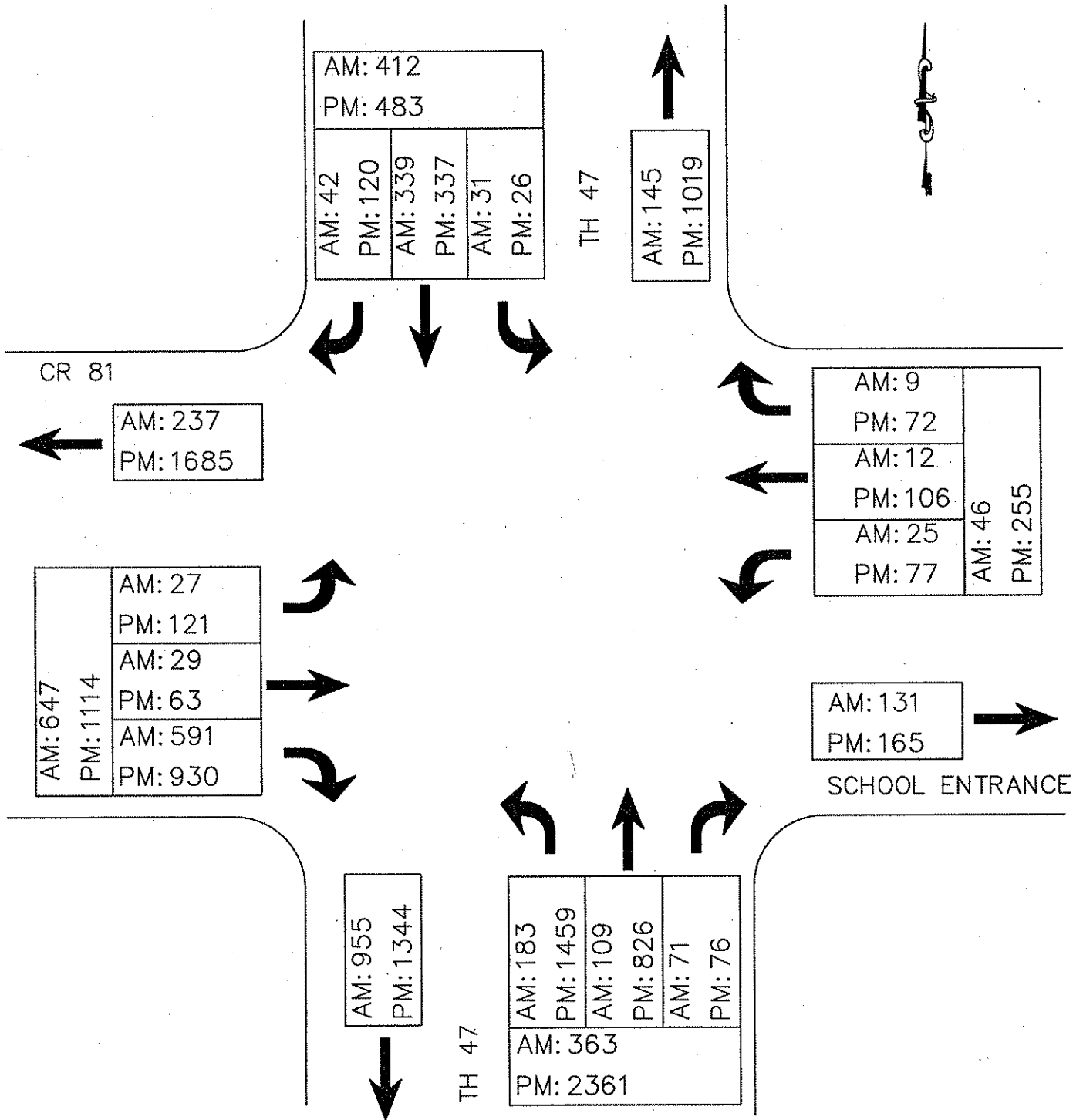


# ANOKA COUNTY HIGHWAY DEPARTMENT

## PEAK AM/PM TURNING MOVEMENT DIAGRAM

Location: T. H. 47 (SAINT FRANCIS BLVD.) @ CR 81 (PEDERSON DR.)



