

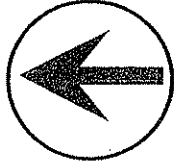
Date : 08/16/10

Count Number : TMC1032

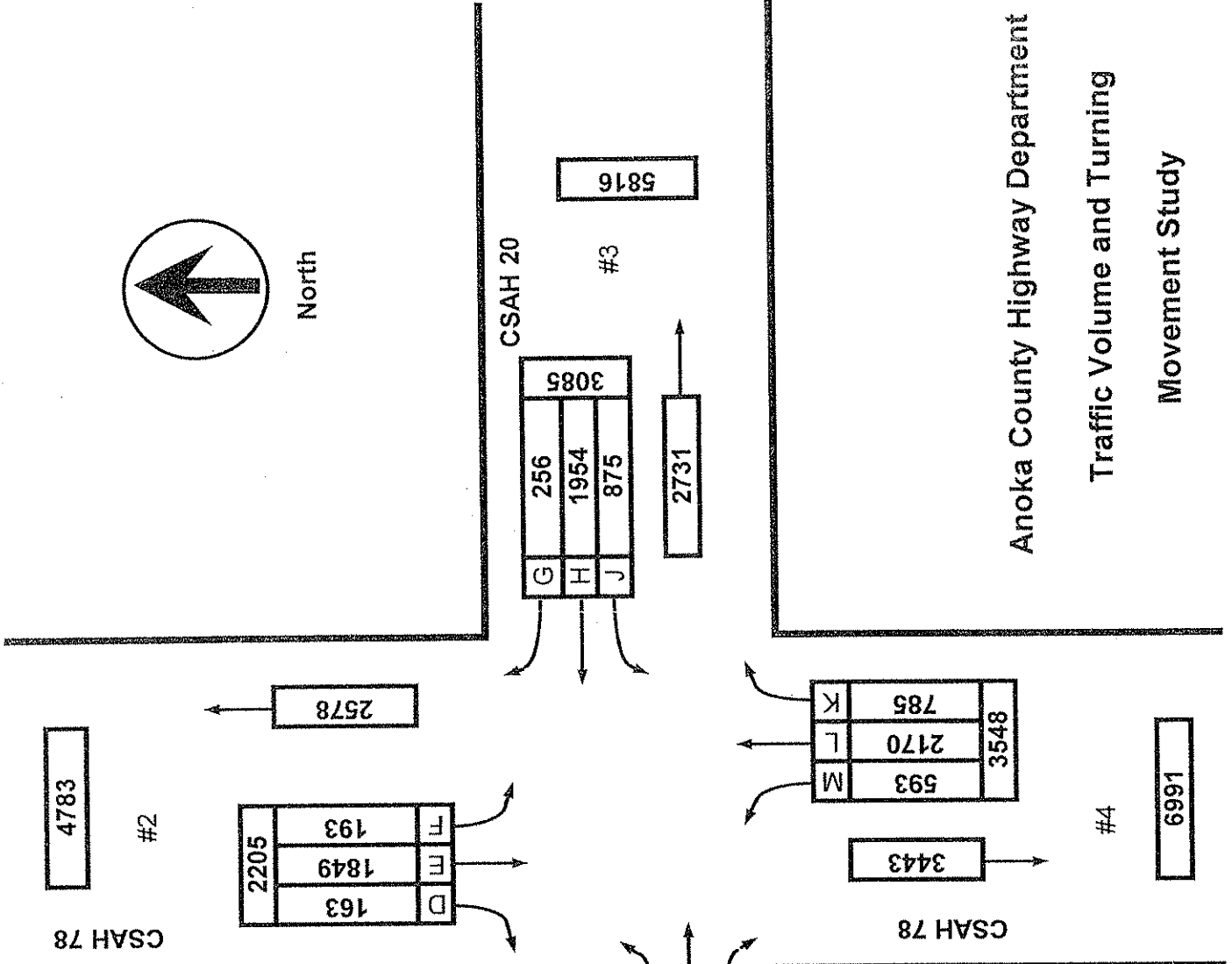
Location : CSAH 78 (Hanson Blvd.)

@ CSAH 20 (161st Ave.)

