

Date : 03/12/14

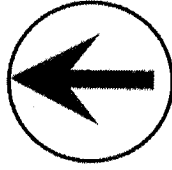
Count Number : TMC1404

Location : CSAH 23 (Lake Dr.)

@ Albert Ave.

Collection Period : PEAK HOURS

6-9 AM, 4-7 PM



North

N. Highway Dr. Access
#2
411

170			
46	D		
20	F		
104	T		

241

146	G	3034	2470
2861	H		
27	J		

CSAH 23

#3

5504

2942			
82	C		
2333	B		
28	A		

#1

5385

CSAH 23

	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

Albert Ave.

35	M	81
13	L	
33	K	

75

#4

156

Anoka County Highway Department
Traffic Volume and Turning
Movement Study

Date : 03/12/14

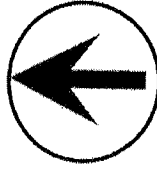
Count Number : TMC1404

Location : CSAH 23 (Lake Dr.)

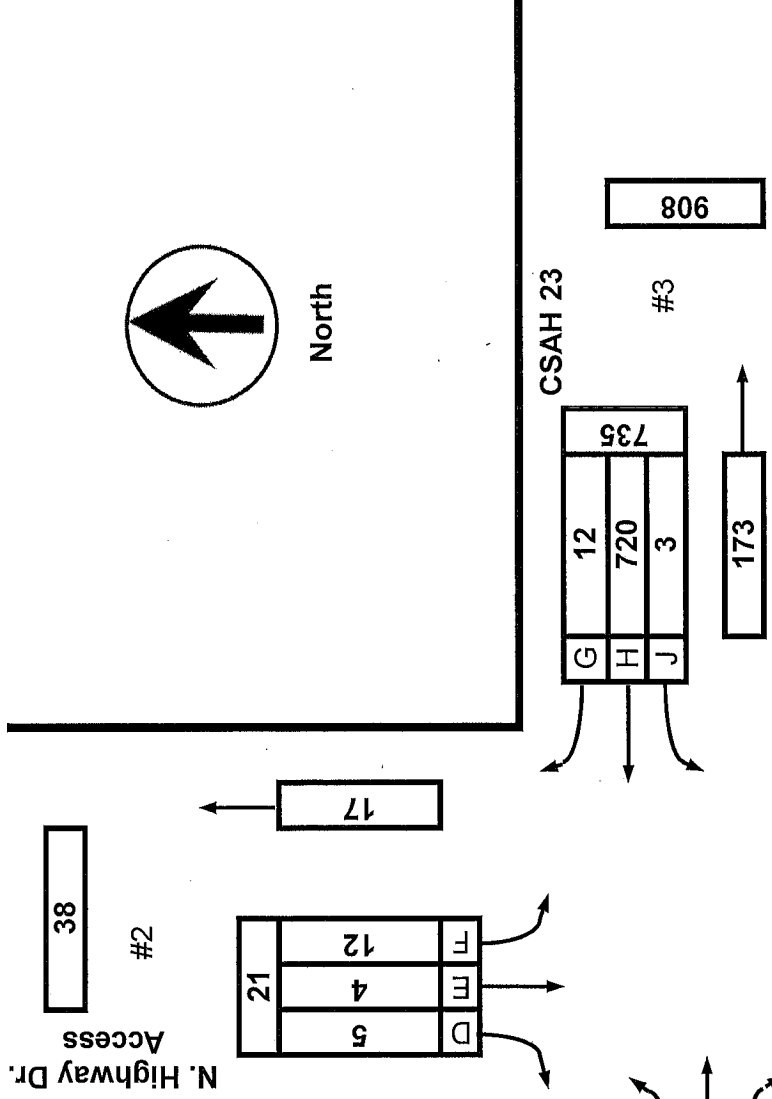
@ Albert Ave.

