AGENDA

TOWN OF FLOWER MOUND TRANSPORTATION COMMISSION MEETING

07/12/2022

FLOWER MOUND TOWN HALL, 2121 CROSS TIMBERS ROAD
FLOWER MOUND, TEXAS

6:30 P.M.

****

An agenda information packet is available online at http://www.flower-mound.com/AgendaCenter

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Please silence or turn off all electronic devices in Jody Smith Hall

A. CALL REGULAR MEETING TO ORDER

B. PLEDGE OF ALLEGIANCE

C. PUBLIC COMMENT

To speak to the Commission during public comment, please fill out a comment form.

- Speakers are limited to 3 minutes, however this can be adjusted by the Chair
- Additional time limits will be provided to members of the public that need to address the Transportation Commission through a translator
- Please state your name and address when speaking

The purpose of this item is to allow the public an opportunity to address the Commission on issues that are not the subject on this agenda. Issues regarding daily operational or administrative matters should first be dealt with by calling Town Hall at 972-874-6000 during business hours.

D. TRAFFIC MANAGER REPORT

- Update status report related to operational issues, capital improvement projects, and TxDOT projects
- Commission re-application reminder
- Board and Commission banquet reminder
- Future Transportation Commission meeting dates
- Future agenda items

E. CONSENT ITEMS

This part of the agenda consists of non-controversial or "housekeeping" items required by law. Items may be removed from Consent by any Commissioner by making such request prior to a motion and vote.

1. Minutes 06/14- Consider approval of the minutes from a regular meeting of the Transportation Commission held on June 14, 2022.

F. WORK SESSION ITEMS

2. Providing information regarding adjustments to the School Crossing Guard sites for the 2022-2023 school year. Providing information regarding intent and coordination on school crossing guard information with the Transportation Commission going forward starting with the 2022-2023 school year.

G. ADJOURNMENT

I do hereby certify that the Notice of Meeting was posted on the bulletin board in Town Hall of the Town of Flower Mound, Texas, a place convenient and readily accessible to the general public at all times and said Notice was also posted on the Town's website in accordance with GC Section 551.056 on the following date and time: July 8, 2022 at 3.45 PM, at least 72 hours prior to the scheduled time of said meeting.

Namrata Katharotiya

Namrata Katharotiya, Administrative Secretary

The Flower Mound Town Hall and Jody Smith Hall are wheelchair accessible. Requests for accommodations or interpretive services must be made at least 48 hours prior to this meeting by contacting Namrata Katharotiya at 972-874-6436.

TRANSPORTATION COMMISSION AGENDA ITEM NO. 1

CONSENT ITEM

DATE: July 12, 2022

FROM: Namrata Katharotiya, Public Works Administrative Secretary

ITEM: **Consider approval of the minutes from the regular meeting of the Transportation Commission held on June 14, 2022.**

BACKGROUND INFORMATION: This agenda item is to consider approval of the minutes from the June 14, 2022 regular meeting of the Transportation Commission.

CITIZEN FEEDBACK: N/A

ALTERNATIVES/OPTIONS: N/A

FISCAL IMPACT: N/A

LEGAL REVIEW: N/A

ATTACHMENTS:

1. Draft minutes 06.14.22

DRAFT MOTION: Move to approve as presented in the agenda caption.

THE FLOWER MOUND TRANSPORTATION COMMISSION REGULAR MEETING HELD ON THE 14TH DAY OF JUNE 2022 IN THE FLOWER MOUND TOWN HALL, LOCATED AT 2121 CROSS TIMBERS ROAD, IN THE TOWN OF FLOWER MOUND, COUNTY OF DENTON, TEXAS AT 6:30 P.M.

The Transportation Commission met in regular session with the following members present:

Chris Reed	Chair
Cheryl Moore	Vice Chair
Ron Hogue	Commissioner, Place 3
Scott Jostes	Commissioner, Place 4
Charlie Landry	Commissioner, Place 7
Michelle Jackson	Commissioner, Place 8
Bjorn Vandug	Commissioner, Place 1

(Places 8 and 9 of the Commission do not vote on items unless they sit in place of one of the regular members; Places 1-7.)