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



North



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

Anoka County Highway Department  
 Traffic Volume and Turning  
 Movement Study

Date : 08/17/10

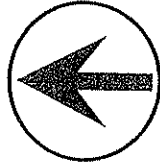
Count Number : TMC1032

Location : CSAH 78 (Hanson Blvd.)

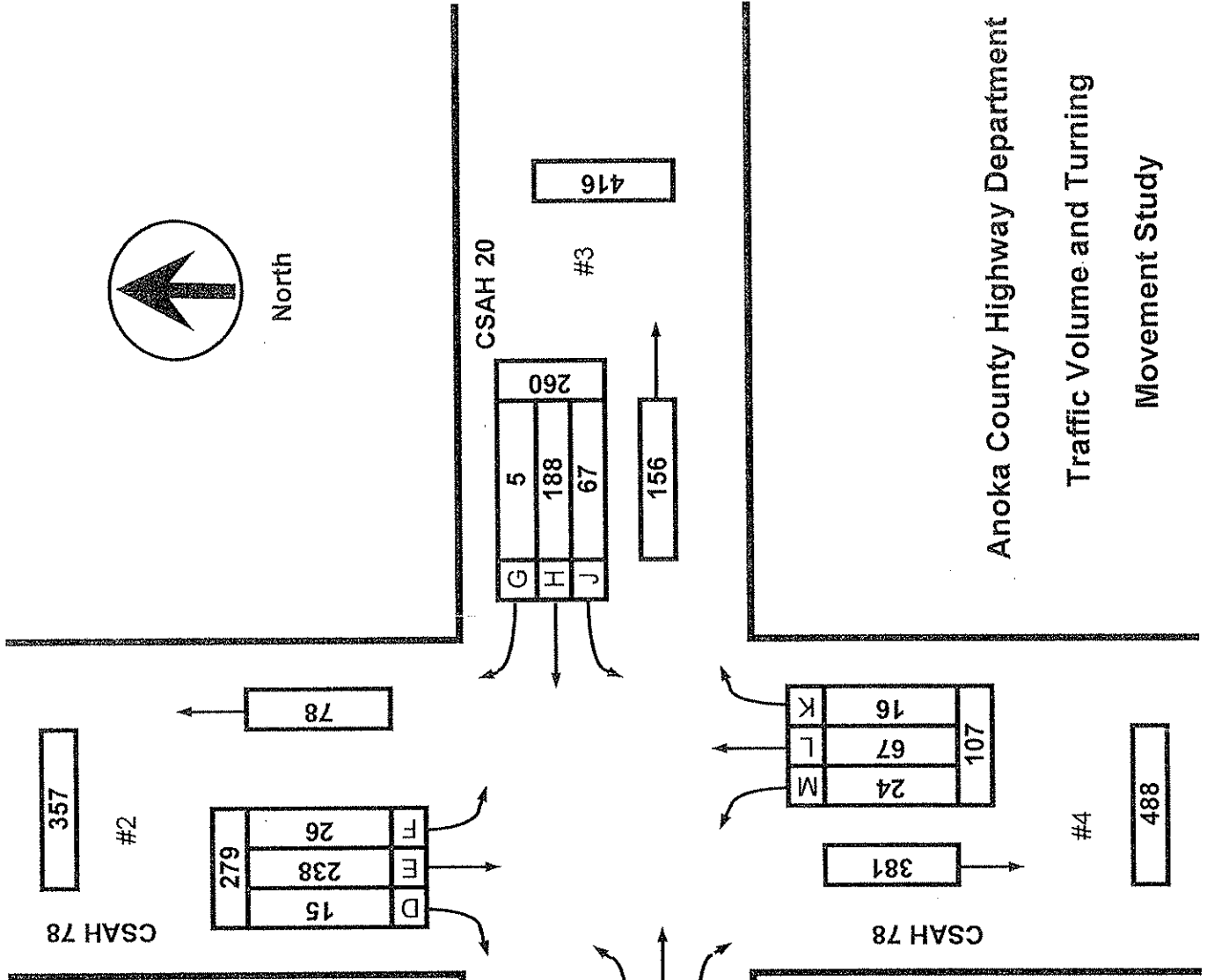
@ CSAH 20 (161st Ave.)

Collection Period : AM PEAK

Hour : 7:00-8:00 AM



North



Anoka County Highway Department  
Traffic Volume and Turning  
Movement Study

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

Date : 08/16/10

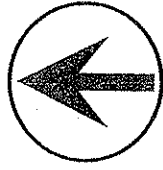
Count Number : TMC1032

Location : CSAH 78 (Hanson Blvd.)

