

**SCHOOL CROSSING ANALYSIS**  
**City of Madison**  
**Department of Transportation**  
**Traffic Engineering Division**

School Marquette Elementary School

Crossing Location Thornton Ave at the Jenifer St Ped/Bike bridge over the Yahara River

Elementary School Children Crossing Thornton Ave

					POINTS	
					a.m.	p.m.
<b>1) Number of elementary students crossing</b>	<u>number</u>	<u>points</u>	<u>number</u>	<u>points</u>		
a.m. peak hour (7:11 to 7:45) <u>54*</u>	0 - 19	0	50 - 74	20	20	24
	20 - 29	4	75 - 99	24		
	30 - 34	8	100-124	28		
p.m. peak hour (2:32 to 3:16) <u>88**</u>	35 - 39	12	125-149	32		
* also 41 middle school students	40 - 49	16	150+	36		
** also 66 middle school students						
<b>2) Gap Availability</b>					20	
crossing distance = <u>30</u> feet	<u>% safe</u>	<u>gap time</u>	<u>points</u>	<u>% safe</u>		
	80 +	0		45 - 49	20	
	70 - 79	4		40 - 44	24	
minimum safe crossing time = <u>10</u> seconds	60 - 69	8		30 - 39	28	
	55 - 59	12		20 - 29	32	
% safe crossing time = <u>49.9</u> % a.m. (7:11 - 7:45)	50 - 54	16		0 - 20	36	
<u>65.1</u> % p.m. (2:32 - 2:58)						8
<b>3) Motor Vehicle Speed</b>	<u>mph</u>	<u>points</u>	<u>mph</u>	<u>points</u>		
85th percentile speed = <u>est. 25</u> mph a.m.	0 - 25	0	36 - 40	6	0	2
	26 - 30	2	41 - 45	8		
<u>est. 30</u> mph p.m.	31 - 35	4	46 +	10		
<b>4) Sight Distance</b>			<u>design stopping distance</u>			
available sight distance: _____ feet _____ bound			<u>85th %ile speed</u>	<u>feet</u>		
			25 - 30 mph	200		
_____ feet _____ bound			31 - 35 mph	240		
[straight, flat alignment, not measured]			36 - 40 mph	275		
ratio: available sight distance / design stopping distance			41 - 45 mph	310		
			46 + mph	350		
			<u>ratio</u>	<u>points</u>		
_____ feet _____ bound			2.1 +	0	0	0
			1.5 - 2.0	1		
_____ feet _____ bound			1.0 - 1.5	5		
			< 1.0	15		
<b>5) Safety History - Previous Five Years</b>						
<b>a) Number of reported crashes at study location involving elementary school children going to or coming from school.</b>			<u>crashes</u>	<u>points</u>	0	0
			0	0		
<u>0</u> reported crashes			1	5		
			each add'l	20		
<b>b) Reported crashed not involving children going to or coming from school, but of types and/or at times that could conflict with school crossing at this location.</b>				<u>points</u>	0	0
<u>0</u> reported crashes. Type: _____				0 - 5		
_____ reported crashes. Type: _____				0 - 5		
_____ reported crashes. Type: _____				0 - 5		
<b>6) Other Factors</b>				<u>points</u>		
Foreign traffic route.				0 to +5		
For each approach in excess of four.				+5		
For complex signal or crossing design.				+5 to +10		
For simple signal or crossing design.				-5 to -10		
Safer crossing one block out of the way.				-10		
Large percentage of grades K and 1 students (over 40%).				0 to +5		
An intersection of two arterial streets where total weekday traffic approach volume exceeds 25,000 vehicles.				+4		
Children crossing multiple crosswalks at an intersection.				0 to +10		
Stopped buses and/or other obstructions.				0 to +5		
Volume of turning traffic not reflected in gap availability.				0 to +5		
<b>TOTAL HAZARD RATING</b>					40	34

## Interpretation of Hazard Rating

Using the hazard rating as a guide, the following measures are appropriate:

1. **Mark as a school crossing** when the hazard rating is greater than 20 points at a crossing used by at least 25 elementary school students during the peak crossing hour. The Traffic Engineer is authorized to mark such a crossing with appropriate warning signs and special crosswalk markings.
2. **Install flashing beacons** if any one of the following conditions is met:
  - a. The 85th percentile speed is in excess of 40 mph measured at existing school crossing signs which have been in place at least 30 days.
  - b. The street crossed is a U.S. or State Trunk Highway on which a significant percentage of "foreign " drivers can be expected.
  - c. The ratio of sight distance to safe stopping distance is less than 1.5.
  - d. The hazard rating is greater than 30 at an unguarded location where at least 25 elementary students cross and the available safe crossing gaps are less than 50 percent.
3. **Recommend the assignment of an adult school crossing guard** when the hazard rating is greater than 40 points at a crossing used by at least 25 elementary school students during the peak crossing hour.

If the school has only grades K through 2, recommend the assignment of an adult school crossing guard in the hazard rating is greater than 30 points at a crossing used by at least 15 elementary school students during the peak crossing hour.

4. **Recommend the discontinuance of adult school crossing guard protection** at a crossing where the hazard rating falls below 30 points or if the number of elementary school students crossing during the peak hour in less than 15.

At the intersection of two arterial streets where the total weekday entering traffic volume exceed 25,000 vehicles, the total number of students crossing at the intersection will be used to compare to the minimum of 15 students required to retain an adult school crossing guard.

### Remarks

#### Morning

Student Patrol arrived at 7:27, left at 7:41

Gap availability    7:11 - 7:20 was 79.4% when 2 elementary and 3 middle school students crossed  
                          7:20 - 7:35 was 49.8% when 20 elementary and 22 middle school students crossed  
                          7:35 - 7:45 was 23.3% when 32 elementary and 14 middle school students crossed  
                          7:45 - 7:55 was 73.0% when 0 elementary and 2 middle school students crossed

Crosswalk area would be less congested if parents dropping off on the west side of Thornton in front of O'Keeffe Middle School would pull forward towards Spaight St instead of dropping-off near Jenifer St.

#### Afternoon

Student Patrol arrived 2:34

Gap availability    2:12 - 2:32 was 85.3% when 1 elementary and 0 middle school students crossed  
                          2:32 - 2:58 was 65.1% when 79 elementary and 52 middle school students crossed  
                          2:58 - 3:16 was 69.3% when 8 elementary and 14 middle school students crossed

An additional 3 elementary school and 35 middle school students crossed Jenifer St. (stop sign controlled) an additional 9 middle school students on bikes on the street.

A lot less traffic and congestion in the afternoon than in the morning, but a bit higher speed.

### Recommendations

Recommend assignment of Adult School Crossing Guard. Location just meets the hazard rating level of 40 points in the morning with twice the minimum required number of elementary school aged students walking and using this crossing,

by Arthur Ross, Pedestrian-Bicycle Coordinator

Date 05/15/09