Anoka County Highway Department  
 Traffic Engineering  
 Traffic Volume and Turning Movement Study

File Name : TMC0434  
 Site Code : 04340101  
 Start Date : 11/03/2004  
 Page No : 1

Weather: Clear and Cool  
 Counter: TDC-8  
 Counted by: Josie/Terri

Groups Printed- Unshifted

Start Time	TH 47 Southbound					SCHOOL ENTRANCE Westbound					TH 47 Northbound					CR 81 Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Heavy	App. Total	Left	Thru	Right	Heavy	App. Total	Left	Thru	Right	Heavy	App. Total	Left	Thru	Right	Heavy	App. Total			
	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0				
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0				
06:00	2	52	3	1	57	0	0	0	0	0	13	7	2	0	22	2	0	68	0	70	1	149	150
06:15	0	33	4	3	37	0	0	0	0	0	8	10	1	1	19	1	1	75	1	77	5	133	138
06:30	1	44	7	5	52	0	0	0	0	0	13	8	4	0	25	1	2	60	0	63	5	140	145
06:45	10	30	7	1	47	3	4	0	0	7	22	9	12	0	43	3	4	79	4	86	5	183	188
Total	13	159	21	10	193	3	4	0	0	7	56	34	19	1	109	7	7	282	5	296	16	605	621
07:00	10	40	3	5	53	6	1	2	0	9	20	16	17	4	53	3	7	67	4	77	13	192	205
07:15	7	38	2	5	47	15	5	4	0	24	30	18	26	5	74	3	5	50	1	58	11	203	214
07:30	0	31	5	5	36	0	0	0	0	0	20	11	3	2	34	2	1	63	3	66	10	136	146
07:45	0	21	4	1	25	0	1	1	1	2	16	16	2	1	34	4	4	43	3	51	6	112	118
Total	17	130	14	16	161	21	7	7	1	35	86	61	48	12	195	12	17	223	11	252	40	643	683
08:00	1	31	1	5	33	0	0	2	0	2	28	8	1	3	37	1	2	32	1	35	9	107	116
08:15	0	19	6	0	25	1	1	0	0	2	13	6	3	1	22	7	3	54	7	64	8	113	121
*** BREAK ***																							
Total	1	50	7	5	58	1	1	2	0	4	41	14	4	4	59	8	5	86	8	99	17	220	237
13:30	1	16	3	3	20	0	0	0	0	0	34	19	0	2	53	4	0	35	2	39	7	112	119
13:45	1	7	5	0	13	0	3	0	0	3	39	19	0	6	58	8	6	40	2	54	8	128	136
Total	2	23	8	3	33	0	3	0	0	3	73	38	0	8	111	12	6	75	4	93	15	240	255
14:00	4	20	1	2	25	2	0	0	0	2	35	32	10	1	77	7	2	41	1	50	4	154	158
14:15	3	15	5	1	23	18	6	23	0	47	39	31	8	3	78	2	1	39	1	42	5	190	195
14:30	1	16	5	3	22	5	6	6	0	17	58	27	0	5	85	7	2	30	1	39	9	163	172
14:45	1	14	5	1	20	3	7	2	0	12	49	30	0	1	79	5	3	49	2	57	4	168	172
Total	9	65	16	7	90	28	19	31	0	78	181	120	18	10	319	21	8	159	5	188	22	675	697
15:00	2	18	9	2	29	4	2	5	0	11	57	25	5	2	87	4	3	39	3	46	7	173	180
15:15	4	15	6	2	25	2	4	4	1	10	79	44	3	2	126	5	3	28	0	36	5	197	202
15:30	6	15	3	0	24	23	8	9	1	40	69	48	21	3	138	5	6	46	0	57	4	259	263
15:45	0	9	6	1	15	8	13	5	0	26	83	49	10	3	142	3	1	30	0	34	4	217	221
Total	12	57	24	5	93	37	27	23	2	87	288	166	39	10	493	17	13	143	3	173	20	846	866
16:00	0	18	9	3	27	5	10	6	0	21	73	41	4	2	118	6	3	43	2	52	7	218	225
16:15	0	24	8	3	32	1	9	2	0	12	65	56	2	2	123	8	12	48	0	68	5	235	240
16:30	1	20	3	1	24	2	6	0	0	8	88	46	1	1	135	5	3	44	0	52	2	219	221
16:45	1	14	6	0	21	0	10	5	0	15	88	56	6	1	150	5	0	38	1	43	2	229	231
Total	2	76	26	7	104	8	35	13	0	56	314	199	13	6	526	24	18	173	3	215	16	901	917
17:00	0	11	4	0	15	0	2	3	0	5	76	52	0	2	128	9	5	45	2	59	4	207	211
17:15	0	13	10	5	23	1	4	0	0	5	98	53	2	1	153	5	1	54	0	60	6	241	247
17:30	0	11	2	0	13	1	8	0	0	9	89	49	0	0	138	5	0	52	1	57	1	217	218
17:45	0	17	7	1	24	1	1	0	0	2	82	39	0	1	121	6	4	48	1	58	3	205	208
Total	0	52	23	6	75	3	15	3	0	21	345	193	2	4	540	25	10	199	4	234	14	870	884
18:00	0	15	6	1	21	0	2	0	0	2	65	27	0	0	92	6	2	50	0	58	1	173	174
18:15	0	10	4	0	14	0	0	0	0	0	80	36	1	1	117	6	1	52	0	59	1	190	191
18:30	1	23	7	1	31	1	1	2	0	4	48	32	3	0	83	5	3	47	0	55	1	173	174
18:45	0	16	6	1	22	0	4	0	0	4	65	15	0	2	80	5	2	32	0	39	3	145	148
Total	1	64	23	3	88	1	7	2	0	10	258	110	4	3	372	22	8	181	0	211	6	681	687
Grand Total	57	676	162	62	895	102	118	81	3	301	1642	935	147	58	2724	148	92	1521	43	1761	166	5681	5847
Approch %	6.4	75.5	18.1			33.9	39.2	26.9			60.3	34.3	5.4			8.4	5.2	86.4			2.8	97.2	
Total %	1.0	11.9	2.9		15.8	1.8	2.1	1.4		5.3	28.9	16.5	2.6		47.9	2.6	1.6	26.8		31.0			

