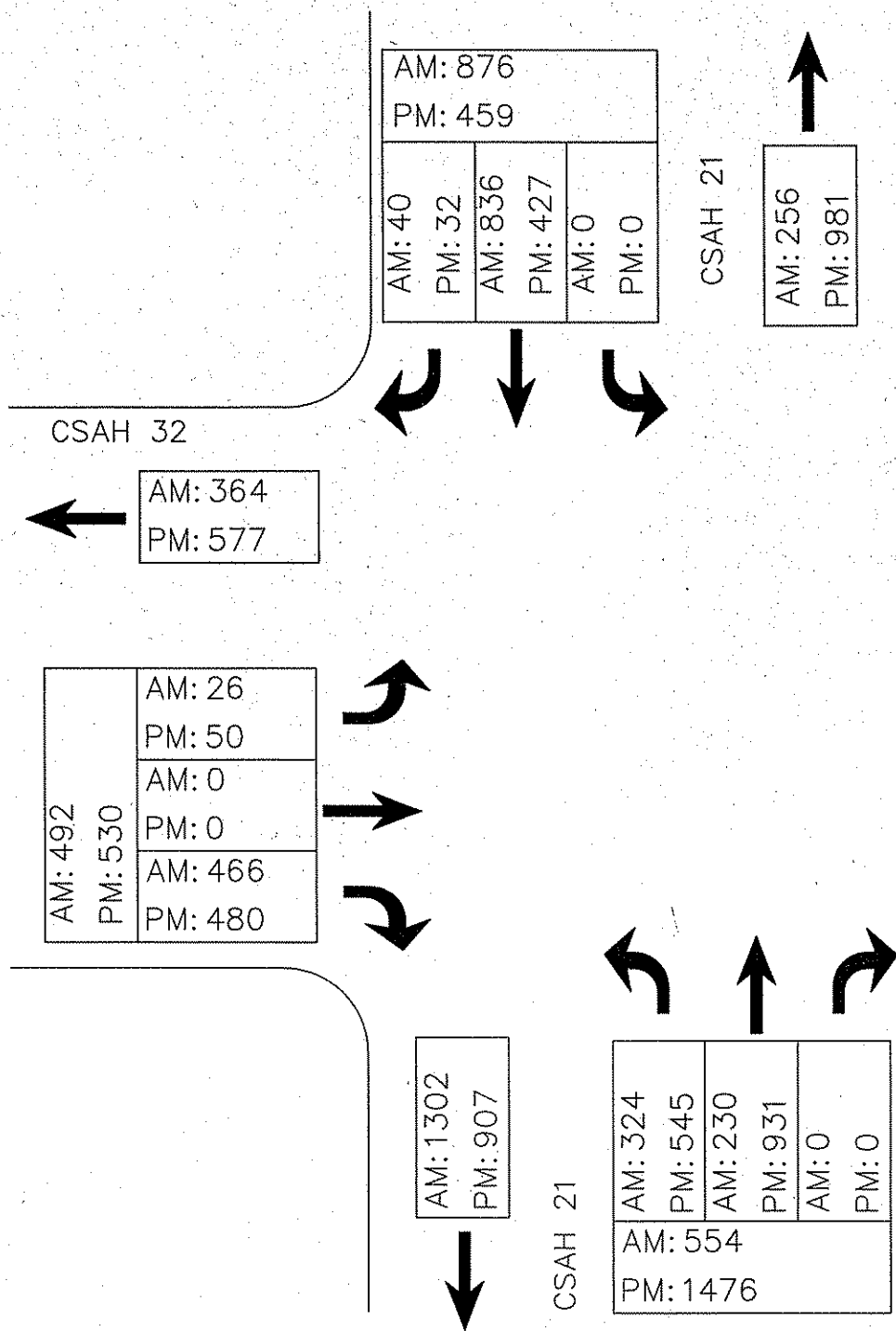


# ANOKA COUNTY HIGHWAY DEPARTMENT PEAK AM/PM TURNING MOVEMENT DIAGRAM

Location: C. S. A. H. 21 (CENTERVILLE RD.) @ CSAH 32 (ASH ST.)