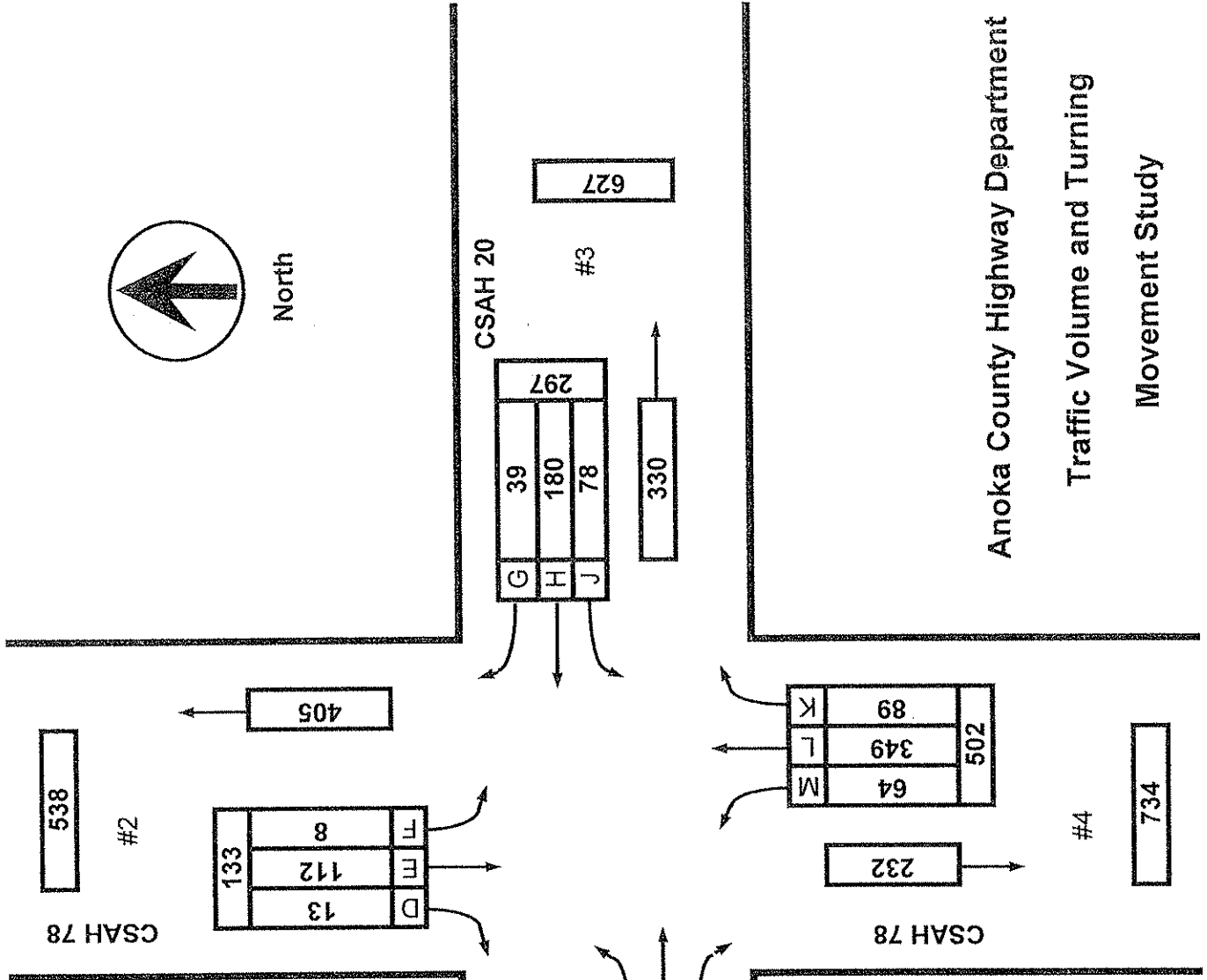
@ CSAH 20 (161st Ave.)