Louis Viscusi	Commissioner, Place 9

With the following members of the Town staff participating:

Chuck Jennings	Director of Parks and Recreation
Matthew Hotelling	Sr. Engineering Transportation Manager
Namrata Katharotiya	Administrative Secretary

A. CALL TO ORDER - REGULAR SESSION – 6:30 P.M.

B. PLEDGE OF ALLEGIANCE

C. PUBLIC PARTICIPATION

None

D. TRAFFIC MANAGER REPORT

- Update status report related to operational issues, capital improvement projects, and TxDOT projects
- Commission re-application reminder
- Future Transportation Commission meeting dates
- Future agenda items

E. VICE CHAIR ELECTION

1. Commissioner Jackson nominated Commissioner Moore for Vice Chair. Commissioner Landry seconded the motion.

VOTE ON THE MOTION *Motion passed (6-0-0)*

AYES: Jackson, Hogue, Jostes, Landry, Moore, Vandug

NAYES: None

ABSTAIN: None

ABSENT: Viscusi

F. CONSENT ITEMS

2. Consider approval of minutes from the regular meeting of the Transportation Commission held on May 10, 2022.

Commissioner Vandug made a motion to approve consent Item 1 as presented in the agenda caption. Commissioner Landry seconded the motion.

VOTE ON THE MOTION *Motion passed (6-0-0)*

AYES: Jackson, Hogue, Jostes, Landry, Moore, Vandug

NAYES: None

ABSTAIN: None

ABSENT: Viscusi

G. REGULAR ITEMS

3. Public Hearing to consider a request to amend the Master Plan (MPA21-0010 - Parks and Trails Plan) by removing and replacing Section 5.0, “Parks and Trails Plan,” and adopting the 2022 Trails and Bikeways Master Plan, and to consider adopting an ordinance providing for said amendments.

Staff Presentation
Chuck Jennings, Director of Parks and Recreation
Lenny Hughes (Halff Associates)
Kailey Saver (Halff Associates)

Spoke In Favor:

None

Spoke In Opposition:

None

Commission Deliberation

Vice Chair Moore made a motion to recommend approval for consideration of Planning & Zoning Commission, Town Council, for amending the Master Plan (MPA21-0010 - Parks and Trails Plan) by removing and replacing Section 5.0, "Parks and Trails Plan," and adopting the 2022 Trails and Bikeways Master Plan, and to consider adopting an ordinance providing for said amendments. Commissioner Jostes seconded the motion.

VOTE ON THE MOTION *Motion passed (6-0-0)*

AYES: Jackson, Landry, Moore, Jostes, Hogue, Vandug

NAYES: None

ABSTAIN: None

ABSENT: Viscusi

H. ADJOURNMENT – 7.44 P.M.

TOWN OF FLOWER MOUND
TRANSPORTATION COMMISSION

_____
CHRIS REED, CHAIR

ATTEST:

_____
NAMRATA KATHAROTIYA, ADMINISTRATIVE SECRETARY

TRANSPORTATION COMMISSION AGENDA ITEM NO. 2

WORK SESSION ITEM

DATE: July 12, 2022

FROM: Steven Strickland, Lieutenant

ITEM: **Providing information regarding adjustments to the School Crossing Guard sites for the 2022-2023 school year. Providing information regarding intent and coordination on school crossing guard information with the Transportation Commission going forward starting with the 2022-2023 school year.**

BACKGROUND INFORMATION: This agenda item is to provide information and garner feedback regarding adjustments to School Crossing Guard sites for the 2022-2023 school year, as well intent and methods to share information regarding the School Crossing Guard Index (SCGI) evaluations and partnering with Traffic Engineering to have a consultant third-party conduct a study of school zones and crossing sites.

The Town of Flower utilizes the SCGI to evaluate the need for staffing of adult crossing guards at specific and logical sites. The SCGI was considered and recommended by the Transportation Commission in September 2011. An evaluation of the crossing guard sites, including pedestrian and vehicle counts was conducted in April of 2022. The data indicated several sites that do not meet the current School Crossing Guard Index criteria or could be adjusted to increase the safety of pedestrians.

Adjustments supported by the School Crossing Guard Index (SCGI) are being made to staffed crossing guard sites for the purpose of pedestrian safety and effective/efficient use of resources to include:

- Addition of up to 2 sites and 3 guards for Argyle South Elementary School
- Removal of staffing at St. Gallen/Wager Rd.
- Removal of staffing at Garden Ridge/St. Gallen
- Removal of staffing at Forest Vista/Lake Forest
- Removal of staffing at Spinks/Lexington
- Removal of staffing at College Pkwy mid-street/trail
- Removal of staffing at mid-street Matterhorn Lane/trail
- Removal of staffing at Timber Creek/Colony
- Removal of staffing at Timber Creel/Glen Hollow
- Re-assignment of staffing at Old Settler Elementary mid-street crossing
- Re-assignment of staffing at McKamy Middle School mid-street crossing

The Flower Mound Police Department will continue to conduct SCGI evaluations each semester of the school year to evaluate and prioritize the need for adult school crossing guard staffing at locations. The results of which will be shared with the Commission for feedback and notification of needed adjustments that may result, if any.