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

Study Name : TMC0539  
Study Date : 12/06/05  
Page No. : 1

**Signal Warrants - Summary**

**Major Street Approaches**

**Northbound: CSAH 21**  
Number of Lanes: 1  
Approach Speed: 50  
Total Approach Volume: 2,030

**Southbound: CSAH 21**  
Number of Lanes: 1  
Approach Speed: 50  
Total Approach Volume: 1,335

**Minor Street Approaches**

**Eastbound: CSAH 32**  
Number of Lanes: 2  
Total Approach Volume: 1,022

**Westbound: None**  
Number of Lanes: 2  
Total Approach Volume: 0

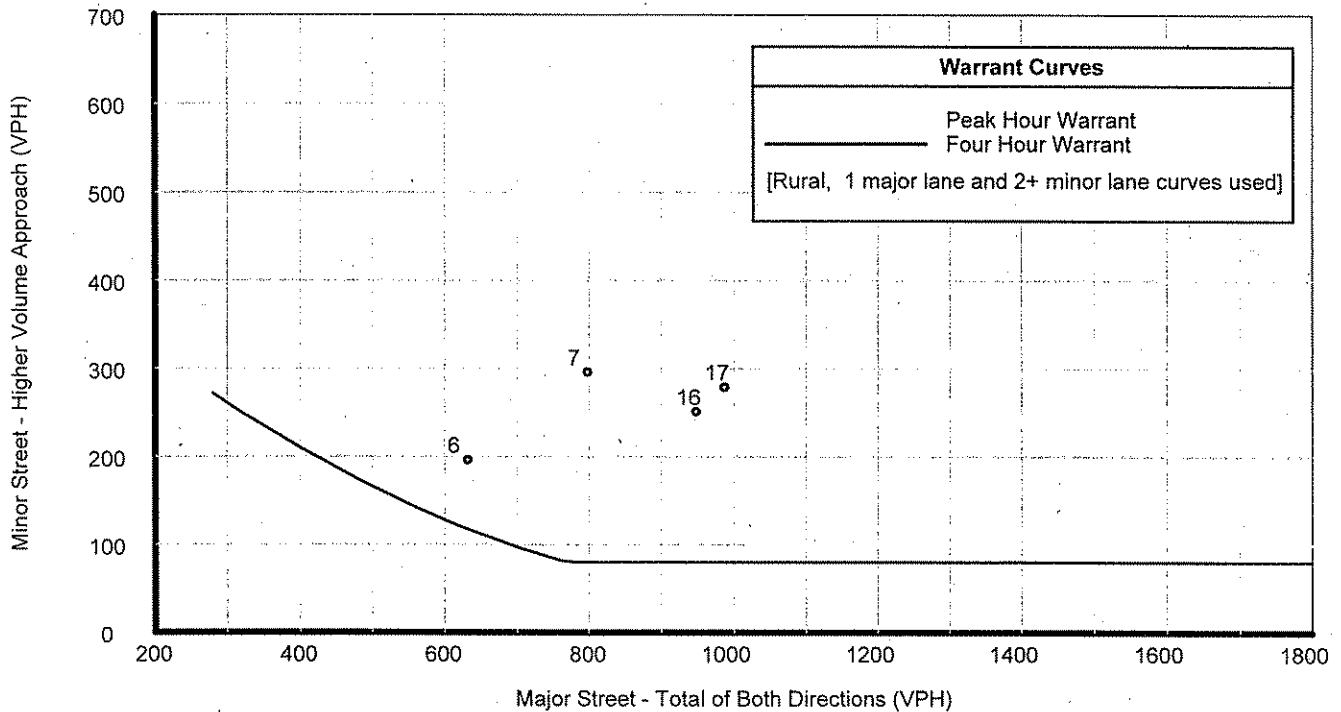
**Warrant Summary** (Rural values apply.)