Collection Period : AM PEAK

Hour : 7:00 - 8:00 AM

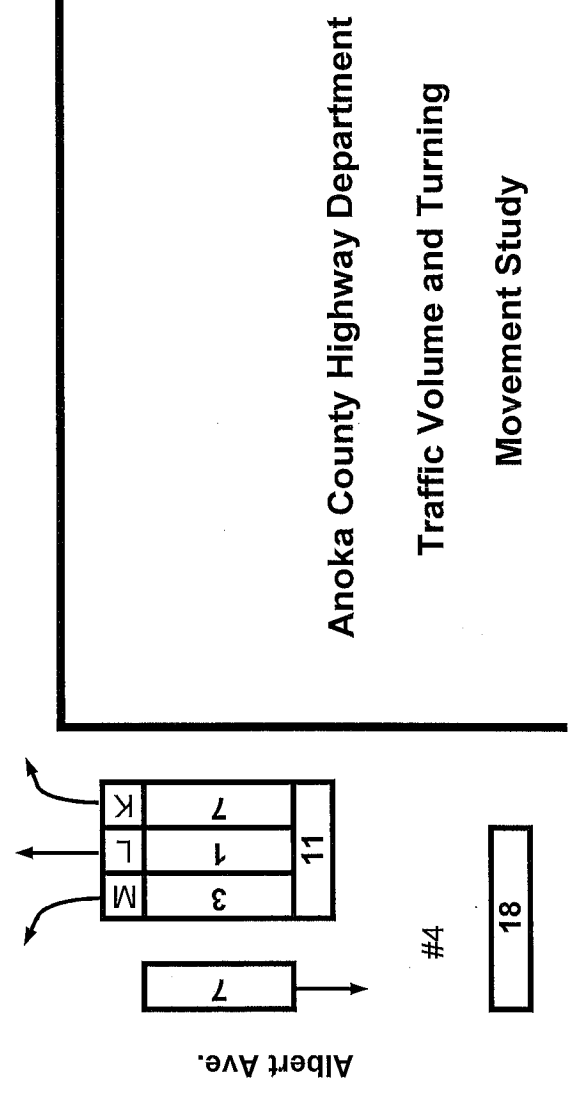


North



CSAH 23

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 : 03/12/14

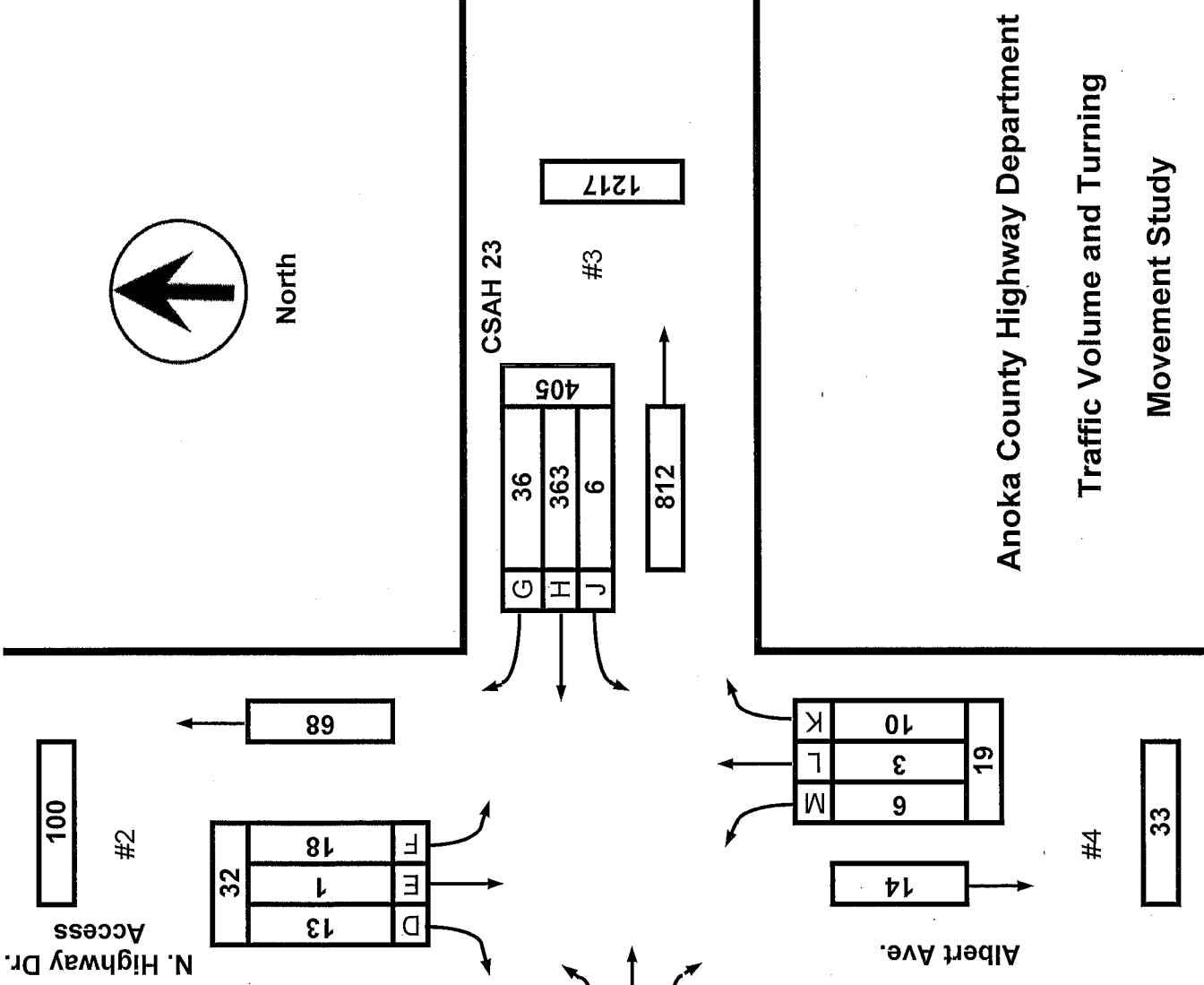
Count Number : TMC1404

Location : CSAH 23 (Lake Dr.)

@ Albert Ave.

Collection Period : PM PEAK

Hour : 4:00 PM - 5:00 PM



	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

Weather: Cool and Clear

Counter: DB-400

study conducted by: Josie/Terri

File Name : TMC1404

Site Code : 14040202

Start Date : 03/12/2014

Page No : 1

Groups Printed- Unshifted

Start Time	North Highway Dr Access Southbound					CSAH 23 Westbound					Albert Ave 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			
06:00	4	2	2	0	8	0	102	0	3	102	4	0	0	0	4	0	8	1	1	9	4	123	127
06:15	1	0	3	0	4	1	140	2	1	143	0	0	0	0	0	3	23	0	3	26	4	173	177