Collection Period : PM PEAK

Hour : 4:30-5:30 PM



North



Anoka County Highway Department  
Traffic Volume and Turning  
Movement Study

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





# 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 : TMC1032  
 Site Code : 10320202  
 Start Date : 08/16/2010  
 Page No : 2

Groups Printed- Unshifted

Start Time	CSAH 78 Southbound					CSAH 20 Westbound					CSAH 78 Northbound					CSAH 20 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	2	18	3	3	23	16	39	8	1	63	6	52	25	3	83	5	37	16	1	58	8	227	235
18:15	6	25	1	0	32	16	42	9	1	67	12	52	21	0	85	1	44	12	1	57	2	241	243
18:30	6	21	1	1	28	6	30	3	0	39	8	47	15	1	70	3	32	14	0	49	2	186	188
18:45	4	23	1	1	28	17	32	2	0	51	8	32	11	1	51	2	22	14	2	38	4	168	172
Total	18	87	6	5	111	55	143	22	2	220	34	183	72	5	289	11	135	56	4	202	16	822	838
19:00	5	22	5	0	32	18	32	5	1	55	13	22	17	0	52	2	29	12	1	43	2	182	184
19:15	5	21	0	0	26	16	10	4	0	30	8	41	9	0	58	4	24	10	0	38	0	152	152
19:30	2	26	2	0	30	11	18	2	0	31	12	28	15	0	55	3	25	9	0	37	0	153	153
19:45	1	18	1	0	20	5	27	4	0	36	12	27	19	0	58	2	26	7	1	35	1	149	150
Total	13	87	8	0	108	50	87	15	1	152	45	118	60	0	223	11	104	38	2	153	3	636	639
20:00	2	14	0	0	16	14	37	7	0	58	17	22	22	0	61	3	18	5	0	26	0	161	161
20:15	2	17	3	0	22	8	21	5	0	34	19	49	20	0	88	2	19	8	0	29	0	173	173
20:30	0	27	0	0	27	12	29	5	0	46	11	31	17	0	59	3	33	16	0	52	0	184	184
20:45	1	20	2	0	23	6	30	2	0	38	9	34	14	2	57	1	20	5	0	26	2	144	146
Total	5	78	5	0	88	40	117	19	0	176	56	136	73	2	265	9	90	34	0	133	2	662	664
21:00	5	11	3	0	19	9	25	6	1	40	11	35	10	1	56	2	17	6	0	25	2	140	142
21:15	8	12	4	0	24	5	22	10	0	37	13	47	13	0	73	5	22	7	0	34	0	168	168
21:30	2	7	3	0	12	3	14	1	0	18	12	44	9	0	65	5	23	2	0	28	0	123	123
21:45	1	5	2	0	8	3	15	4	0	22	11	37	11	0	59	4	22	4	0	30	0	119	119
Total	16	35	12	0	63	20	76	21	1	117	47	163	43	1	253	14	84	19	0	117	2	550	552
Grand Total	193	1849	163	75	2205	875	1954	256	86	3085	593	2170	785	101	3548	152	1753	719	81	2624	343	11462	11805
North %	8.8	83.9	7.4			28.4	63.3	8.3			16.7	61.2	22.1			5.8	66.8	27.4					
Total %	1.7	16.1	1.4		19.2	7.6	17	2.2		26.9	5.2	18.9	6.8		31	1.3	15.3	6.3		22.9	2.9	97.1	

Start Time	CSAH 78 Southbound				CSAH 20 Westbound				CSAH 78 Northbound				CSAH 20 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 07:00																	
07:00	6	63	2	71	14	33	1	48	6	12	2	20	4	26	18	48	187
07:15	7	54	5	66	24	48	0	72	8	16	6	30	0	30	17	47	215
07:30	5	60	2	67	14	45	1	60	4	13	4	21	1	24	24	49	197
07:45	8	61	6	75	15	62	3	80	6	26	4	36	1	34	17	52	243
Total Volume	26	238	15	279	67	188	5	260	24	67	16	107	6	114	76	196	842
% App. Total	9.3	85.3	5.4		25.8	72.3	1.9		22.4	62.6	15		3.1	58.2	38.8		
PHF	.813	.944	.625	.930	.698	.758	.417	.813	.750	.644	.667	.743	.375	.838	.792	.942	.866