In 1997 a comprehensive study was conducted by a third-party firm of all school zones, traffic control measures, and crossing sites. The Police Department is seeking feedback on potentially partnering with Traffic Engineering to commission a similar study that will update previous data and incorporate new zones and crossings since that time.

FISCAL IMPACT: N/A

LEGAL REVIEW: N/A

ATTACHMENTS:

1. Excerpt from the September 2011 Transportation Commission Packet on SCGI

DRAFT RECOMMENDATIONS: The purpose of this agenda item is to provide information to the Transportation Commission and elicit feedback. No formal action is required.

TRANSPORTATION COMMISSION
AGENDA ITEM NO: 3
September 13, 2011

[ ] CONSENT ITEM **[X] REGULAR ITEM** **[ ] WORK SESSION ITEM**

FROM: Matthew J. Hotelling, P.E., Traffic Engineer

THROUGH: Kent Collins, P.E., Assistant Town Manager
Edith Marvin, P.E., Town Engineer
Tiffany Bruce, P.E., Engineering Manager

PRESENTER: Matthew J. Hotelling, P.E., Traffic Engineer

ITEM: **Consider recommending approval of the School Crossing Guard Index to assist in establishing the need for a school crossing guard location.**

[X] Recommendation **[ ] Motion** **[ ] Direction** **[ ] Information**

I. SUMMARY:

This is a regular item regarding the use of a School Crossing Guard Index (SCGI) to assist in establishing of a school crossing guard location. The SCGI uses various factors to help determine if a crossing guard is warranted at a particular location. The SCGI is one of the compiled lists of tasks sent to the Town Council Strategic Planning session during which direction was given to proceed with further discussion on this topic.

II. BACKGROUND INFORMATION:

During the January 2011 Transportation Commission (TRC) meeting, a discussion item was held regarding policy topics that the Transportation Commission would like to work on as part of their responsibilities. The TRC, as a result of that discussion, provided a list of recommended topics to the Town Council for consideration at their January Strategic Planning Session. As one of the responses, Town Council then gave direction for the TRC to provide feedback on the establishment of a school crossing guard location. Initial feedback from the TRC was provided at the May 2011 TRC Work Session.

During the May 2011 meeting the TRC was provided, by staff, the Institute of Transportation Engineers (ITE) article regarding school crossing guard criteria and an existing policy from one of our neighboring municipalities. As a result of the Work Session, the TRC requested that staff provide additional information on the following:

- Crash rate factor
- Physical handicap of pedestrians using the particular location
- Determine an appropriate threshold for SCGI index level

Staff has researched these considerations and the results are as follows:

Crash rate factor. After investigation into the number of accidents at our crossing guard locations, including accidents that occurred outside of school zone hours, the highest total accidents at one location over the last year and a half was six. This location was also the highest accident rate location overall with approximately 1 accident per million vehicle miles traveled. This particular location has also been under construction over the past year and a half. Most crossing guard locations have had one or no accidents within the last year and a half. Based on this information, it is not recommended to add a crash rate factor to the school crossing guard index.

Physical handicap of pedestrians using the particular location. After consultation with the Police Department, identifying physically handicapped individuals may be difficult as there are differing levels of disability. Generally, isolation of a single group of individuals out of a population is also not adviseable. However, the Police Department keeps in close contact with their crossing guards that work all of the various locations and requests input from them when necessary. Based on this information, it is not recommended to add a factor for physically handicapped pedestrians.

Determine an appropriate threshold for SCGI index level. Using the proposed basic equation (SCGI = ∑School Zone Traffic (SZT)/350 + ∑Pedestrian Count (PC)/40 + ∑Speed (S)/20 + ∑Number of Lanes Crossed (N)/2 + ∑Sight Distance Left (SD1)/200 + ∑Sight Distance Right (SD2)/200 + ∑Exposure factor (E)), the general threshold that can be reasonably met is 6.0. The value of 6.0 was derived at the typical values for each of the factors. A value of 6.0 or higher gives a good indication that the need for a crossing guard at a location exists. If the value is 6.0 or less, it would indicate that particular location would require further scrutiny to determine if the crossing guard is truly needed. The result of 6.0 is based on taking a typical location that is not directly adjacent to the school and applying typical data to each of the associated factors. To reiterate, the SCGI is a tool to assist in determining the need for crossing guards, but other factors influence the final decision to be made by the Police Department. Attachment 3 includes a brief description of each of the factors and an overview of how the screening tool would be used by the Police Department to aid in establishing the need for a school crossing guard location.