# ANOKA COUNTY HIGHWAY

## PC-WARRANTS

### TRAFFIC SIGNAL WARRANT ANALYSIS

Study Name : TMC0434

Study Date : 12/06/04

Page No. : 1

## Signal Warrants - Summary

### Major Street Approaches

**Northbound: TH 47**

Number of Lanes: 2

Approach Speed: 50

Total Approach Volume: 2,724

**Southbound: TH 47**

Number of Lanes: 2

Approach Speed: 50

Total Approach Volume: 895

### Minor Street Approaches

**Eastbound: CR 81**

Number of Lanes: 1

Total Approach Volume: 1,761

**Westbound: SCHOOL ENTRANCE**

Number of Lanes: 1

Total Approach Volume: 301

## Warrant Summary (Rural values apply.)

**Warrant 1 - Eight Hour Vehicular Volumes** ..... Not Satisfied

**Warrant 1A - Minimum Vehicular Volume** ..... Not Satisfied

Required volumes reached for 4 hours, 8 are needed

**Warrant 1B - Interruption of Continuous Traffic** ..... Not Satisfied

Required volumes reached for 1 hours, 8 are needed

**Warrant 1 A&B - Combination of Warrants** ..... Not Satisfied

Required volumes reached for 3 hours, 8 are needed

**Warrant 2 - Four Hour Volumes** ..... Satisfied

Number of hours (6) volumes exceed minimum  $\geq$  minimum required (4).