06:30	5	1	4	0	10	0	170	2	1	172	3	0	1	0	4	0	33	0	2	33	3	219	222
06:45	4	1	1	0	6	0	148	1	1	149	2	0	0	0	2	2	35	1	3	38	4	195	199
Total	14	4	10	0	28	1	560	5	6	566	9	0	1	0	10	5	99	2	9	106	15	710	725
07:00	4	0	1	0	5	0	180	2	4	182	0	0	0	0	0	0	29	0	2	29	6	216	222
07:15	4	1	1	0	6	0	187	2	2	189	1	0	1	0	2	1	40	0	2	41	4	238	242
07:30	1	1	2	0	4	2	195	4	3	201	1	1	2	1	4	1	35	0	4	36	8	245	253
07:45	3	2	1	1	6	1	158	4	5	163	1	0	4	1	5	2	50	0	6	52	13	226	239
Total	12	4	5	1	21	3	720	12	14	735	3	1	7	2	11	4	154	0	14	158	31	925	956
08:00	2	1	0	1	3	1	146	4	1	151	1	0	0	0	1	1	42	0	1	43	3	198	201
08:15	4	1	0	0	5	0	156	3	10	159	1	1	0	0	2	1	32	0	0	33	10	199	209
08:30	3	2	2	0	7	2	125	3	8	130	2	1	0	0	3	2	39	0	4	41	12	181	193
08:45	3	0	1	1	4	2	103	4	2	109	1	1	2	0	4	4	62	1	5	67	8	184	192
Total	12	4	3	2	19	5	530	14	21	549	5	3	2	0	10	8	175	1	10	184	33	762	795

