

Date : 09/11/13

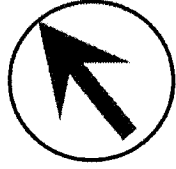
Count Number : TMC1340

Location : CSAH 23 (Lake Drive)

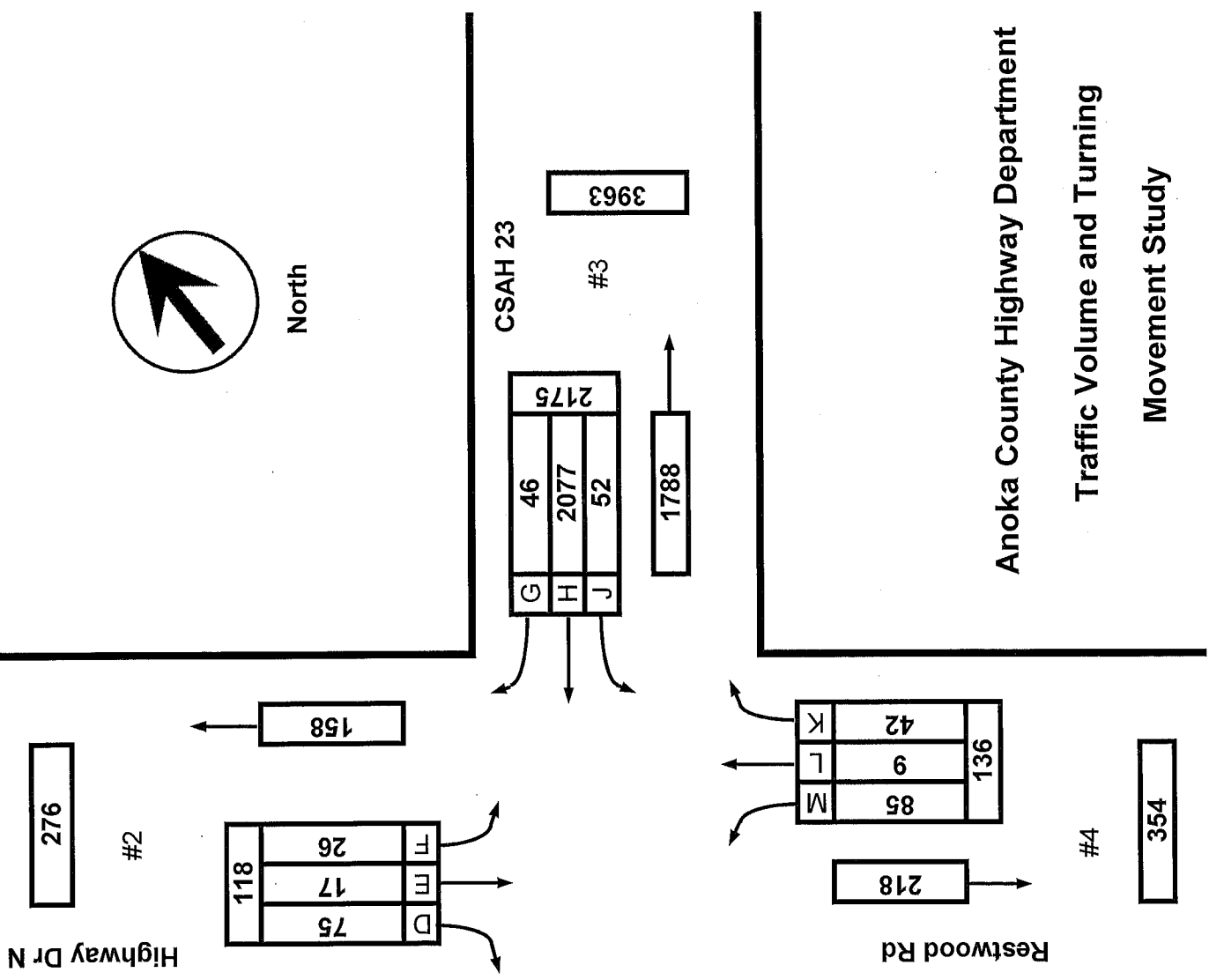
@ Restwood Rd./Highway Dr N

Collection Period : PEAK HOURS

6:30-8:30 AM, 4-6 PM



North



CSAH 23 #3

G	46	2175
H	2077	
J	52	
		1788

Highway Dr N #2

D	75	118
E	17	
F	26	
		158

Restwood Rd #4

M	85	136
L	9	
K	42	
		218

CSAH 23 #1

C	103	1972
B	1720	
A	149	
		2237

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

Anoka County Highway Department  
 Traffic Volume and Turning  
 Movement Study

Date : 09/11/13

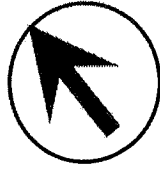
Count Number : TMC1340

Location : CSAH 23 (Lake Drive)

