REPORT
2002 OCTOBER 7

CITY OF BURNABY

TRAFFIC AND TRANSPORTATION COMMITTEE
(TRAFFIC SAFETY DIVISION)

HIS WORSHIP, THE MAYOR
AND COUNCILLORS

SUBJECT: SCHOOL ZONE SPEED ABATEMENT PROJECT

RECOMMENDATIONS:

1. **THAT** Council approve the trial installation of pentagon road marking at three schools as illustrated in figure 1 of the attached report.

2. **THAT** copies of this report be forwarded to the Southwest District Community Policing Consultative Group and ICBC.

REPORT

The Traffic and Transportation Committee(Traffic Safety Division), at its open meeting held on 2002 October 1, received and adopted the *attached* report providing information regarding the Southwest District Community Policing Consultative Group's School Zone Abatement Project.

Arising from discussion, the Committee requested that Council approve the trial installation, at three schools, of a more modest version of pentagon road marking than that proposed by the Southwest District Community Policing Consultative Group.

Respectfully submitted,

Councillor D. Evans
Chair

Councillor B. Der
Vice Chair

Councillor G. Begin
Member

COPY: - DIR. ENGINEERING
- DIR. PLNG. & BLDG.

City of Burnaby

INTER-OFFICE COMMUNICATION

TO: TRAFFIC SAFETY COMMITTEE **DATE:** 2002 09 24

FROM: ASST. DIRECTOR ENGINEERING, TRAFFIC & ENGINEERING SYSTEMS **FILE:** 55-01-01

SUBJECT: **SCHOOL ZONE SPEED ABATEMENT PROJECT**

PURPOSE: To provide the Committee with information concerning the School Zone Speed Abatement Project.

RECOMMENDATION:

1. **THAT** a copy of this report be sent to the Southwest District Community Policing Consultative Group and ICBC.

REPORT

1.0 INTRODUCTION

At the 2002 June 4 meeting of the Traffic Safety Committee, the Southwest District Community Policing Consultative Group appeared as a delegation to discuss its proposed School Zone Speed Abatement Project. They requested that the three components of this project: the 'super graphic' road marking and rumble grooves at the beginning of the school zone and the 'School Zone End' signs be implemented at school zones on Rumble Street and Nelson Avenue in order to evaluate their impact on vehicle speeds. The proposal was referred to staff for report.

2.0 BACKGROUND

The City's signing and road marking generally conform to the "Manual of Uniform Traffic Control Devices for Canada" which is published by the Transportation Association of Canada (TAC). TAC is the agency which also promulgates wider road design standards (eg. "Geometric Design Guide for Canadian Roads") as well as specific application guidelines such as the "Pedestrian Crossing Control Manual" which is echoed by the BC Government's manual. Signs and markings are also required to conform with the BC Motor Vehicle Act and Regulations which, for example, defines the regulatory meaning of school zone signs specifying colour, shape, graphics standard size.

While the City must ensure conformity with guidelines and regulations, it has deviated in the letter in school areas in order to address the community's concern for safety. For example, the school zone pentagons and critical warning signs are oversized relative to standard dimensions having a base width of 750mm rather than 600mm. This increases the surface area of the signs by almost 60%.

The City has also deployed a unique school zone ahead sign (pentagon with arrow). This was done to take early advantage of the development of strong yellow/green fluorescent sheeting. (Until recently the school zone pentagon was specified as having a blue background in the BC Motor Vehicle Act Regulations).

At school crossings the City uses the advance warning "X" road marking and zebra stripes. These are permitted optional markings (the more general standard is twin parallel lines) in the Pedestrian Crossing Control Manual.

In addition, the City has a program for rotating a number of educational billboard style signs amongst different schools. These are augmented by a variety of smaller sign messages promoted by ICBC in concert with schools and parents' groups.

3.0 REVIEW OF PROPOSALS

3.1 School Zone Pentagon Pavement Marking

The "Project Kid Zone" proposal features a super graphic representation of the school zone pentagon as a pavement marking. While the photomontage presented by the delegation does not include dimensions of the sign, it would appear to cover most of the driving surface of a traffic lane, extending 6 to 8 feet in width. For representational accuracy from a distance it would need to be exaggerated in height longitudinally. The"X" marking in advance of the school crosswalks is exaggerated by a factor of 3. If this factor were applied to the pentagon sign would extend about

20 feet along the travel lane. The logistics of applying such a large road marking are daunting. Care would need to be taken in the choice of materials to ensure that skidding was not an issue. The road graphic could be reduced in size and less exaggerated in its elongation to mitigate these concerns (as shown in Figure 1, **attached**). In addition, the application could be monochromatic (ie. white border, silhouettes) to better conform with existing road marking materials.

If the road marking were to become a City standard then the program costs would not be inconsiderable. Standard road marking paint would provide the least expensive means of effecting the graphic, with an estimated cost per location of $150. However, it is anticipated that re-application would be required on an annual basis to ensure adequate legibility.