**Warrant 3 - Peak Hour** ..... Satisfied

**Warrant 3A - Peak Hour Volumes** ..... Satisfied

Volumes exceed minimums for at least one hour.

**Warrant 3B - Peak Hour Delay** ..... Satisfied

Number of hours (10) volumes exceed minimum  $\geq$  required (1). Delay data not evaluated.

**Warrant 4 - Pedestrian Volumes** ..... Not Evaluated

**Warrant 5 - School Crossing** ..... Not Evaluated

**Warrant 6 - Coordinated Signal System** ..... Not Evaluated

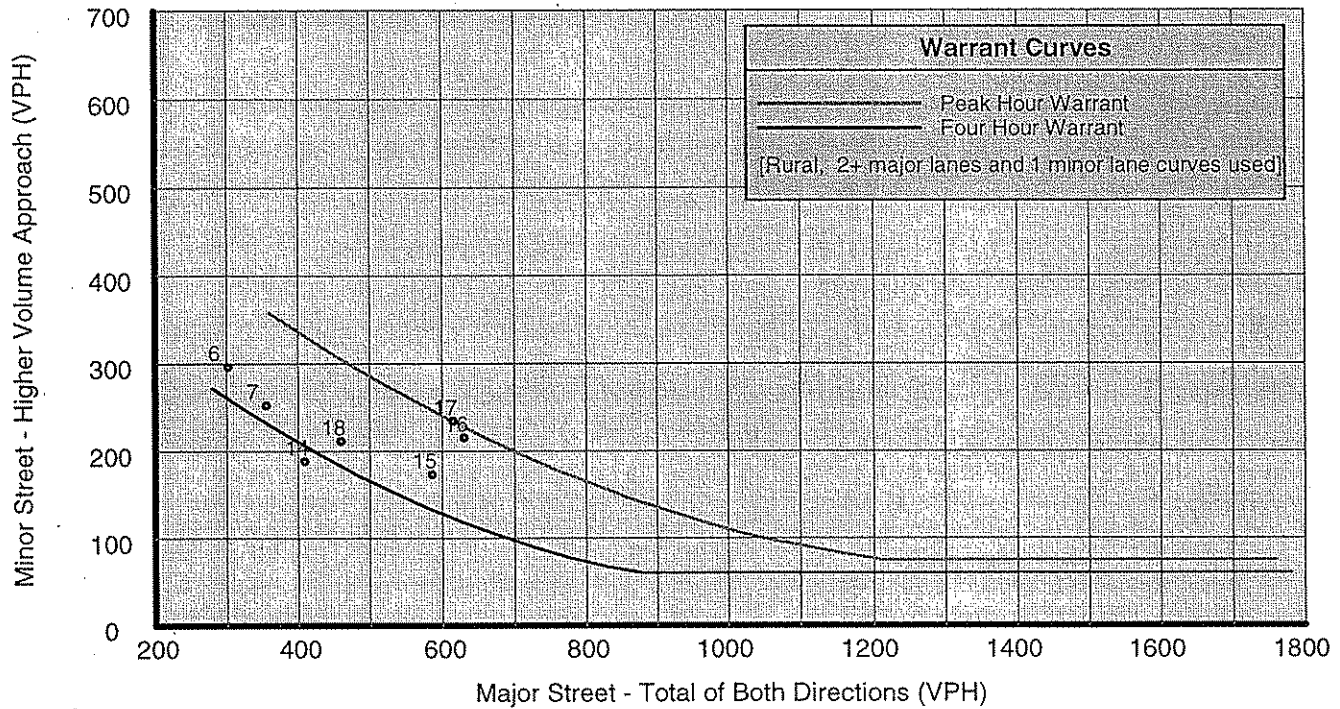
**Warrant 7 - Crash Experience** ..... Not Evaluated