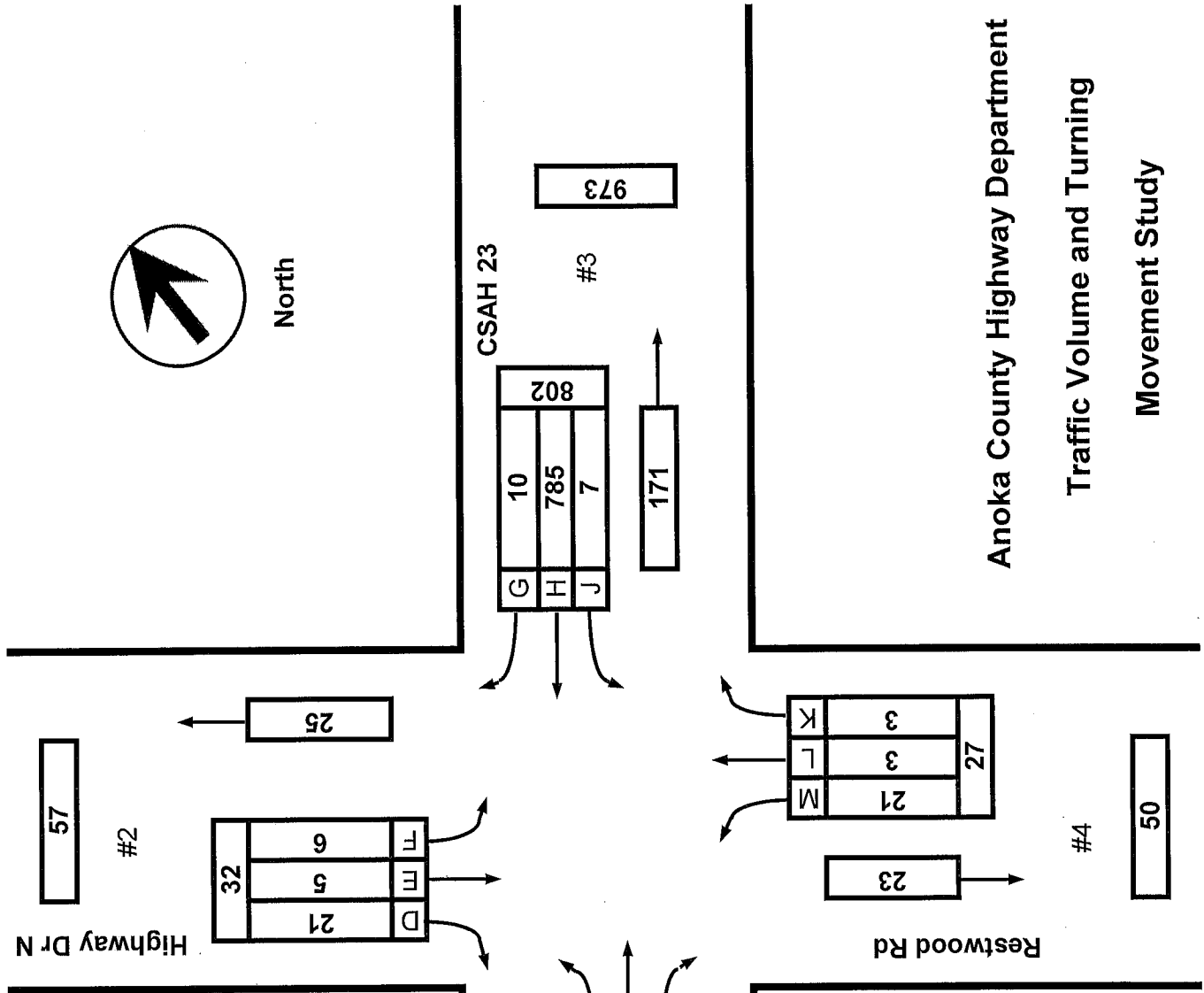
@ Restwood Rd./Highway Dr N

Collection Period : AM PEAK

Hour : 7:00 - 8:00 AM



North



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

Anoka County Highway Department  
 Traffic Volume and Turning  
 Movement Study

Date : 09/11/13

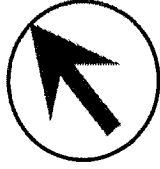
Count Number : TMC1340

Location : CSAH 23 (Lake Drive)