III. FISCAL IMPACT:

N/A

IV. LEGAL REVIEW:

N/A

V. ATTACHMENTS

1. ITE article regarding school crossing guards
2. SCGI policy from Carrollton
3. Description of proposed SCGI factors and overview

VI. RECOMMENDED MOTION OR ACTION:

Move to recommend approval to the Town Council of the School Crossing Guard Index to assist in establishing the need for a school crossing guard location.

Technical Note

Crossing Guard Analysis

BY JACK W. LOGGINS

The City of Arlington, Texas, has developed a hazard index to evaluate the need for adult crossing guards at school crossings and to enable such needs to be put in priority order. The hazard index also allows traffic control devices to be explored in an effort to reduce the hazard and as an alternative to placement of an adult crossing guard.

Background

In 1975, the City of Arlington decided that the city's Adult Crossing Guard Program would be administered through the Department of Transportation. The department was charged with determining where adult crossing guards should be assigned and with providing all training and supervision of the personnel involved. Before 1975, the program was administered by the Police Department.

The school crossing accident rate for the 5 years before the 1975 change amounted to over three children and guards hit per year; in comparison, there has only been one very minor accident in the 14 years since the changes have been implemented. This dramatic reduction in the number of accidents was achieved at the same time that the number of crossings increased approximately 50% and the city's population increased from 130,000 to 240,000.

The reduction in the school crossing accident rate for the City of Arlington can be attributed to two factors:

1. The decision on which school crossings are to have adult crossing guards is now determined after careful study and comparison of the safety problems at each location.
2. An on-going training and supervision program for crossing guards continually stresses that there must be an adequate gap in traffic or that approach vehicles must be stopped at the intersection before any children are allowed to cross.

Hazard indexes have been used successfully for years by engineers in various areas. The State of Texas uses a safety improvement index for determining where highway safety funds should be used. Savannah, Georgia, uses an index that considers age and number of children crossing to determine where crossing guards should be placed.

In 1975, the City of Arlington, using those indexes as models, formulated a study procedure for determining the optimum placement of adult crossing guards. The procedure was developed so that one location could be compared with another to ensure that safety problems would be properly considered before the decision was made on which locations would have adult crossing guards. The following hazard index was developed and used at that time:

$$\frac{N \times W \times K \times \text{TCD} \times \text{ADT}}{10^{10}} \quad (1)$$

Where

N = The number of children crossing per day.
W = The street width in feet.
K = The kinetic energy factor, determined by squaring the posted speed limit.
TCD = Traffic control device factor:
0.9 reduced speed school zone,
0.7 multiway stop sign,
0.6 traffic signal without pedestrian phase,
0.4 traffic signal with pedestrian phase.
ADT = Average daily traffic.

Recommended Hazard Index

As time progressed, it was found that more factors should be added to the crossing analysis. The expanded hazard index formula accounts for the traffic volume, street width, traffic speed, sight distance, stopping distance, and the number and age of the children:

$$(A \times W \times S^2 \times \text{VSD} \times \text{HSD} \times \text{SSD} \times \text{AF} \times \text{TCD})/10^{13} \quad (2)$$

Where

A = Average traffic per lane (over a 24-hour period).
W = Width of roadway, median to edge of road if median is equal to or greater than 40 ft.
S = Speed of traffic, 85th percentile in miles per hour.
VSD = Vertical sight distance needed divided by actual vertical sight distance (if less than 1.0, use 1.0).
HSD = Horizontal sight distance needed divided by actual horizontal sight distance (if less than 1.0, use 1.0).

SSD = Safe stopping distance at 85th percentile.
AF = Age factor (summation of age points) divided by number of students.
TCD = Traffic control device factor (for combinations, multiply values together):
0.9 crosswalk,
0.7 multiway Stop sign,
0.5 reduced speed school zone,
0.4 traffic signal without pedestrian phase,
0.2 traffic signal with pedestrian phase.