*** BREAK ***

16:00	3	1	6	0	10	4	103	13	2	120	1	0	2	1	3	7	172	1	3	180	6	313	319
16:15	1	0	4	0	5	1	80	7	2	88	2	1	4	0	7	7	202	3	2	212	4	312	316
16:30	12	0	1	1	13	0	89	5	1	94	2	0	1	0	3	6	198	1	1	205	3	315	318
16:45	2	0	2	0	4	1	91	11	1	103	1	2	3	0	6	9	212	2	2	223	3	336	339
Total	18	1	13	1	32	6	363	36	6	405	6	3	10	1	19	29	784	7	8	820	16	1276	1292
17:00	3	2	1	0	6	2	95	16	2	113	1	0	1	0	2	5	167	1	1	173	3	294	297
17:15	10	1	1	0	12	3	83	11	0	97	2	1	3	0	6	5	203	4	1	212	1	327	328
17:30	5	0	4	0	9	2	89	16	4	107	1	1	2	0	4	5	160	2	1	167	5	287	292
17:45	3	0	3	0	6	1	87	8	0	96	0	1	2	0	3	9	152	2	2	163	2	268	270
Total	21	3	9	0	33	8	354	51	6	413	4	3	8	0	15	24	682	9	5	715	11	1176	1187
18:00	5	0	3	0	8	1	114	6	0	121	2	0	0	0	2	2	123	3	3	128	3	259	262
18:15	8	0	0	0	8	0	89	9	1	98	2	1	1	0	4	4	87	2	2	93	3	203	206
18:30	6	1	1	0	8	1	77	5	1	83	1	1	4	0	6	4	120	1	1	125	2	222	224
18:45	8	3	2	0	13	2	54	8	0	64	3	1	0	0	4	2	109	3	0	114	0	195	195
Total	27	4	6	0	37	4	334	28	2	366	8	3	5	0	16	12	439	9	6	460	8	879	887
Grand Total	104	20	46	4	170	27	2861	146	55	3034	35	13	33	3	81	82	2333	28	52	2443	114	5728	5842
Apprch %	61.2	11.8	27.1			0.9	94.3	4.8			43.2	16	40.7			3.4	95.5	1.1					
Total %	1.8	0.3	0.8		3	0.5	49.9	2.5		53	0.6	0.2	0.6		1.4	1.4	40.7	0.5		42.7	2	98	

Start Time	North Highway Dr Access Southbound				CSAH 23 Westbound				Albert Ave 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	
Peak Hour Analysis From 06:00 to 11:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	4	0	1	5	0	180	2	182	0	0	0	0	0	29	0	29	216
07:15	4	1	1	6	0	187	2	189	1	0	1	2	1	40	0	41	238
07:30	1	1	2	4	2	195	4	201	1	1	2	4	1	35	0	36	245
07:45	3	2	1	6	1	158	4	163	1	0	4	5	2	50	0	52	226
Total Volume	12	4	5	21	3	720	12	735	3	1	7	11	4	154	0	158	925
% App. Total	57.1	19	23.8		0.4	98	1.6		27.3	9.1	63.6		2.5	97.5	0		
PHF	.750	.500	.625	.875	.375	.923	.750	.914	.750	.250	.438	.550	.500	.770	.000	.760	.944

Peak Hour Analysis From 12:00 to 18:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:00																	
16:00	3	1	6	10	4	103	13	120	1	0	2	3	7	172	1	180	313
16:15	1	0	4	5	1	80	7	88	2	1	4	7	7	202	3	212	312
16:30	12	0	1	13	0	89	5	94	2	0	1	3	6	198	1	205	315
16:45	2	0	2	4	1	91	11	103	1	2	3	6	9	212	2	223	336
Total Volume	18	1	13	32	6	363	36	405	6	3	10	19	29	784	7	820	1276
% App. Total	56.2	3.1	40.6		1.5	89.6	8.9		31.6	15.8	52.6		3.5	95.6	0.9		
PHF	.375	.250	.542	.615	.375	.881	.692	.844	.750	.375	.625	.679	.806	.925	.583	.919	.949