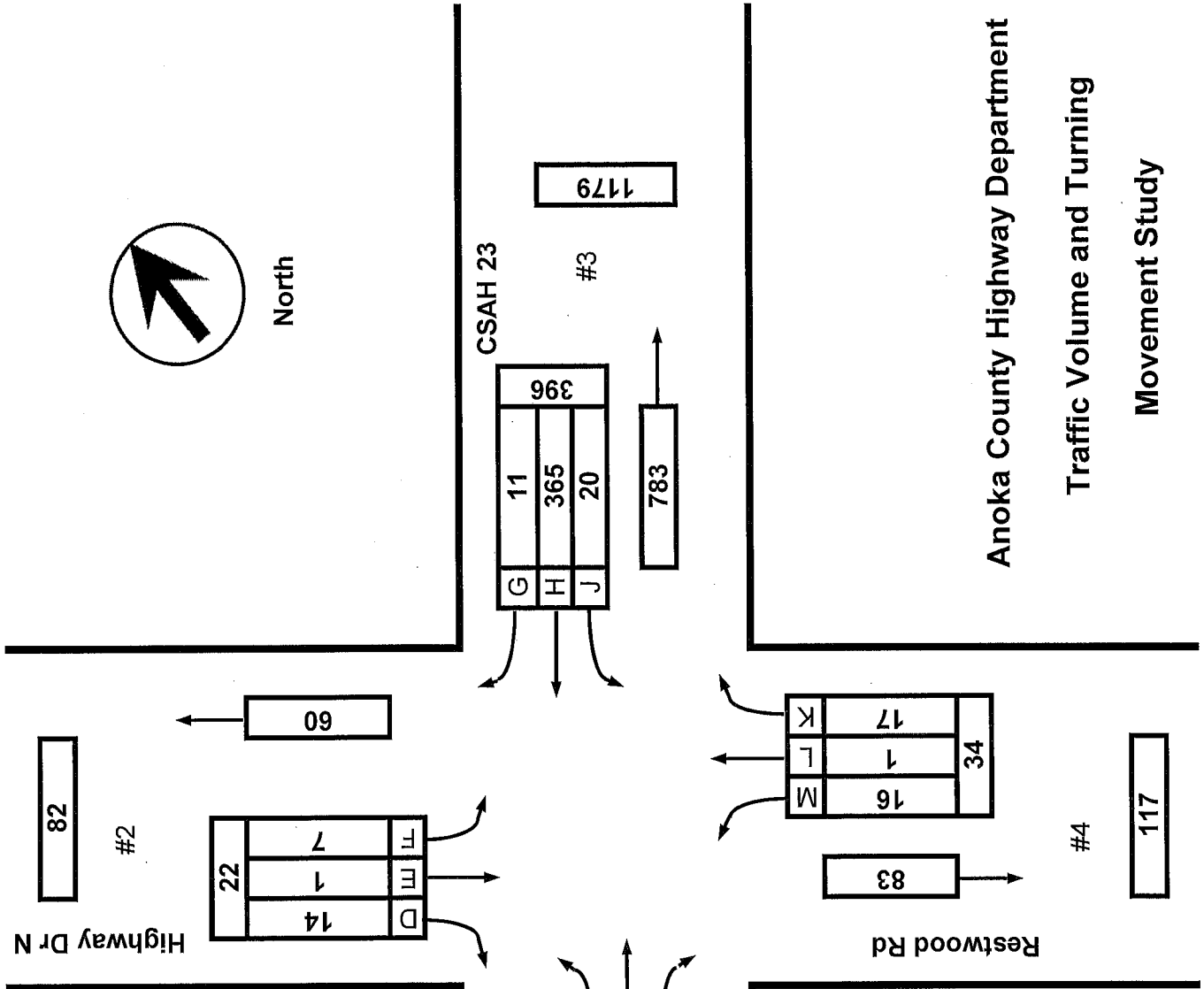
@ Restwood Rd./Highway Dr N

Collection Period : PM PEAK

Hour : 4:45 PM - 5:45 PM



North



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

Anoka County Highway Department  
 Traffic Volume and Turning  
 Movement Study



# Anoka County Highway Department

## Traffic Engineering Section

### Traffic Volume and Turning Movement Study

File Name : TMC 1340

Site Code : 13400202

Start Date : 09/04/2013

Page No : 1

Weather: Cloudy and Warm

Counter: DB-400

study conducted by: Josie/Terri

Groups Printed- Unshifted

Start Time	Highway Dr N Southbound					CSAH 23 Westbound					Restwood Rd Northbound					CSAH 23 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			
06:30	0	0	3	0	3	2	177	1	0	180	9	0	2	0	11	3	24	4	4	31	4	225	229
06:45	0	1	3	0	4	1	151	1	0	153	5	0	4	1	9	2	45	11	5	58	6	224	230
Total	0	1	6	0	7	3	328	2	0	333	14	0	6	1	20	5	69	15	9	89	10	449	459
07:00	1	0	4	0	5	3	195	1	3	199	6	0	0	2	6	3	33	2	4	38	9	248	257
07:15	0	1	7	1	8	0	191	5	1	196	4	3	0	0	7	5	32	2	0	39	2	250	252
07:30	2	2	6	2	10	2	220	3	5	225	4	0	2	0	6	1	49	5	1	55	8	296	304
07:45	3	2	4	0	9	2	179	1	1	182	7	0	1	1	8	3	48	2	6	53	8	252	260
Total	6	5	21	3	32	7	785	10	10	802	21	3	3	3	27	12	162	11	11	185	27	1046	1073