Peak Hour Analysis From 12:00 to 21:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	2	29	2	33	29	40	5	74	13	108	37	158	3	53	12	68	333
16:45	3	22	4	29	16	47	15	78	26	78	19	123	8	64	9	81	311
17:00	1	24	5	30	15	47	10	72	9	73	17	99	5	47	11	63	264
17:15	2	37	2	41	18	46	9	73	16	90	16	122	1	69	10	80	316
Total Volume	8	112	13	133	78	180	39	297	64	349	89	502	17	233	42	292	1224
% App. Total	6	84.2	9.8		26.3	60.6	13.1		12.7	69.5	17.7		5.8	79.8	14.4		
PHF	.667	.757	.650	.811	.672	.957	.650	.952	.615	.808	.601	.794	.531	.844	.875	.901	.919

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

Study Name : TMC1032  
Study Date : 08/23/10  
Page No. : 1

**Signal Warrants - Summary**

**Major Street Approaches**

**Northbound: CSAH 78**

Number of Lanes: 2  
Approach Speed: 55  
Total Approach Volume: 3,548

**Southbound: CSAH 78**

Number of Lanes: 2  
Approach Speed: 55  
Total Approach Volume: 2,205

**Minor Street Approaches**

**Eastbound: CSAH 20**

Number of Lanes: 2  
  
Total Approach Volume: 2,624

**Westbound: CSAH 20**

Number of Lanes: 2  
  
Total Approach Volume: 3,085

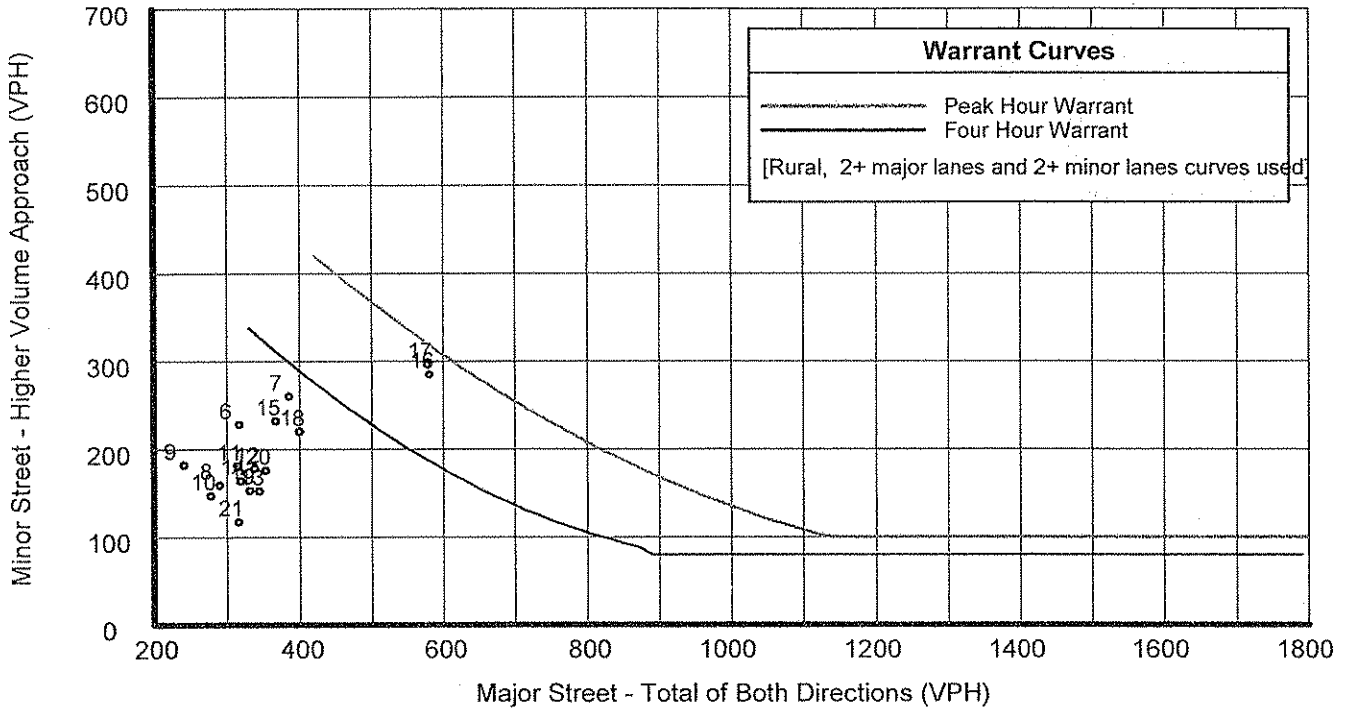
**Warrant Summary (Rural values apply.)**