<b>Warrant 1 - Eight Hour Vehicular Volumes</b> .....	Not Satisfied
<b>Warrant 1A - Minimum Vehicular Volume</b> .....	Not Satisfied
Required volumes reached for 4 hours, 8 are needed	
<b>Warrant 1B - Interruption of Continuous Traffic</b> .....	Not Satisfied
Required volumes reached for 4 hours, 8 are needed	
<b>Warrant 1 A&amp;B - Combination of Warrants</b> .....	Not Satisfied
Required volumes reached for 4 hours, 8 are needed	
<b>Warrant 2 - Four Hour Volumes</b> .....	Satisfied
Number of hours (4) volumes exceed minimum >= minimum required (4).	
<b>Warrant 3 - Peak Hour</b> .....	Satisfied
<b>Warrant 3A - Peak Hour Delay</b> .....	Satisfied
Number of hours (13) volumes exceed minimum >= required (1). Delay data not evaluated.	
<b>Warrant 3B - Peak Hour Volumes</b> .....	Satisfied
Volumes exceed minimums for at least one hour.	
<b>Warrant 4 - Pedestrian Volumes</b> .....	Not Evaluated
<b>Warrant 5 - School Crossing</b> .....	Not Evaluated
<b>Warrant 6 - Coordinated Signal System</b> .....	Not Evaluated
<b>Warrant 7 - Crash Experience</b> .....	Not Evaluated
<b>Warrant 8 - Roadway Network</b> .....	Not Evaluated

# ANOKA COUNTY HIGHWAY PC-WARRANTS TRAFFIC SIGNAL WARRANT ANALYSIS

Study Name : TMC0539  
Study Date : 12/06/05  
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	350-No	140-No	---	525-No	70-No	---	420-No	112-No	---
01:00	0	0	EB	350-No	140-No	---	525-No	70-No	---	420-No	112-No	---
02:00	0	0	EB	350-No	140-No	---	525-No	70-No	---	420-No	112-No	---
03:00	0	0	EB	350-No	140-No	---	525-No	70-No	---	420-No	112-No	---
04:00	0	0	EB	350-No	140-No	---	525-No	70-No	---	420-No	112-No	---
05:00	0	0	EB	350-No	140-No	---	525-No	70-No	---	420-No	112-No	---
06:00	632	196	EB	350-Yes	140-Yes	Both	525-Yes	70-Yes	Both	420-Yes	112-Yes	Both
07:00	798	296	EB	350-Yes	140-Yes	Both	525-Yes	70-Yes	Both	420-Yes	112-Yes	Both
08:00	0	0	EB	350-No	140-No	---	525-No	70-No	---	420-No	112-No	---
09:00	0	0	EB	350-No	140-No	---	525-No	70-No	---	420-No	112-No	---
10:00	0	0	EB	350-No	140-No	---	525-No	70-No	---	420-No	112-No	---
11:00	0	0	EB	350-No	140-No	---	525-No	70-No	---	420-No	112-No	---
12:00	0	0	EB	350-No	140-No	---	525-No	70-No	---	420-No	112-No	---
13:00	0	0	EB	350-No	140-No	---	525-No	70-No	---	420-No	112-No	---
14:00	0	0	EB	350-No	140-No	---	525-No	70-No	---	420-No	112-No	---
15:00	0	0	EB	350-No	140-No	---	525-No	70-No	---	420-No	112-No	---
16:00	948	251	EB	350-Yes	140-Yes	Both	525-Yes	70-Yes	Both	420-Yes	112-Yes	Both
17:00	987	279	EB	350-Yes	140-Yes	Both	525-Yes	70-Yes	Both	420-Yes	112-Yes	Both
18:00	0	0	EB	350-No	140-No	---	525-No	70-No	---	420-No	112-No	---
19:00	0	0	EB	350-No	140-No	---	525-No	70-No	---	420-No	112-No	---
20:00	0	0	EB	350-No	140-No	---	525-No	70-No	---	420-No	112-No	---
21:00	0	0	EB	350-No	140-No	---	525-No	70-No	---	420-No	112-No	---
22:00	0	0	EB	350-No	140-No	---	525-No	70-No	---	420-No	112-No	---
23:00	0	0	EB	350-No	140-No	---	525-No	70-No	---	420-No	112-No	---