08:00	3	1	4	1	8	1	134	1	2	136	8	1	2	0	11	1	48	5	4	54	7	209	216
08:15	1	1	2	1	4	5	107	8	3	120	7	0	3	0	10	3	34	4	3	41	7	175	182
*** BREAK ***																							
Total	4	2	6	2	12	6	241	9	5	256	15	1	5	0	21	4	82	9	7	95	14	384	398
*** BREAK ***																							
16:00	3	3	8	2	14	6	90	4	6	100	4	3	5	2	12	8	170	14	2	192	12	318	330
16:15	2	0	7	0	9	1	81	5	4	87	2	0	3	0	5	6	160	8	4	174	8	275	283
16:30	1	3	10	0	14	4	99	3	5	106	5	0	2	0	7	9	160	15	3	184	8	311	319
16:45	1	0	3	1	4	5	80	3	2	88	3	0	9	0	12	12	210	16	4	238	7	342	349
Total	7	6	28	3	41	16	350	15	17	381	14	3	19	2	36	35	700	53	13	788	35	1246	1281
17:00	2	0	4	0	6	5	94	6	1	105	3	0	4	1	7	9	173	13	3	195	5	313	318
17:15	2	1	5	0	8	7	87	2	0	96	6	1	3	1	10	12	201	18	3	231	4	345	349
17:30	2	0	2	0	4	3	104	0	1	107	4	0	1	0	5	15	175	15	0	205	1	321	322
17:45	3	2	3	0	8	5	88	2	2	95	8	1	1	0	10	11	158	15	2	184	4	297	301
Total	9	3	14	0	26	20	373	10	4	403	21	2	9	2	32	47	707	61	8	815	14	1276	1290
Grand Total	26	17	75	8	118	52	2077	46	36	2175	85	9	42	8	136	103	1720	149	48	1972	100	4401	4501
Approch %	22	14.4	63.6			2.4	95.5	2.1			62.5	6.6	30.9			5.2	87.2	7.6					
Total %	0.6	0.4	1.7		2.7	1.2	47.2	1	49.4		1.9	0.2	1	3.1		2.3	39.1	3.4	44.8		2.2	97.8	