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

Study Name : TMC1404
Study Date : 03/18/14
Page No. : 1

Signal Warrants - Summary

Major Street Approaches

Eastbound: CSAH 23
Number of Lanes: 1
85% Speed > 40 MPH.
Total Approach Volume: 2,445

Westbound: CSAH 23
Number of Lanes: 1
85% Speed > 40 MPH.
Total Approach Volume: 3,036

Minor Street Approaches

Northbound: Albert Ave
Number of Lanes: 1

Total Approach Volume: 83

Southbound: North Highway Dr Access
Number of Lanes: 1

Total Approach Volume: 172

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**

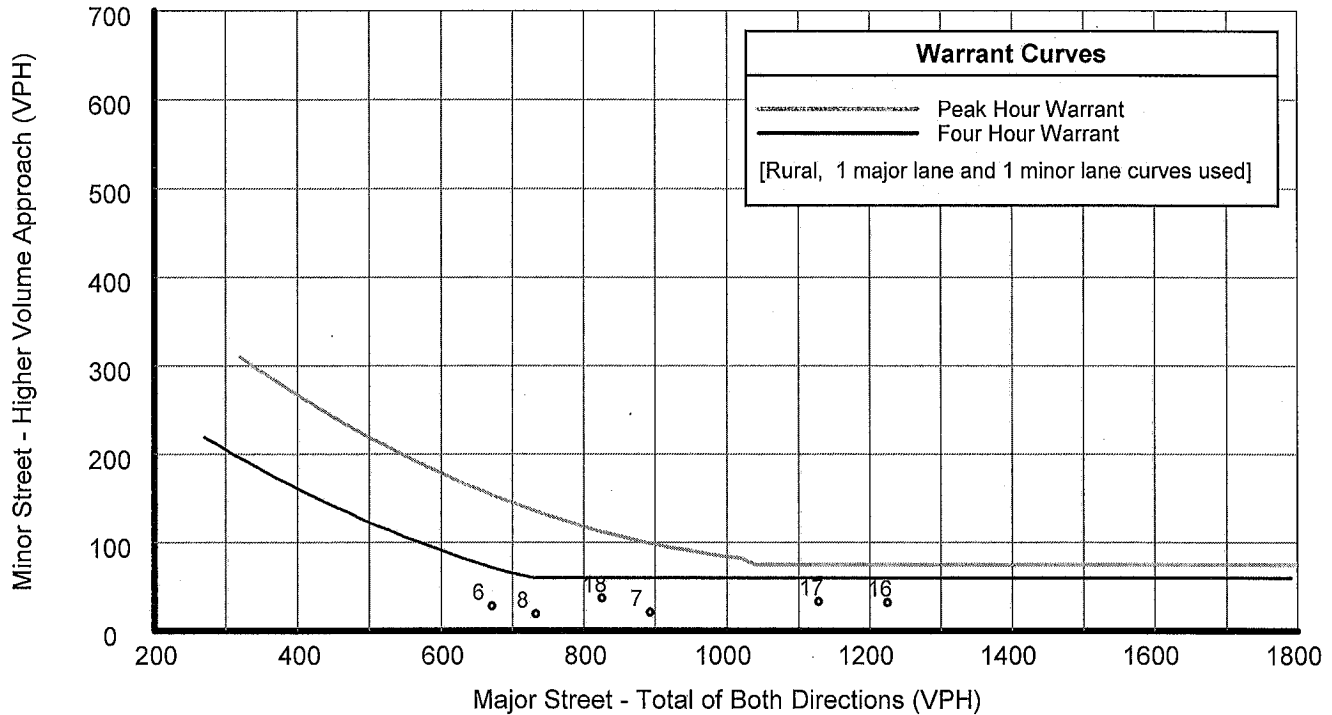
- Warrant 9 - Intersection Near a Grade Crossing** **Not Evaluated**