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

Study Name : TMC0539B  
Study Date : 12/06/05  
Page No. : 1

**Signal Warrants - Summary - For proposed Multi-lane approaches**

**Major Street Approaches**

**Northbound: CSAH 21**  
Number of Lanes: 2  
Approach Speed: 50  
Total Approach Volume: 2,030

**Southbound: CSAH 21**  
Number of Lanes: 2  
Approach Speed: 50  
Total Approach Volume: 1,335

**Minor Street Approaches**

**Eastbound: CSAH 32**  
Number of Lanes: 2  
Total Approach Volume: 1,022

**Westbound: None**  
Number of Lanes: 2  
Total Approach Volume: 0

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

<b>Warrant 1 - Eight Hour Vehicular Volumes</b> .....	Not Satisfied
<b>Warrant 1A - Minimum Vehicular Volume</b> .....	Not Satisfied
Required volumes reached for 4 hours, 8 are needed	
<b>Warrant 1B - Interruption of Continuous Traffic</b> .....	Not Satisfied
Required volumes reached for 4 hours, 8 are needed	
<b>Warrant 1 A&amp;B - Combination of Warrants</b> .....	Not Satisfied
Required volumes reached for 4 hours, 8 are needed	
<b>Warrant 2 - Four Hour Volumes</b> .....	Satisfied
Number of hours (4) volumes exceed minimum >= minimum required (4).	
<b>Warrant 3 - Peak Hour</b> .....	Satisfied
<b>Warrant 3A - Peak Hour Delay</b> .....	Satisfied
Number of hours (13) volumes exceed minimum >= required (1). Delay data not evaluated.	
<b>Warrant 3B - Peak Hour Volumes</b> .....	Satisfied
Volumes exceed minimums for at least one hour.	
<b>Warrant 4 - Pedestrian Volumes</b> .....	Not Evaluated
<b>Warrant 5 - School Crossing</b> .....	Not Evaluated
<b>Warrant 6 - Coordinated Signal System</b> .....	Not Evaluated
<b>Warrant 7 - Crash Experience</b> .....	Not Evaluated
<b>Warrant 8 - Roadway Network</b> .....	Not Evaluated