Traffic Volume

The traffic volume on the street being crossed is used in the formula and includes the right turns and left turns from any side street or driveway. The sum value is divided by the number of lanes, because, at a given point in time, a pedestrian is exposed not to the number of vehicles on the street, but rather to the number of vehicles per lane on that street. Also, because the index includes a factor for the width of the street, multiplying the width factor and the number of vehicles on the street would, in effect, be squaring the width of the street.

Roadway Width

The width factor is normally the actual width of the street being crossed (measured in feet). However, if a street has a median that is 40 ft wide or greater, the width of the street is considered to be only the distance from the median to the outside edge of the roadway. Visual observations of pedestrian movements revealed that medians of this size provided a safety refuge area that could very easily accommodate up to 40 pedestrians.

Speed

The speed factor is determined by squaring the 85th percentile speed (in mph), which is, in effect, a kinetic energy factor that eliminates the mass variable. This was the only speed factor used until recently. It was found, however, that adding speed factors of sight distance and safe stopping distance eliminated inequities in the hazard factors for the crossing guard locations and helped eliminate the large variance in the result.

Sight Distance

Vertical sight distance and horizontal sight distance factors were added to handle the situations in which the intersection sight values in the *Transportation and Traffic Engineering Handbook*[1] are not achievable. The horizontal and vertical sight distance factors are derived by dividing the required sight distance by the actual sight distance in each case. For example, a 35-mph speed zone would require a 350-ft sight distance (10 feet by 35 feet); if only 175 ft of sight distance was available, the factor would be 2.

Safe Stopping Distance

Safe stopping distance is calculated assuming a flat, wet asphalt pavement. The following formula is used for calculation of a safe stopping distance:

$$SSD = 1.47\,PV + (V \times 30F) \quad (3)$$

Where
P = perception reaction time (in seconds—assumed to be ¾ of a second).
V = speed from which a stop is made (in mph).
F = coefficient of friction (value).

Number and Age of Children

Originally, the number of pedestrians that cross during the morning and afternoon were added together and multiplied by the other factors. However, this method does not consider that kindergarten and first- and second-grade children are not capable of making the same decision as fifth or sixth graders. Thus, a system was developed in which seven age points were given for each kindergarten child, six age points for each first grader, and so forth up to the sixth grade. The index used in Savannah, Georgia, uses a similar method, in which points are assigned by groups. The number of students was multiplied by the age

point values. All of these age points were then added up and divided by the total number of students. This provides an age relationship factor that is used in the calculation.

Traffic Control Devices

Traffic control devices normally used near schools were assigned hazard reduction factors based on the hierarchy of these devices. The factors were selected by trial and error, comparing actual results with engineering judgment.

Results

Table 1, based on typical data and prepared with a computer spreadsheet program, gives examples of results of using the hazard factor formula. It is our belief that the hazard factor represents engineering judgment in the placement of crossing guards.

Policy

The City of Arlington uses the standard that if the hazard index is greater than 1.0 and the number of children crossing the intersection is 10 or more, an adult crossing guard may be needed at the location. In some cities, budgetary constraints may not allow placement of adult crossing guards at locations that have an index as low as 1.0. However, the index formula would still provide a basis for comparing one location with another to prioritize the allocation of available resources.

There has only been one minor accident in the 14 years since the program has been implemented.

The mayor and city council, school board, parent-teachers association, and citizens have been apprised of our methodology in selecting locations where crossing guards should be placed. Over the years, the methodology has proven very useful in successfully explaining how placement decisions are made so that the benefits of adult crossing guards are maximized.

A computer program has been developed that allows the traffic engineer to quickly analyze several locations at a time. In addition, the program is set up to print a summary of the locations and store the database. The program, written in BASIC for an IBM PC-AT, is available from the City of Arlington.

Reference

1. Institute of Transportation Engineers. *Transportation and Traffic Engineering Handbook*, 2d ed. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1982. ▮

Jack W. Loggins *is a graduate of the University of Texas at Arlington. He has worked for the City of Arlington, Texas, for the last 16 years as the assistant director of the Transportation Department. Prior to that time, he worked for the City of Lubbock, Texas. Loggins is a Member of ITE.*