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

Study Name : TMC1404
Study Date : 03/18/14
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
16:00	1,225	32 SB	Yes	No	16:00	1,225	32 SB	Yes	No	16:00	1,225	32 SB	Yes	No
16:30	1,220	35 SB	Yes	No	16:30	1,220	35 SB	Yes	No	16:30	1,220	35 SB	Yes	No
16:15	1,211	28 SB	Yes	No	16:15	1,211	28 SB	Yes	No	16:15	1,211	28 SB	Yes	No
16:45	1,195	31 SB	Yes	No	16:45	1,195	31 SB	Yes	No	16:45	1,195	31 SB	Yes	No
17:00	1,128	33 SB	Yes	No	17:00	1,128	33 SB	Yes	No	17:00	1,128	33 SB	Yes	No
17:15	1,091	35 SB	Yes	No	17:15	1,091	35 SB	Yes	No	17:15	1,091	35 SB	Yes	No
17:30	973	31 SB	Yes	No	17:30	973	31 SB	Yes	No	17:30	973	31 SB	Yes	No
17:45	907	30 SB	Yes	No	17:45	907	30 SB	Yes	No	17:45	907	30 SB	Yes	No
15:45	900	28 SB	Yes	No	15:45	900	28 SB	Yes	No	15:45	900	28 SB	Yes	No
07:00	893	21 SB	Yes	No	07:00	893	21 SB	Yes	No	07:00	893	21 SB	Yes	No
07:15	876	19 SB	Yes	No	07:15	876	19 SB	Yes	No	07:15	876	19 SB	Yes	No
06:45	865	21 SB	Yes	No	06:45	865	21 SB	Yes	No	06:45	865	21 SB	Yes	No
07:30	838	18 SB	Yes	No	07:30	838	18 SB	Yes	No	07:30	838	18 SB	Yes	No
06:30	833	27 SB	Yes	No	06:30	833	27 SB	Yes	No	06:30	833	27 SB	Yes	No
18:00	826	37 SB	Yes	No	18:00	826	37 SB	Yes	No	18:00	826	37 SB	Yes	No
07:45	772	21 SB	Yes	No	07:45	772	21 SB	Yes	No	07:45	772	21 SB	Yes	No
06:15	772	25 SB	Yes	No	06:15	772	25 SB	Yes	No	06:15	772	25 SB	Yes	No
08:00	733	19 SB	Yes	No	08:00	733	19 SB	Yes	No	08:00	733	19 SB	Yes	No
06:00	672	28 SB	Yes	No	06:00	672	28 SB	Yes	No	06:00	672	28 SB	Yes	No
15:30	602	15 SB	Yes	No	15:30	602	15 SB	Yes	No	15:30	602	15 SB	Yes	No
18:15	577	29 SB	Yes	No	18:15	577	29 SB	Yes	No	18:15	577	29 SB	Yes	No
08:15	539	16 SB	Yes	No	08:15	539	16 SB	Yes	No	08:15	539	16 SB	Yes	No
05:45	485	22 SB	Yes	No	05:45	485	22 SB	No	No	05:45	485	22 SB	Yes	No
18:30	386	21 SB	Yes	No	18:30	386	21 SB	No	No	18:30	386	21 SB	No	No



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

Study Name : TMC1404
Study Date : 03/18/14
Page No. : 1

Multi-Way Stop Warrant Report

Major Street Approaches

Eastbound: CSAH 23
Total Approach Volume: 2,445
85% Speed > 40 MPH.

Westbound: CSAH 23
Total Approach Volume: 3,036
85% Speed > 40 MPH.