**Warrant 8 - Roadway Network** ..... Not Evaluated

# ANOKA COUNTY HIGHWAY PC-WARRANTS TRAFFIC SIGNAL WARRANT ANALYSIS

Study Name : TMC0434  
Study Date : 12/06/04  
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	52-No	---	504-No	84-No	---
01:00	0	0	EB	420-No	105-No	---	630-No	52-No	---	504-No	84-No	---
02:00	0	0	EB	420-No	105-No	---	630-No	52-No	---	504-No	84-No	---
03:00	0	0	EB	420-No	105-No	---	630-No	52-No	---	504-No	84-No	---
04:00	0	0	EB	420-No	105-No	---	630-No	52-No	---	504-No	84-No	---
05:00	0	0	EB	420-No	105-No	---	630-No	52-No	---	504-No	84-No	---
06:00	302	296	EB	420-No	105-Yes	Minor	630-No	52-Yes	Minor	504-No	84-Yes	Minor
07:00	356	252	EB	420-No	105-Yes	Minor	630-No	52-Yes	Minor	504-No	84-Yes	Minor
08:00	117	99	EB	420-No	105-No	---	630-No	52-Yes	Minor	504-No	84-Yes	Minor
09:00	0	0	EB	420-No	105-No	---	630-No	52-No	---	504-No	84-No	---
10:00	0	0	EB	420-No	105-No	---	630-No	52-No	---	504-No	84-No	---
11:00	0	0	EB	420-No	105-No	---	630-No	52-No	---	504-No	84-No	---
12:00	0	0	EB	420-No	105-No	---	630-No	52-No	---	504-No	84-No	---
13:00	144	93	EB	420-No	105-No	---	630-No	52-Yes	Minor	504-No	84-Yes	Minor
14:00	409	188	EB	420-No	105-Yes	Minor	630-No	52-Yes	Minor	504-No	84-Yes	Minor
15:00	586	173	EB	420-Yes	105-Yes	Both	630-No	52-Yes	Minor	504-Yes	84-Yes	Both
16:00	630	215	EB	420-Yes	105-Yes	Both	630-Yes	52-Yes	Both	504-Yes	84-Yes	Both
17:00	615	234	EB	420-Yes	105-Yes	Both	630-No	52-Yes	Minor	504-Yes	84-Yes	Both
18:00	460	211	EB	420-Yes	105-Yes	Both	630-No	52-Yes	Minor	504-No	84-Yes	Minor
19:00	0	0	EB	420-No	105-No	---	630-No	52-No	---	504-No	84-No	---
20:00	0	0	EB	420-No	105-No	---	630-No	52-No	---	504-No	84-No	---
21:00	0	0	EB	420-No	105-No	---	630-No	52-No	---	504-No	84-No	---
22:00	0	0	EB	420-No	105-No	---	630-No	52-No	---	504-No	84-No	---
23:00	0	0	EB	420-No	105-No	---	630-No	52-No	---	504-No	84-No	---

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

Study Name : TMC0434  
 Study Date : 12/06/04

**Multi-Way Stop Warrant Report**

**Major Street Approaches**

**Northbound: TH 47**  
 Total Approach Volume: 2,724  
 Approach Speed: 50

**Southbound: TH 47**  
 Total Approach Volume: 895  
 Approach Speed: 50

**Minor Street Approaches**

**Eastbound: CR 81**  
 Total Approach Volume: 1,761

**Westbound: SCHOOL ENTRANCE**  
 Total Approach Volume: 301

**Warrant Summary**

**Criteria A - Interim Measure** ..... Not Evaluated  
 If traffic signals are justified, stop signs can be installed as an interim measure.

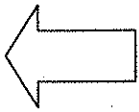
**Criteria B - Crash Experience** ..... Not Evaluated  
 Number of crashes (0) is less than the minimum required (5).

**Criteria C - Minimum Volumes and Delays** ..... Not Satisfied  
 Delay data not evaluated  
 Required volumes reached for 7 hours, 8 are needed.