Start Time	Highway Dr N Southbound				CSAH 23 Westbound				Restwood Rd Northbound				CSAH 23 Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00	1	0	4	5	3	195	1	199	6	0	0	6	3	33	2	38	248
07:15	0	1	7	8	0	191	5	196	4	3	0	7	5	32	2	39	250
07:30	2	2	6	10	2	220	3	225	4	0	2	6	1	49	5	55	296
07:45	3	2	4	9	2	179	1	182	7	0	1	8	3	48	2	53	252
Total Volume	6	5	21	32	7	785	10	802	21	3	3	27	12	162	11	185	1046
% App. Total	18.8	15.6	65.6		0.9	97.9	1.2		77.8	11.1	11.1		6.5	87.6	5.9		
PHF	.500	.625	.750	.800	.583	.892	.500	.891	.750	.250	.375	.844	.600	.827	.550	.841	.883

Peak Hour Analysis From 12:00 to 17:45 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 16:45

16:45	1	0	3	4	5	80	3	88	3	0	9	12	12	210	16	238	342
17:00	2	0	4	6	5	94	6	105	3	0	4	7	9	173	13	195	313
17:15	2	1	5	8	7	87	2	96	6	1	3	10	12	201	18	231	345
17:30	2	0	2	4	3	104	0	107	4	0	1	5	15	175	15	205	321
Total Volume	7	1	14	22	20	365	11	396	16	1	17	34	48	759	62	869	1321
% App. Total	31.8	4.5	63.6		5.1	92.2	2.8		47.1	2.9	50		5.5	87.3	7.1		
PHF	.875	.250	.700	.688	.714	.877	.458	.925	.667	.250	.472	.708	.800	.904	.861	.913	.957