Table 1. Results of Using Hypothetical Data with the Hazard Factor Formula

24-Hour Volume/Lane	Street Width (ft)	85 Percentile Speed (mph)	VSD HSD	SSD (ft)	No. of Children	Age Factor	TCD	Hazard Index
3,000	28	26	1	159.93	25	4.5	1.00	2.6563
1,500	44	31	1	205.45	25	3.0	0.70	2.1208
6,000	44	36	1	255.73	50	2.3	0.90	32.6010
4,500	36	26	2	159.93	100	5.0	0.63	28.6885
1,500	60	26	2	159.93	25	4.1	0.50	2.5931
1,000	60	26	2	159.93	100	6.3	0.90	19.1257
750	60	26	1	159.93	25	7.0	0.45	0.9961
1,500	60	26	1	159.93	25	3.9	0.50	1.2333
6,000	60	26	1	159.93	25	4.3	0.70	7.6149

Chapter Five: School Speed Zone Studies

Overview of a School Zone

Reduced speed limits may be desirable or necessary for school zones during the hours when children are going to and from school. Usually such school speed zones are only considered for schools located adjacent to highways or visible from highways.

Pedestrian crossing activity should be the primary basis for reduces school speed zones. Reduced speed limits should not be considered for locations where pedestrian crossing activity does not exist.

An engineering and traffic investigation should be conducted to determine the need for a reduced school speed limit as well as all appropriate traffic control devices to provide maximum safety.

School Crossing Guard Index Formula

The City of Carrollton provides school crossing guards at crossing locations that were created for elementary school aged pedestrians. However, the location must meet certain requirements to merit a crossing guard. The School Crossing Guard Index (SCGI) formula enables Staff along with the Traffic Advisory Committee to better determine which new locations should have a crossing guard as well as which existing locations should maintain a school crossing guard. The SCGI used the following factors to rank the intersections: Exposure factors (such as signalization, STOP signs and no control), pedestrian crossings, school zone traffic counts, 85th percentile speeds, number of travel lanes, and sight distance problems. In considering these variables, the need for a crossing guard is directly proportional to the numerical size of the variables: school zone traffic (SZT), pedestrian counts (PC), exposure factors (E), speed (S), and the number of travel lanes (N) and inversely proportional to: sight distance (SD).

BASIC EQUATION: $\sum SCGI = \sum SZT/350 + \sum PC/40 + \sum S/20 + \sum N/2 + \sum 175/SD1 + \sum 175/SD2 + \sum E$

SZT: used to represent thenumber of vehicles using the street in question, during the active hours that the school crossing guard is on location. It is given in vehicles per hour (VPH). The standard value of "SZT: is 350 vph.

PC: used to represent the number of children crossing at the location during an average school day. The standard value of "PC" is **40** with a minimum of **5**. The minimum criteria should be meet for both the AM and PM crossing times. A location with less than five children crossing should not be justified under any circumstances by this method. However, there is a new policy to cover when there are a minimum of 10 children crossing over the entire day. See Existing Policies. When 10 children are crossing over the entire day, i.e. 3 in the AM and 7 in the PM, this crossing guard is allowed to remain in place.

S: represents vehicular operating speed at the location. Since all crossing guard locations are located within 20 MPH school zones, 20 MPH was established as a standard value of "S".

N: represents the number of travel lanes at the locations. The number of lanes should range from two lanes to nine lanes. Two lanes are the average number of lanes that the pedestrian must cross to access the other side of the roadway. The number of lanes should be counted at the pedestrian crosswalk.

SD: represents sight distance at the location. A value of 175 feet was established for each of these variables. This value was established by considering a safe stopping distance for a design speed of 30 MPH on wet pavement. If visibility were unlimited, the effect of sight distance would be reduced to zero. Fore locations that have sight distance problems, the exact distance should be measured in order to input the value into the formula.

E: represents the exposure factors that are considered during the crossing activity. The exposure factors are as follows:

- Traffic signal with pedestrian indications (1 point)
- Traffic signal NO pedestrian indications (2 points)
- STOP signs, four way (2 points)
- STOP signs, two way (3 points)
- No control (4 points)

The minimum threshold number ranking for the SCGI is seven (7). Therefore, a location must have at least a ranking of seven to merit a crossing guard. In addition, the location must also have one of either of the following two conditions:

- At least 5 elementary aged children that cross at that location during **both** the morning and afternoon
- At least a cumulative of 10 elementary aged children that cross at that location during crossing times, i.e. 3 in the morning and 7 in the afternoon.

Proposed locations must meet the minimum threshold of 7.0 for the SCGI and the minimum of 5 elementary aged children crossing during **both** the morning and afternoon over a two (2) week period. The 10 cumulative children over a day period does NOT apply to proposed locations.