**Criteria D - 80% of Volumes, Delays, and Crashes** ..... Not Evaluated  
 Delay data not evaluated  
 Required volumes reached for 0 hours, 8 are needed

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

Time	Major Crit		Crit C			Crit D		
	Total	Minor Total	Major Crit	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	302	303	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
07:00 - 08:00	356	287	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
08:00 - 09:00	117	103	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	144	96	210-No	140-No	No	240-No	160-No	No
14:00 - 15:00	409	266	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
15:00 - 16:00	586	260	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
16:00 - 17:00	630	271	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
17:00 - 18:00	615	255	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
18:00 - 19:00	460	221	210-Yes	140-Yes	Both	240-Yes	160-Yes	Both
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



**NORTH**

**COUNT LOCATION:**

TH 47 (Saint Francis Blvd.) @

**DATE:**

11/03/2004

CR 81/Saint Francis JHS Entrance

APP. #1 = TH 47

APP.#2 = School Entrance

APP. #3= TH 47

APP.#4 = CR 81

APP.  
#2

APP.  
#1

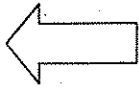
APP.  
#3

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	2				2	5		
6:30-6:45						5		
6:45-7:00	1				1	3		2
<b>HOURLY TOTAL</b>					<b>3</b>	<b>HOURLY TOTAL</b>		<b>16</b>
7:00-7:15	2				2	8		5
7:15-7:30	2				2	6		5
7:30-7:45						8		2
7:45-8:00	1				1	5		1
<b>HOURLY TOTAL</b>					<b>5</b>	<b>HOURLY TOTAL</b>		<b>40</b>
8:00-8:15						8		1
8:15-8:30	2				2	8		
<b>HOURLY TOTAL</b>					<b>2</b>	<b>HOURLY TOTAL</b>		<b>17</b>
				<b>TOTAL</b>	<b>10</b>		<b>TOTAL</b>	<b>73</b>

1:30-1:45						7		
1:45-2:00						6		2
<b>HOURLY TOTAL</b>						<b>HOURLY TOTAL</b>		<b>15</b>
2:00-2:15	1				1			4
2:15-2:30	17				17	3		2
2:30-2:45	6				6	5		3
2:45-3:00	1				1	4		
<b>HOURLY TOTAL</b>					<b>25</b>	<b>HOURLY TOTAL</b>		<b>21</b>
3:00-3:15	2				2	4		2
3:15-3:30						3		2
3:30-3:45	6				6	2		2
3:45-4:00	7				7	1		3
<b>HOURLY TOTAL</b>					<b>15</b>	<b>HOURLY TOTAL</b>		<b>19</b>
4:00-4:15	6				6	5		2
4:15-4:30						5		
4:30-4:45	5				5	2		
4:45-5:00	8				8	2		
<b>HOURLY TOTAL</b>					<b>19</b>	<b>HOURLY TOTAL</b>		<b>16</b>



**NORTH**

**COUNT LOCATION:**

TH 47 (Saint Francis Blvd.) @  
CR 81/Saint Francis JHS Entrance

**DATE:**

11/03/2004

APP. #1 = TH 47

APP.#2 = School Entrance

APP. #3= TH 47

APP.#4 = CR 81

APP.  
#2

APP.  
#1

APP.  
#3

APP.  
#4

- HEAVY VEHICLE- ANY VEHICLE HAVING MORE THAN FOUR TIRES TOUCHING THE PAVEMENT
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  - 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
5:00-5:15						4		
5:15-5:30	2				2	6		
5:30-5:45						1		
5:45-6:00						3		
<b>HOURLY TOTAL</b>					<b>2</b>	<b>HOURLY TOTAL</b>	<b>14</b>	
6:00-6:15	4				4	1		
6:15-6:30						1		
6:30-6:45						1		
6:45-7:00						3		
<b>HOURLY TOTAL</b>					<b>4</b>	<b>HOURLY TOTAL</b>	<b>6</b>	
					<b>TOTAL</b>	<b>65</b>	<b>TOTAL</b>	<b>91</b>