, 8 are needed

**Criteria D - 80% of Volumes, Delays, and Crashes** ..... Not Evaluated  
Delay data not evaluated  
Number of crashes (-1) is less than the minimum required (4).  
Required volumes reached for 0 hours, 8 are needed

**Analysis of 8 Hour Volume Warrants:**

Time	Major Total	Minor Total	Crit C			Crit D		
			Major	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?
16:15 - 17:15	618	141	210-Yes	140-Yes	Both	240-Yes	160-No	Major
05:45 - 06:45	259	57	210-Yes	140-No	Major	240-Yes	160-No	Major
06:00 - 07:00	351	93	210-Yes	140-No	Major	240-Yes	160-No	Major
06:15 - 07:15	380	110	210-Yes	140-No	Major	240-Yes	160-No	Major
06:30 - 07:30	416	119	210-Yes	140-No	Major	240-Yes	160-No	Major
06:45 - 07:45	411	129	210-Yes	140-No	Major	240-Yes	160-No	Major
07:00 - 08:00	409	127	210-Yes	140-No	Major	240-Yes	160-No	Major
07:15 - 08:15	403	120	210-Yes	140-No	Major	240-Yes	160-No	Major
07:30 - 08:30	363	101	210-Yes	140-No	Major	240-Yes	160-No	Major
07:45 - 08:45	330	86	210-Yes	140-No	Major	240-Yes	160-No	Major
08:00 - 09:00	311	69	210-Yes	140-No	Major	240-Yes	160-No	Major
08:15 - 09:15	264	60	210-Yes	140-No	Major	240-Yes	160-No	Major
08:30 - 09:30	245	56	210-Yes	140-No	Major	240-Yes	160-No	Major
08:45 - 09:45	239	53	210-Yes	140-No	Major	240-No	160-No	No
09:00 - 10:00	217	53	210-Yes	140-No	Major	240-No	160-No	No
09:15 - 10:15	232	59	210-Yes	140-No	Major	240-No	160-No	No
09:30 - 10:30	234	68	210-Yes	140-No	Major	240-No	160-No	No
09:45 - 10:45	219	66	210-Yes	140-No	Major	240-No	160-No	No
10:00 - 11:00	235	67	210-Yes	140-No	Major	240-No	160-No	No
10:15 - 11:15	253	63	210-Yes	140-No	Major	240-Yes	160-No	Major
10:30 - 11:30	255	63	210-Yes	140-No	Major	240-Yes	160-No	Major
10:45 - 11:45	262	68	210-Yes	140-No	Major	240-Yes	160-No	Major
11:00 - 12:00	277	69	210-Yes	140-No	Major	240-Yes	160-No	Major
11:15 - 12:15	276	84	210-Yes	140-No	Major	240-Yes	160-No	Major

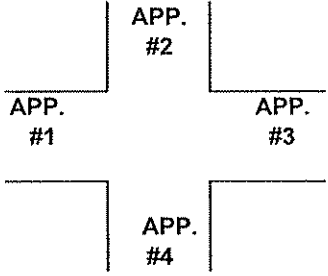




**NORTH**

APP. #1 = Alpine Dr.
APP. #2 = CSAH 83
APP. #3 = Alpine Dr.
APP. #4 = CSAH 83

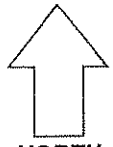
**COUNT LOCATION:** CSAH 83 (Armstrong Blvd.) **DATE:** 08/24/2010  
@ CSAH 20 (161st Ave.)



**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						2		
6:30-6:45						2		
6:45-7:00						1		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>8</b>
7:00-7:15						2		
7:15-7:30						6		
7:30-7:45						5		
7:45-8:00						5		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>18</b>
8:00-8:15						9	1	
8:15-8:30								
8:30-8:45						3		
8:45-9:00						3		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>16</b>
9:00-9:15						3		
9:15-9:30						4		
9:30-9:45						7		
9:45-10:00						4		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>18</b>
10:00-10:15						4		
10:15-10:30						7		
10:30-10:45						5		
10:45-11:00						11		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>27</b>
11:00-11:15						10		
11:15-11:30						5		
11:30-11:45						2		
11:45-12:00						4		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>21</b>
12:00-12:15						8		
12:15-12:30						4		
12:30-12:45						4		
12:45-1:00						7		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>23</b>
1:00-1:15						2		
1:15-1:30						3		
1:30-1:45						5		
1:45-2:00						8		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>18</b>
<b>TOTAL</b>						<b>TOTAL</b>		<b>149</b>

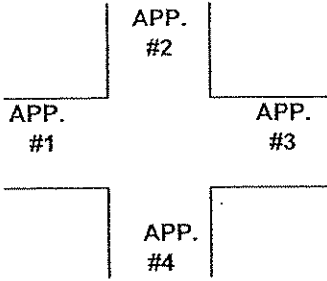
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NORTH

APP. #1 = Alpine Dr.
APP. #2 = CSAH 83
APP. #3 = Alpine Dr.
APP. #4 = CSAH 83

COUNT LOCATION: CSAH 83 (Armstrong Blvd.) DATE: 08/23/2010  
@ CSAH 20 (161st Ave.)



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						9		1
2:15-2:30						8		
2:30-2:45						6		
2:45-3:00						7		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>31</b>
3:00-3:15						5		
3:15-3:30						6		
3:30-3:45						5		1
3:45-4:00						5		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>22</b>
4:00-4:15						4		
4:15-4:30						7		
4:30-4:45						4		
4:45-5:00						3		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>18</b>
5:00-5:15						5		
5:15-5:30						4		
5:30-5:45						1		
5:45-6:00						2		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>12</b>
6:00-6:15						1		
6:15-6:30						3		
6:30-6:45							1	
6:45-7:00						1		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>6</b>
7:00-7:15						1		
7:15-7:30						2		
7:30-7:45						5		
7:45-8:00						2		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>10</b>
8:00-8:15						2		
8:15-8:30						1		
8:30-8:45						1		
8:45-9:00						1		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>5</b>
9:00-9:15								
9:15-9:30								
9:30-9:45								
9:45-10:00								
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		
					<b>TOTAL</b>		<b>TOTAL</b>	<b>253</b>

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