A location may fail to warrant a school crossing guard if one or more of the following traffic controls are existing:

1. Multi-way stop or traffic signals are in place. This type of control may provide a sufficient level of safety for the pedestrians if the number of pedestrians crossing is below a certain threshold.
2. Traffic volumes are shown to be low with few disruptions to the pedestrian's crossing.
3. A change in the established route to school would eliminate the need.
4. The crossing is located within one block or within 500 feet of a positive control device ore where another crossing guard crosses children.
5. Change in school boundary lines.
6. Change in the number of children that cross at the location.

Twice a year (September and April of the same school year), the crossing guards conduct pedestrian crossing counts at their assigned locations. This information is used to update the SCGI ranking system. The minimum threshold value and pedestrian counts for the two analysis periods are closely examined. If the location does not meet the minimum criteria during both the Fall and Spring semesters of the same school year, then the crossing guard should be removed. Crossing guards will not be removed during the middle of a school year.

The following are examples of meeting the minimum threshold value and minimum pedestrian crossing criteria:

- If a location has a calculated SCGI of 6.9 during the September analysis, then the location does not meet the minimum criteria. The location will be closely evaluated during the following April analysis. If the SCGI is again calculated below the minimum threshold value of seven, then Staff will recommend that the crossing guard be removed from the location.
- If during the September analysis, the average pedestrian count for a location is 4 in the AM and 4 in the PM, then the location does not meet the minimum pedestrian criteria. The location will be closely evaluated during the following April analysis. If the average pedestrian counts are below 5 for either the AM or PM crossing times or below 10 for the day, then Staff will recommend that the crossing guard be removed from the location.
- In both cases, the school zone would be recommended for removal if it were utilized only by an elementary school. If the school zone is adjacent to a school site, then the school zone should remain.

An example of the School Guard Index ranking table is included.

School Crossing Guard Index

SCGI Ranking				Average Pedestrian Volumes				SCGI	
				Fall 2005		Spring 2005			
Fall 2005	Spring 2005	Location	Cross Street	AM	PM	AM	PM	Fall 2005	Spring 2005
1	1	* Josey	at Branch Hollow	31.0	42.2	25.6	68.8	33.25	33.78
2	2	Frankford	at McCoy	6.4	9.8	8	18.4	27.62	27.88
3	3	@ Josey	at Fyke	1.8	7.0	0	8	26.25	26.23
4	5	# Rosemeade	at Cemetery Hill	9.6	13.2	3.2	6.2	21.61	21.27
5	4	* Keller Springs/Whitlock	at Denton	15.8	24.2	12	42.6	21.53	21.90
6	7	* Josey	at Pearl/Walnut Plaza	13.4	14.4	4.8	13.2	20.53	20.28
7	6	* Rosemeade	at Andrew	25.4	25.2	29	29	20.14	20.32
8	8	Rosemeade	at Furneaux	8.4	15.6	8	16.6	20.10	20.11
9	9	Denton	at Study	28.2	83.8	21	68.4	19.03	18.47
10	11	School	at Cox	33.8	48.6	31.4	42.2	17.01	16.79
11	12	Peters Colony	at Dorchester	69.4	86.6	57.4	102.8	16.67	16.77
12	10	Keller Springs	at Willowgate	5.2	9.2	8.2	16.2	16.59	16.84
13	13	Branch Hollow	at Rabbit Run	41.0	60.8	34.4	81.2	16.06	16.40
14	17	Cox	at Perry	35.0	49.6	23.4	43.2	15.93	15.48
15	15	Cemetery Hill	at Paxton	42.0	41.4	30.4	49	15.74	15.64
16	16	* Peters Colony	at Furneaux	91.4	75.8	67.2	94.6	15.69	15.56
17	18	Perry	at Pearl	24.6	33.0	13	24.2	15.33	14.82
18	14	Arbor Creek	at Lone Star	67.8	31.4	59.2	64.6	15.18	15.80
19	19	Spurwood	at Greenview	8.8	15.8	6.6	25.6	14.22	14.41
20	21	Arbor Creek	at Clearwater	32.4	22.0	26	18.8	14.21	13.97
21	20	Scott Mill	at Blanton Elem	27.4	72.2	34.6	106.4	13.35	14.39
22	23	Homestead	at Kimberly	24.0	21.4	19.4	26.4	13.26	13.27
23	22	Perry	at Pleasant Run	13.0	23.8	10	37	13.25	13.51
24	24	Rosemeade	at Cromwell	6.0	9.2	5.6	12.6	12.26	12.34