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

Study Name : TMC 1340  
Study Date : 09/24/13  
Page No. : 1

**Signal Warrants - Summary**

**Major Street Approaches**

**Eastbound: CSAH 23**  
Number of Lanes: 1  
85% Speed > 40 MPH.  
Total Approach Volume: 1,975

**Westbound: CSAH 23**  
Number of Lanes: 1  
85% Speed > 40 MPH.  
Total Approach Volume: 2,178

**Minor Street Approaches**

**Northbound: Restwood Rd**  
Number of Lanes: 1  
  
Total Approach Volume: 139

**Southbound: Highway Dr N**  
Number of Lanes: 1  
  
Total Approach Volume: 121

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

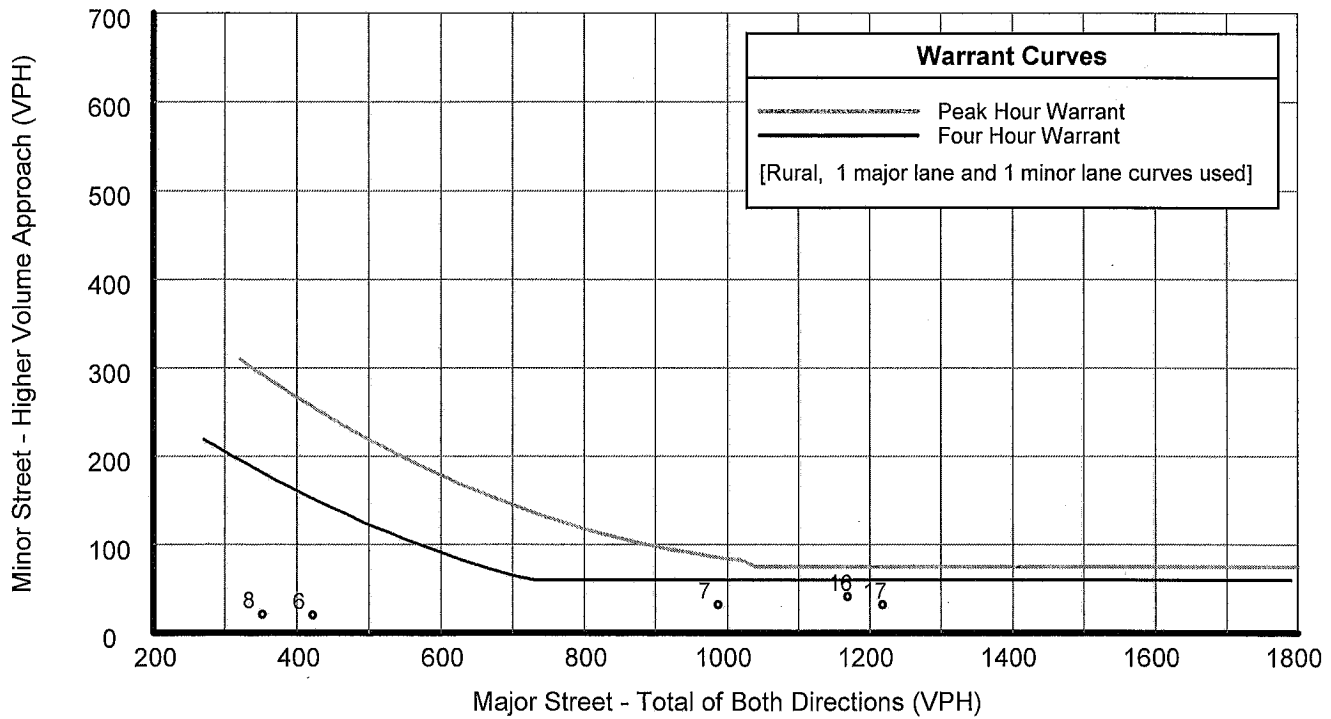
- Warrant 1 - Eight Hour Vehicular Volumes** ..... Not Satisfied
  - Warrant 1A - Minimum Vehicular Volume** ..... Not Satisfied  
Required volumes reached for 0 hours, 8 are needed
  - Warrant 1B - Interruption of Continuous Traffic** ..... Not Satisfied  
Required volumes reached for 0 hours, 8 are needed
  - Warrant 1 A&B - Combination of Warrants** ..... Not Satisfied  
Required volumes reached for 0 hours, 8 are needed
  
- Warrant 2 - Four Hour Volumes** ..... Not Satisfied  
Number of hours (0) volumes exceed minimum < minimum required (4).
  
- Warrant 3 - Peak Hour** ..... Not Satisfied
  - Warrant 3A - Peak Hour Delay** ..... Not Satisfied  
Approach volumes on minor street don't exceed minimums for any hour. Delay data not evaluated.
  - Warrant 3B - Peak Hour Volumes** ..... Not Satisfied  
Volumes do not exceed minimums for any hour.
  
- Warrant 4 - Pedestrian Volumes** ..... Not Evaluated
  
- Warrant 5 - School Crossing** ..... Not Evaluated
  
- Warrant 6 - Coordinated Signal System** ..... Not Evaluated
  
- Warrant 7 - Crash Experience** ..... Not Evaluated
  
- Warrant 8 - Roadway Network** ..... Not Evaluated
  
- Warrant 9 - Intersection Near a Grade Crossing** ..... Not Evaluated



# ANOKA COUNTY HIGHWAY PC-WARRANTS TRAFFIC SIGNAL WARRANT ANALYSIS

Study Name : TMC 1340  
Study Date : 09/24/13  
Page No. : 2

## Signal Warrants - Summary



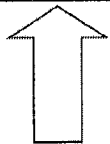
### Analysis of 8-Hour Volume Warrants:

#### War 1A-Minimum Volume

#### War 1B-Interruption of Traffic

#### War 1C-Combination of Warrants

Hour Begin	Major Total	Minor Vol Dir	Maj 350	Min 105	Hour Begin	Major Total	Minor Vol Dir	Maj 525	Min 53	Hour Begin	Major Total	Minor Vol Dir	Maj 420	Min 84
16:45	1,265	34 NB	Yes	No	16:45	1,265	34 NB	Yes	No	16:45	1,265	34 NB	Yes	No
16:30	1,243	36 NB	Yes	No	16:30	1,243	36 NB	Yes	No	16:30	1,243	36 NB	Yes	No
17:00	1,218	32 NB	Yes	No	17:00	1,218	32 NB	Yes	No	17:00	1,218	32 NB	Yes	No
16:15	1,177	33 SB	Yes	No	16:15	1,177	33 SB	Yes	No	16:15	1,177	33 SB	Yes	No
16:00	1,169	41 SB	Yes	No	16:00	1,169	41 SB	Yes	No	16:00	1,169	41 SB	Yes	No
07:00	987	32 SB	Yes	No	07:00	987	32 SB	Yes	No	07:00	987	32 SB	Yes	No
06:45	963	28 NB	Yes	No	06:45	963	28 NB	Yes	No	06:45	963	28 NB	Yes	No
07:15	940	35 SB	Yes	No	07:15	940	35 SB	Yes	No	07:15	940	35 SB	Yes	No
17:15	919	25 NB	Yes	No	17:15	919	25 NB	Yes	No	17:15	919	25 NB	Yes	No
06:30	894	33 NB	Yes	No	06:30	894	33 NB	Yes	No	06:30	894	33 NB	Yes	No
07:30	866	35 NB	Yes	No	07:30	866	35 NB	Yes	No	07:30	866	35 NB	Yes	No
15:45	844	37 SB	Yes	No	15:45	844	37 SB	Yes	No	15:45	844	37 SB	Yes	No
06:15	659	26 NB	Yes	No	06:15	659	26 NB	Yes	No	06:15	659	26 NB	Yes	No
17:30	593	15 NB	Yes	No	17:30	593	15 NB	Yes	No	17:30	593	15 NB	Yes	No
07:45	586	29 NB	Yes	No	07:45	586	29 NB	Yes	No	07:45	586	29 NB	Yes	No
15:30	555	23 SB	Yes	No	15:30	555	23 SB	Yes	No	15:30	555	23 SB	Yes	No
06:00	422	20 NB	Yes	No	06:00	422	20 NB	No	No	06:00	422	20 NB	Yes	No
08:00	351	21 NB	Yes	No	08:00	351	21 NB	No	No	08:00	351	21 NB	No	No
15:15	294	15 SB	No	No	15:15	294	15 SB	No	No	15:15	294	15 SB	No	No
17:45	281	10 NB	No	No	17:45	281	10 NB	No	No	17:45	281	10 NB	No	No
05:45	211	11 NB	No	No	05:45	211	11 NB	No	No	05:45	211	11 NB	No	No
08:15	161	11 NB	No	No	08:15	161	11 NB	No	No	08:15	161	11 NB	No	No
18:00	2	1 SB	No	No	18:00	2	1 SB	No	No	18:00	2	1 SB	No	No
15:00	2	1 SB	No	No	15:00	2	1 SB	No	No	15:00	2	1 SB	No	No



NORTH

COUNT LOCATION:

CSAH 23 (Lake Dr.) @

DATE:

09/04/2013

Highway Dr N./Restwood Rd.

APP. #1 = CSAH 23

APP. #2 = Highway Dr N

APP. #3 = CSAH 23

APP. #4 = Restwood Rd.

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
6:30-6:45						3		1
6:45-7:00				1	1	5		1
<b>HOURLY TOTAL</b>					<b>1</b>	<b>HOURLY TOTAL</b>		<b>10</b>
7:00-7:15AM		1			1	4		4
7:15-7:30	1				1	2		
7:30-7:45						3		5
7:45-8:00	1				1	4		4
<b>HOURLY TOTAL</b>					<b>3</b>	<b>HOURLY TOTAL</b>		<b>26</b>
8:00-8:15AM						4		3
8:15-8:30						5		2
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>14</b>
					<b>TOTAL 4</b>		<b>TOTAL</b>	<b>50</b>

TIME	PEDESTRIANS					HEAVY VEHICLES		
	APP. #1	APP. #2	APP. #3	APP. #4	15 MIN TOT	TRUCKS	RV	BUS
4:00-4:15PM						3		9
4:15-4:30						5		3
4:30-4:45						3		5
4:45-5:00						6		1
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>35</b>
5:00-5:15PM						4		1
5:15-5:30						2		2
5:30-5:45								1
5:45-6:00						4		
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>14</b>
					<b>TOTAL</b>		<b>TOTAL</b>	<b>49</b>