# ANOKA COUNTY HIGHWAY

## PC-WARRANTS

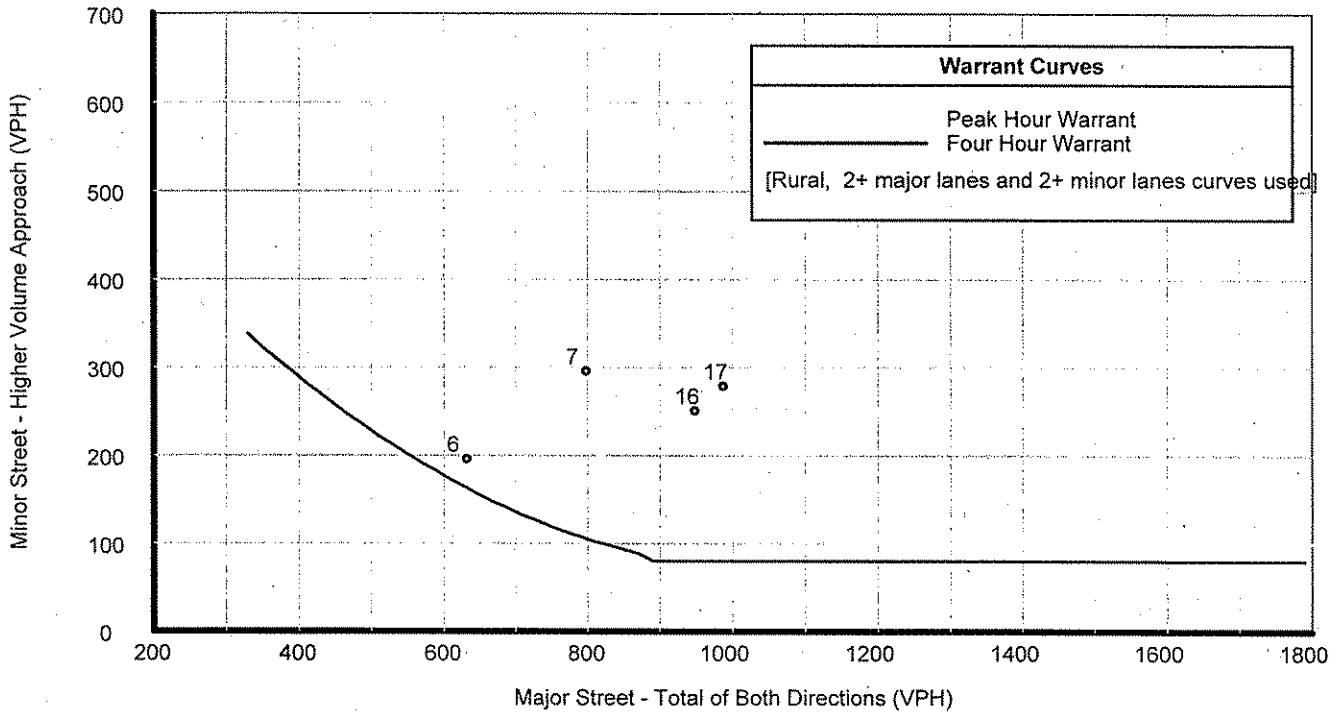
### TRAFFIC SIGNAL WARRANT ANALYSIS

Study Name : TMC0539B

Study Date : 12/06/05

Page No. : 2

## Signal Warrants - Summary - For proposed Multi-lane approaches



#### 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	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	632	196	EB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
07:00	798	296	EB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
08:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
09:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
10:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
11:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
12:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
13:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
14:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
15:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
16:00	948	251	EB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
17:00	987	279	EB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
18:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
19:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
20:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
21:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
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 : TMC0539  
Study Date : 11/17/05

**Multi-Way Stop Warrant Report**

**Major Street Approaches**

**Northbound: CSAH 21**  
Total Approach Volume: 2,030  
Approach Speed: 50

**Southbound: CSAH 21**  
Total Approach Volume: 1,335  
Approach Speed: 50

**Minor Street Approaches**

**Eastbound: CSAH 32**  
Total Approach Volume: 1,022

**Westbound: None**  
Total Approach Volume: 0

**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 4 hours, 8 are needed
- Criteria D - 80% of Volumes, Delays, and Crashes** ..... Not Evaluated  
Delay data not evaluated  
Required volumes reached for 4 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?
00:00 - 01:00	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
02:00 - 03:00	0	0	210-No	140-No	No	240-No	160-No	No
03:00 - 04:00	0	0	210-No	140-No	No	240-No	160-No	No
04:00 - 05:00	0	0	210-No	140-No	No	240-No	160-No	No
05:00 - 06:00	0	0	210-No	140-No	No	240-No	160-No	No
06:00 - 07:00	632	196	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
07:00 - 08:00	798	296	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
08:00 - 09:00	0	0	210-No	140-No	No	240-No	160-No	No
09:00 - 10:00	0	0	210-No	140-No	No	240-No	160-No	No
10:00 - 11:00	0	0	210-No	140-No	No	240-No	160-No	No
11:00 - 12:00	0	0	210-No	140-No	No	240-No	160-No	No
12:00 - 13:00	0	0	210-No	140-No	No	240-No	160-No	No
13:00 - 14:00	0	0	210-No	140-No	No	240-No	160-No	No
14:00 - 15:00	0	0	210-No	140-No	No	240-No	160-No	No
15:00 - 16:00	0	0	210-No	140-No	No	240-No	160-No	No
16:00 - 17:00	948	251	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
17:00 - 18:00	987	279	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
18:00 - 19:00	0	0	210-No	140-No	No	240-No	160-No	No
19:00 - 20:00	0	0	210-No	140-No	No	240-No	160-No	No
20:00 - 21:00	0	0	210-No	140-No	No	240-No	160-No	No
21:00 - 22:00	0	0	210-No	140-No	No	240-No	160-No	No
22:00 - 23:00	0	0	210-No	140-No	No	240-No	160-No	No
23:00 - 00:00	0	0	210-No	140-No	No	240-No	160-No	No



**COUNT LOCATION:**

CSAH 21 (Centerville Rd.) @

**DATE:**

11/01/2005

CSAH 32 (Ash St.)

**NORTH**

APP. #1 = CSAH 21

APP. #2 = None

APP. #3 = CSAH 21

APP. #4 = CSAH 32

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						1		
6:15-6:30								3
6:30-6:45						6		2
6:45-7:00						5		4
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>21</b>
7:00-7:15						6		2
7:15-7:30						2		1
7:30-7:45						7		4
7:45-8:00						9		3
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>34</b>
				<b>TOTAL</b>			<b>TOTAL</b>	<b>55</b>

4:00-4:15						4		1
4:15-4:30						7		4
4:30-4:45						8		2
4:45-5:00						5		1
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>32</b>
5:00-5:15						7		
5:15-5:30						4		1
5:30-5:45						4		
5:45-6:00						4		1
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>21</b>
				<b>TOTAL</b>			<b>TOTAL</b>	<b>53</b>