Minor Street Approaches

Northbound: Albert Ave
Total Approach Volume: 83

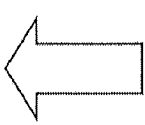
Southbound: North Highway Dr Access
Total Approach Volume: 172

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 0 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?
05:30 - 06:30	280	16	210-Yes	140-No	Major	240-Yes	160-No	Major
05:45 - 06:45	485	30	210-Yes	140-No	Major	240-Yes	160-No	Major
06:00 - 07:00	672	38	210-Yes	140-No	Major	240-Yes	160-No	Major
06:15 - 07:15	772	31	210-Yes	140-No	Major	240-Yes	160-No	Major
06:30 - 07:30	833	35	210-Yes	140-No	Major	240-Yes	160-No	Major
06:45 - 07:45	865	29	210-Yes	140-No	Major	240-Yes	160-No	Major
07:00 - 08:00	893	32	210-Yes	140-No	Major	240-Yes	160-No	Major
07:15 - 08:15	876	31	210-Yes	140-No	Major	240-Yes	160-No	Major
07:30 - 08:30	838	30	210-Yes	140-No	Major	240-Yes	160-No	Major
07:45 - 08:45	772	32	210-Yes	140-No	Major	240-Yes	160-No	Major
08:00 - 09:00	733	29	210-Yes	140-No	Major	240-Yes	160-No	Major
08:15 - 09:15	539	26	210-Yes	140-No	Major	240-Yes	160-No	Major
08:30 - 09:30	347	20	210-Yes	140-No	Major	240-Yes	160-No	Major
15:15 - 16:15	302	14	210-Yes	140-No	Major	240-Yes	160-No	Major
15:30 - 16:30	602	25	210-Yes	140-No	Major	240-Yes	160-No	Major
15:45 - 16:45	900	41	210-Yes	140-No	Major	240-Yes	160-No	Major
16:00 - 17:00	1,225	51	210-Yes	140-No	Major	240-Yes	160-No	Major
16:15 - 17:15	1,211	46	210-Yes	140-No	Major	240-Yes	160-No	Major
16:30 - 17:30	1,220	52	210-Yes	140-No	Major	240-Yes	160-No	Major
16:45 - 17:45	1,195	49	210-Yes	140-No	Major	240-Yes	160-No	Major
17:00 - 18:00	1,128	48	210-Yes	140-No	Major	240-Yes	160-No	Major
17:15 - 18:15	1,091	50	210-Yes	140-No	Major	240-Yes	160-No	Major
17:30 - 18:30	973	44	210-Yes	140-No	Major	240-Yes	160-No	Major
17:45 - 18:45	907	45	210-Yes	140-No	Major	240-Yes	160-No	Major



NORTH

COUNT LOCATION:

CSAH 23 (Lake Dr.)

DATE:

03/12/2014

@ Albert Ave.

APP. #1 = N. Highway Dr. Access

APP. #2 = CSAH 23

APP. #3= Albert Ave

APP. #4= CSAH 23

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
6:00-6:15AM						3		1
6:15-6:30						4		
6:30-6:45						3		
6:45-7:00						3		1
HOURLY TOTAL						HOURLY TOTAL		15
7:00-7:15AM						4		1
7:15-7:30						2		1
7:30-7:45						5		3
7:45-8:00						6		7
HOURLY TOTAL						HOURLY TOTAL		29
8:00-8:15AM						2		1
8:15-8:30						5		5
8:30-8:45						5		7
8:45-9:00						4		5
HOURLY TOTAL						HOURLY TOTAL		34
					TOTAL		TOTAL	78

TIME	PEDESTRIANS					HEAVY VEHICLES		
	APP. #1	APP. #2	APP. #3	APP. #4	15 MIN TOT	TRUCKS	RV	BUS
4:00-4:15PM						1		4
4:15-4:30						3		1
4:30-4:45						3		
4:45-5:00						1		1
HOURLY TOTAL						HOURLY TOTAL		14
5:00-5:15PM						3		1
5:15-5:30						1		
5:30-5:45						2		2
5:45-6:00						1		1
HOURLY TOTAL						HOURLY TOTAL		11
6:00-6:15PM						3		
6:15-6:30						3		
6:30-6:45						2		
6:45-7:00								
HOURLY TOTAL						HOURLY TOTAL		8
					TOTAL		TOTAL	33