<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 2 hours, 8 are needed	
<b>Warrant 1B - Interruption of Continuous Traffic</b> .....	<b>Not Satisfied</b>
Required volumes reached for 0 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 (2) 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 (16) volumes exceed minimum >= required (1). Delay data not evaluated.	
<b>Warrant 3B - Peak Hour Volumes</b> .....	<b>Satisfied</b>
Volumes exceed minimums for at least one 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 : TMC1032  
Study Date : 08/23/10  
Page No. : 2

**Signal Warrants - Summary**



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

Hour	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	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	317	228	WB	420-No	140-Yes	Minor	630-No	70-Yes	Minor	504-No	112-Yes	Minor
07:00	386	260	WB	420-No	140-Yes	Minor	630-No	70-Yes	Minor	504-No	112-Yes	Minor
08:00	290	159	EB	420-No	140-Yes	Minor	630-No	70-Yes	Minor	504-No	112-Yes	Minor
09:00	241	182	WB	420-No	140-Yes	Minor	630-No	70-Yes	Minor	504-No	112-Yes	Minor
10:00	278	147	WB	420-No	140-Yes	Minor	630-No	70-Yes	Minor	504-No	112-Yes	Minor
11:00	314	181	WB	420-No	140-Yes	Minor	630-No	70-Yes	Minor	504-No	112-Yes	Minor
12:00	338	178	WB	420-No	140-Yes	Minor	630-No	70-Yes	Minor	504-No	112-Yes	Minor
13:00	344	152	WB	420-No	140-Yes	Minor	630-No	70-Yes	Minor	504-No	112-Yes	Minor
14:00	319	164	EB	420-No	140-Yes	Minor	630-No	70-Yes	Minor	504-No	112-Yes	Minor
15:00	367	232	EB	420-No	140-Yes	Minor	630-No	70-Yes	Minor	504-No	112-Yes	Minor
16:00	581	285	WB	420-Yes	140-Yes	Both	630-No	70-Yes	Minor	504-Yes	112-Yes	Both
17:00	578	296	WB	420-Yes	140-Yes	Both	630-No	70-Yes	Minor	504-Yes	112-Yes	Both
18:00	400	220	WB	420-No	140-Yes	Minor	630-No	70-Yes	Minor	504-No	112-Yes	Minor
19:00	331	153	EB	420-No	140-Yes	Minor	630-No	70-Yes	Minor	504-No	112-Yes	Minor
20:00	353	176	WB	420-No	140-Yes	Minor	630-No	70-Yes	Minor	504-No	112-Yes	Minor
21:00	316	117	EB	420-No	140-No	---	630-No	70-Yes	Minor	504-No	112-Yes	Minor
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 : TMC1032  
Study Date : 08/23/10  
Page No. : 1

**Multi-Way Stop Warrant Report**

**Major Street Approaches**

**Northbound: CSAH 78**  
Total Approach Volume: 3,548  
Approach Speed: 55

**Southbound: CSAH 78**  
Total Approach Volume: 2,205  
Approach Speed: 55

**Minor Street Approaches**

**Eastbound: CSAH 20**  
Total Approach Volume: 2,624

**Westbound: CSAH 20**  
Total Approach Volume: 3,085

**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

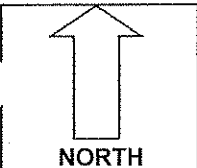
**Criteria C - Minimum Volumes and Delays** ..... Satisfied  
Delay data not evaluated  
Required volumes reached for 16 hours, 8 are needed