The second option would be to use a pre-manufactured "torch-on" decal. While the durability of this material is significantly greater than traditional road marking paint, the $250.00 cost per unit is substantially higher. Nonetheless it is, perhaps optimistically, anticipated that re-application would only be required every 5 years.

The table below provides a comparison of costs for initial installation, and costs projected over a 10 year time frame. It should be noted that the cost reflect the placement of pavement markings only at the school zones locations where 30 km/h speed restrictions are in effect.

	School Pentagon Road Marking Program		
	Initial Cost	**Projected Costs**	
		5 Year	**10 Year**
Pavement Marking Paint	$33,000	$165,000	$330,000
Torch On Marking	$55,000	$110,000	$222,000

3.2 Rumble Strips

The delegation also suggested that the auditory and tactile feedback generated by rumble strips would provide a distinct notification to motorists of the start of a 30 km/h school zone.

The City has some experience with a variety of rumble strip designs which are superimposed on the pavement. The delegation proposed "rumble grooves" that would be ground into the pavement. In prior discussion we had noted that snow plowing of raised markers created maintenance problems. While "rumble grooves" might be less likely to trip a snow plow they may result in more expensive maintenance by damaging pavement integrity.

Our expectation is that the rumble grooves would perform similarly to other types of transverse raised rumble strips. Motorists attention would be alerted by vibratory feedback, primarily through the steering wheel as well as the rumble signal. In principal, this is an attractive supplement to signing and marking but the noise is invariably found intrusive by nearby neighbours.

Unfortunately, the times when school is not in session and reduced speed zone is not in effect, the rumble strips/grooves would continue to provide notification to motorists and annoyance to neighbours. Over time, this continual operation could result in a diluted impact during times when the reduced speeds are required. We also note that the tactile feedback of rumble strips can be attenuated by driving at higher speeds.

Initial estimates suggest that "rumble grooves" could be installed at the start of each school zone with a reduced speed limit at a total cost of $300 - $500 per location depending on design. The lower estimate would provide two shallow 6" grooves approximately 6" apart across the travel lane at the start of the school zone. Accordingly, a program providing rumble strips at the beginning of each school zone would cost $70,000 - $120,000. Maintenance costs are unknown. It should be noted that costs associated with the removal of rumble grooves that prove too disruptive to neighbouring residents would be significantly higher.

3.3 School Zone Ends Signs

The Motor Vehicle Act regulations states "the back of the (pentagon school zone) sign assembly erected for the opposite direction of travel designates the end of the restricted zone". While it would be fair to assume that motorists are uncertain about how the end of a reduced speed limit zone is defined, those motorists who do obey the posted 30 km/h speed limit can and do apply reasonable judgement when determining the location to resume speed.

While the addition of this information sign might serve to clearly define the end of a reduced speed limit zone, staff are not convinced that this additional signage would have a significant impact on the level of driver compliance with 30 km/h speed limit adjacent to the school site. Care would have to be taken to ensure congruence between the end of the zone as defined by signing and the Motor Vehicle Act.

The total cost of installing these informational signs would be approximately $24,000 with annual maintenance estimated at 10% of the total.

4.0 DISCUSSION

The stated focus of the "Project Kid Zone" proposals is the lack of compliance with the reduced speed limits in school zones. While the data presented by the delegation confirms that over 50% of vehicles exceed the reduced speed limit the bulk of those are within the 30-40 km/h range. Police enforcement is typically targeted at the top 15% of speeders. At Nelson School the 85th percentile speed appears to be about 47 km/h. More remarkably at Suncrest School the 85th percentile speed is less than 40 km/h. While the parents and speed watch volunteers may view the statistics they have gathered with some dismay, they are in fact a testament to the significant progress they have made in changing driver attitudes in the school zones.

The delegation further observed that "school speed zone signs are often obstructed or covered due to vehicle parking and or tree growth (seasonal)". Any instances of obstruction should be reported to the Engineering Department for remedy. The delegation hypothesized that "school speed signs are in the driver's peripheral vision and do not always register as a Command Decision Image". However, the driving task requires that information content of signs and markings be absorbed well in advance of the point where road side signs are peripheral. The counter to this observation is that motorists can miss a sign if they are distracted by non-driving tasks. This is unfortunately true but the redundancy of the advance warning school zone sign should in most instances suffice to alert the inattentive driver who has no prior knowledge of the school zone. However, most drivers passing through a particular school zone have probably done so before and their disregard is habitual.

5.0 CONCLUSION

The June 4 delegation provided a thoughtful presentation to the Committee but the proposals raised some concerns. First is the challenge to our adherence to standardization of road marking and signing. To provide motorists with a common expectation of what signs mean standards need to be national if not wholly international. That being said, the City has introduced signs and devices on a trial basis to determine their merit. Often, however, it can be difficult to judge the merit of a new device because the novelty alone can alter behaviour. After the novelty subsides and motorists are habituated, we may find that we have only added background "noise" to the driving task.