* - Location has 2 crossing guards; / - Location is currently in a major street construction zone; # Location did NOT meet Criteria Previous Semester; @ Does not meet this semester only; % Does NOT have a crossing guard

Figure 1

SCGI Ranking				Average Pedestrian Volumes				SCGI	
				Fall 2005		Spring 2005			
Fall 2005	Spring 2005	Location	Cross Street	AM	PM	AM	PM	Fall 2005	Spring 2005
25	25	McCoy	at Woodcrest	25.4	24.6	20	26.6	11.80	11.72
26	26	Scott Mill	at Thompson Elem	30.4	70.8	16.2	21.6	11.00	9.41
27	27	Willowgate	at Country Place Elem	29.0	58.2	20.6	48	9.60	9.14
28	28	Raleigh	at Rosemeade Elem	9.8	21.6	5.4	19.4	8.48	8.32
29	29	Guerrero	at Northmoor	12.8	14.6	18.8	32.6	7.38	7.98
30	0	% Spring	at Santa Rosa	8.4	14.4	8.4	14.4	6.57	6.57

* - Location has 2 crossing guards; / - Location is currently in a major street construction zone; # Location did NOT meet Criteria Previous Semester; @ Does not meet this semester only; % Does NOT have a crossing guard

Figure 1

SCHOOL CROSSING GUARD INDEX

Location: _____ At: _____

Variables for minimum warrant:

SZT = 350 vph
PC = 40 standard, 5 minimum
S = 20 mph
N = 2 lanes
SD = 175 ft./direction

Variables to be considered for School Crossing Guard Index (SCGI):

School zone traffic (SZT): _____(AM) _____ (PM)

Number of pedestrians that cross (PC): _____(AM) _____ (PM)

Vehicle operating speed (S): _____ (Major) _____(Minor)

Number of Lanes (N): _____ (Major) _____(Minor)

Sight distance 1: _____ (Major) _____ (Minor)

Sight distance 2: _____ (Major) _____ (Minor)

Exposure Factors (E):

_____ Traffic signal with pedestrian indicators (1)

_____ Traffic signal without pedestrian indicators (2)

_____ STOP signs, 4 way (2)

_____ STOP signs, 2 way (3)

_____ No control (4)

Check ALL factors and add total: _____ (Major) _____(Minor)

$$SCGI = \frac{\Sigma SZT}{350} + \frac{\Sigma PC}{40} + \frac{\Sigma S}{20} + \frac{\Sigma N}{2} + \frac{\Sigma 175}{SD1} + \frac{\Sigma 175}{SD2} + \Sigma E$$

Minimum SCGI: Elementary School = 7 **Minimum Pedestrians = 5**

Total SCGI = _____

School Crossing Guard Index Description and Overview

Overview of a School Zone

Reduced school zone speed limits may be desirable for school zones during the hours when elementary and middle school aged children are going to and from school. Reduced school zones should be primarily based on where pedestrian activity is present. Reduced school zones should not be considered where pedestrian activity does not exist.

The School Crossing Guard Index (SCGI) is proposed to be based on the following equation:

SCGI = ∑School Zone Traffic (SZT)/350 + ∑Pedestrian Count (PC)/40 + ∑Speed (S)/20 + ∑Number of Lanes Crossed (N)/2 + ∑Sight Distance Left (SD1)/200 + ∑Sight Distance Right (SD2)/200 + ∑Exposure factor (E)

The following is a brief description of each of the items in the basic equation:

SZT: School zone traffic is the number of vehicles using the street in question during the active school zone hours. The school zone traffic will be broken down to based on the type of school zone being evaluated. For instance, a school crossing location that handles both elementary and middle schools would have a separate SZT for the elementary portion and one for the middle school portion. The standard value for SZT is 350 vehicles per hour.

PC: Pedestrian Count is used to represent the number of children crossing at a location on an average school day. A minimum of 5 children should cross a given location during an average school day. Pedestrian counts are conducted every semester to verify the number of students crossing each location. The standard value is 40 persons.

S: Speed represents the speed of vehicular traffic at a crossing guard location. Since the typical crossing guard location is located within a reduced school speed zone, the standard value of 20 mph is used.

N: The number of lanes represents the number of lanes that a student must cross at any location. This includes lanes in both directions and turn lanes. For instance a location that has two lanes in each direction with one direction having a left turn lane, the value of N would be five. The standard value of N is two which represents a standard residential street.

SD: The sight distance is the available sight distance at a given location. SD1 is the sight distance as measured to the left and SD2 is the sight distance as measured to the