**Criteria D - 80% of Volumes, Delays, and Crashes** ..... Not Evaluated  
Delay data not evaluated  
Number of crashes (-1) is less than the minimum required (4).  
Required volumes reached for 8 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?
06:00 - 07:00	317	345	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
07:00 - 08:00	386	456	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
08:00 - 09:00	290	318	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
09:00 - 10:00	241	282	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
10:00 - 11:00	278	257	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
11:00 - 12:00	314	321	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
12:00 - 13:00	338	318	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
13:00 - 14:00	344	294	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
14:00 - 15:00	319	315	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
15:00 - 16:00	367	433	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
16:00 - 17:00	581	531	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
17:00 - 18:00	578	569	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
18:00 - 19:00	400	422	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
19:00 - 20:00	331	305	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
20:00 - 21:00	353	309	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
21:00 - 22:00	316	234	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
00:00 - 01:00	0	0	210-No	140-No	No	240-No	160-No	No
00:15 - 01:15	0	0	210-No	140-No	No	240-No	160-No	No
00:30 - 01:30	0	0	210-No	140-No	No	240-No	160-No	No
00:45 - 01:45	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
01:15 - 02:15	0	0	210-No	140-No	No	240-No	160-No	No
01:30 - 02:30	0	0	210-No	140-No	No	240-No	160-No	No
01:45 - 02:45	0	0	210-No	140-No	No	240-No	160-No	No





COUNT LOCATION:

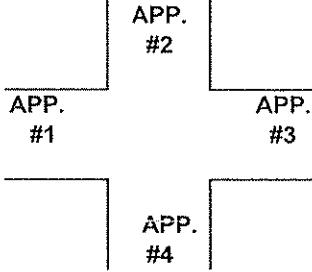
CSAH 78 (Hanson Blvd.)

DATE:

08/17/2010

@ CSAH 20 (161st Ave.)

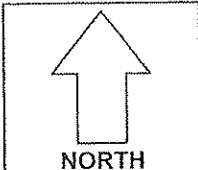
APP. #1 = CSAH 20
APP. #2 = CSAH 78
APP. #3 = CSAH 20
APP. #4 = CSAH 78



- 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						3		
6:15-6:30						3		
6:30-6:45						4		
6:45-7:00						7		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>17</b>
7:00-7:15						8		
7:15-7:30						7		
7:30-7:45						5		1
7:45-8:00						10		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>31</b>
8:00-8:15						10		
8:15-8:30						8		
8:30-8:45						4		
8:45-9:00						9		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>31</b>
9:00-9:15						9		
9:15-9:30						4		1
9:30-9:45						13		
9:45-10:00						16		1
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>44</b>
10:00-10:15						10		
10:15-10:30						9		
10:30-10:45						7		
10:45-11:00						10		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>36</b>
11:00-11:15						9		
11:15-11:30						6		
11:30-11:45						7		
11:45-12:00						7	1	
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>30</b>
12:00-12:15						11		
12:15-12:30						3		
12:30-12:45						7		
12:45-1:00						7		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>28</b>
1:00-1:15						7		1
1:15-1:30						7		
1:30-1:45						3		
1:45-2:00						4		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>22</b>
<b>TOTAL</b>						<b>TOTAL</b>		<b>239</b>

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32



COUNT LOCATION:

CSAH 78 (Hanson Blvd.)

DATE:

08/16/2010

@ CSAH 20 (161st Ave.)

APP. #1 = CSAH 20
APP. #2 = CSAH 78
APP. #3 = CSAH 20
APP. #4 = CSAH 78

APP. #2

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

APP. #1

APP. #3

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.

APP. #4

TIME	PEDESTRIANS					HEAVY VEHICLES		
	APP. #1	APP. #2	APP. #3	APP. #4	15 MIN TOT	TRUCKS	RV	BUS
2:00-2:15PM						5		
2:15-2:30						5	2	
2:30-2:45						7		
2:45-3:00						8		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>27</b>
3:00-3:15						11		
3:15-3:30						3		
3:30-3:45						5		
3:45-4:00						7		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>26</b>
4:00-4:15						3		
4:15-4:30						3		
4:30-4:45						3		
4:45-5:00						3		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>12</b>
5:00-5:15						8		
5:15-5:30						2		
5:30-5:45						2		
5:45-6:00						4	1	
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>17</b>
6:00-6:15						8		
6:15-6:30						2		
6:30-6:45						2		
6:45-7:00						4		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>16</b>
7:00-7:15						1		
7:15-7:30								
7:30-7:45								
7:45-8:00						1		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>2</b>
8:00-8:15								
8:15-8:30								
8:30-8:45								
8:45-9:00						2		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>2</b>
9:00-9:15						1	1	
9:15-9:30								
9:30-9:45								
9:45-10:00								
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>2</b>
					<b>TOTAL</b>		<b>TOTAL</b>	<b>343</b>

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