In summary, as most school zones are in residential areas we do not recommend the introduction of rumble strips at the start of school zones. The proposal for signing the end of the school zone may provide clarification for some motorists but it would add little to safety in school zones and might cloud the overall understanding for many. Any such change should be introduced through the Motor Vehicle Act.

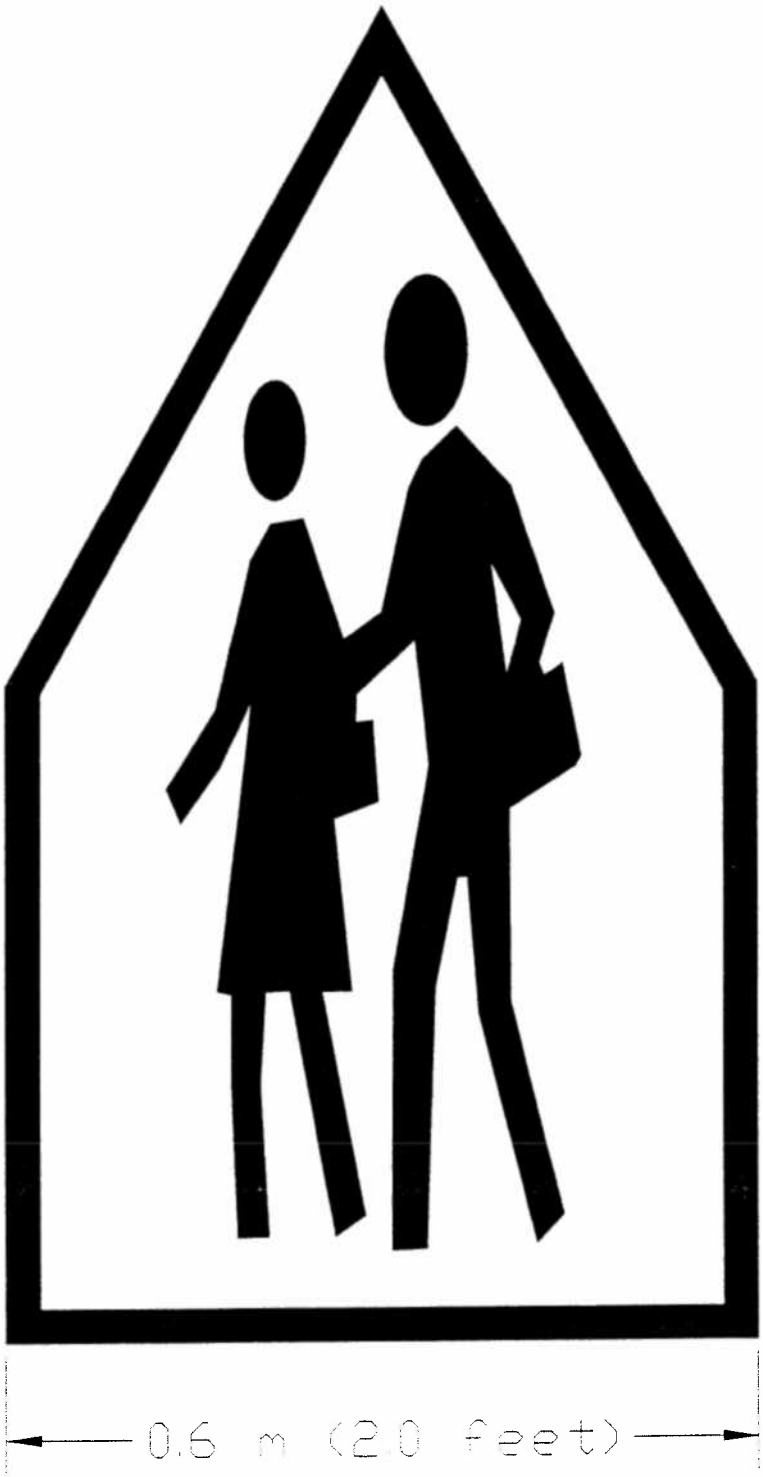
The large super graphic road marking of a school pentagon is not considered feasible at this time but a more modest version could be considered. We propose deployment of two signs for evaluation by the delegation and a third for separate trial.

It is recommended that a copy of this report be sent to ICBC as well as the delegation for comment.

P. Liivamagi, P. Eng.
ASST. DIRECTOR ENGINEERING,
TRAFFIC & ENG. SYSTEMS

AE/PL:
Attach.

cc: City Manager



City of Burnaby
ENGINEERING DEPARTMENT

Proposed School Zone
Road Marking

DRAWN BY: A.K.E	SCALE: N.T.S.
APPRV'D BY: P.L.	DATE: 02/09/24

A FIGURE 1