Initiatives at Supervised Crossings – Factoring in Risk

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ABSTRACT

Queensland Transport is continuously attempting to improve the safety of all road users. This paper is about two recent initiatives implemented at supervised school crossings throughout Queensland. The introduction of a new crossing warrant that incorporates a risk assessment formula is one initiative. The other initiative is the introduction of high visibility safety vests in conjunction with the new Australian Standard AS/NZS 4602.1999.

INTRODUCTION

Traffic control in school areas is a highly sensitive subject. Traffic conditions near schools can seriously affect the safety of school children. Although most school zones have a 40 km/h limit when children are present, these limits alone do not ensure the safety of the children. Queensland Transport has to support schools in managing traffic in the school environment through a range of interventions including traffic lights, signals, signs and markings around schools (Hillman, 1993).

Further to this, the traffic environment around schools is one of the most complex road transport environments normally encountered by motorists, and the most complex traffic environment encountered by children. This is because traffic density and pedestrian movements are concentrated in short periods of usually 30 minutes in the morning and 15 minutes in the afternoon (Hillman, 1990).

As a high proportion of school children are exposed to road safety dangers in their travel to and from school, they are particularly at risk when they are pedestrians. This is when they are either being dropped off or picked up by their parents or carers at school, or walking to and from school (DETR National Travel Survey 1999).

Drivers need to recognise that children are impulsive, unpredictable and inexperienced, and that caution should be exercised in the vicinity of a school. Queensland Transport recognises that there are many dangers to children in the road environment, and in some cases human intervention (School Crossing Supervisor) is necessary (Sissons, 1995).

INITIATIVES

To determine best practice in terms of crossing warrants[1], research was undertaken against a number of warrant models. Those from New South Wales, the UK and Florida, USA were evaluated and all were found to contain a risk related criteria. Previously, eligibility for a supervised crossing in Queensland was determined against criteria not related to risk. In Queensland the main criteria used were a minimum enrolment of 100 students at the school and a minimum of 50 children per day (25 in the morning and 25 in the afternoon) using the crossing each school day.

A new risk formula has now been incorporated as one of the criteria contained in the crossing warrant. This has allowed road safety staff to assign a Risk Assessment Factor (RAF) score to every primary and special school in Queensland. Under the new crossing management scheme schools will then be ranked in order of priority once the risk has been calculated. Ultimately this score will be used to determine whether the site warrants crossing supervision, or other types of intervention. The new warrant is part of a total crossing management system, and site selection has become less subjective.

As part of the Supervised Crossing Review, research was also undertaken to determine the most suitable colours and style of high visibility vests for people working in a road environment. Interestingly, the research revealed that Australian and New Zealand Standards are already amongst the highest in the world. The following photograph is from Taiwan.

[1] The warrant assesses whether a school crossing supervisor be appointed at a school on the basis of meeting certain criteria.

The original caption was about homemakers becoming crossing supervisors. Yes, it is an oven mitt!

QT utilised information from a Queensland Police report that showed the results from road trials conducted on a wide range of fluoro materials. As a result new high visibility vests have now been manufactured and distributed to every supervisor in Queensland.

This paper will discuss the methods and implementation of both initiatives.

INCORPORATING RISK TO DETERMINE ELIGIBILITY

Since the current School Crossing warrant was first introduced in Queensland the criteria used to assess whether a School Crossing Supervisor be appointed at a school have become less relevant. The increase in traffic volumes and other localised hazards suggest that in recent years the risk around schools has greatly increased.

Queensland Transport's road safety staff had often raised concerns regarding the lack of a risk assessment contained in the current warrant. Elements have been incorporated into a risk assessment formula to determine a school's suitability for participating in the School Crossing Supervisor Scheme. The crossing warrant presently revolves around the number of unaccompanied children rather than the "real risk" in terms of location, traffic flow, visibility and number of children crossing.

This has led to a situation where schools that have a low risk environment may be supervised and schools that were once excluded (for reasons not related to risk) are not supervised.

The new Risk Assessment Factor (RAF) formula takes into account the number of children and the most common problems in school zones which are traffic volume, excessive vehicle speed and visibility (road design) in areas where students must cross roads and where they are dropped off and picked up.

The formula was developed using a number of interstate and overseas models. To test the formula, each region was asked to conduct counts at a sample of participating schools to determine the of the number of children, the number of vehicles traversing the crossing and any fixed hazards obstructing a pedestrians view.

The Risk Assessment Factor is calculated using the following:

RAF = pc x **v** x **(as** x **c** x **i** x **g) divided by 100.**

Risk Factor Components

pc primary & infant children who cross road within 50m of formal crossing before and after school (times to be determined)
v vehicles traversing crossing per hour

Hazard Index Components

as signed approach speed
c fixed obstruction
i proximity to intersection/corner etc
g gradient of road

N.B. Heavy vehicles will have the value of two light vehicles.

A hazard index was developed and weightings were assigned to each of the factors (see attachment 1). The Risk Assessment Factor was then calculated, and the school categorized into one of three groups, high risk, medium risk or low risk.

Although the sample provided did allow some tentative thresholds to be set, it became essential that all schools that were currently participating in the Scheme be assessed against the new warrant, to fine-tune the groupings.

Since the inclusion of the new formula the Scheme has become more manageable in terms of objectivity. The formula has also allowed road safety staff to prioritise crossings within their budgets.

HIGH VISIBILITY SAFETY VESTS

As part of Queensland Transport's commitment to provide a safe and healthy road environment for road workers, it has been necessary to review the personal and protective safety equipment used by QT personnel, operating in the road environment. As a result of this review it was found that the uniform worn by supervisors did not meet Australian Standard AS/NZS 4602.1999.

The Workplace Health and Safety Act 1995 places an obligation on employers to ensure the health and safety of their employees at work. Employers also have an obligation to ensure that the health and safety of others is not detrimentally affected by the way an employer conducts their business.

A risk assessment of the work tasks required of school crossing supervisors has identified a range of risk factors that need to be addressed. The safety of the crossing supervisors, the safety of the users and the motoring public are all important components of the operation of the school crossing.

According to a survey of crossing supervisors, the number of incidents involving cars not stopping at children's crossings (drive throughs) had increased over the years. Although statistics supported this, it was still the case that crossing supervisors were asked to pay particular attention to drive throughs. The supervisors also believed that the visibility of the current crossing uniform in conjunction with the growth in traffic was a contributing factor to this increase.

As the original survey/trial was limited to urban areas, there was no trial data available to support the vest being introduced universally. In actual fact, the Australian Standard indicated that the new proposed high visibility safety vest (predominantly yellow) might not suit rural conditions.

The new Australian Standard 4602: 1999 (B3.3)

The colour of daytime use personal safety equipment should be selected for best contrast with the prevailing background in the work area, for example, yellow material may stand out better in urban areas whereas red or orange may stand out better in rural situations.

The Queensland Police Service had conducted extensive trials in conjunction with the Australian Standards Bureau to determine the most suitable colour for high visibility vests. A series of tests were carried out for the lemon/yellow and orange/red colours specified by the Australian Standard. A practical test schedule was designed to reflect a fair evaluation of what situations a reflective safety vest might be used under.

Testing was scheduled to take place in the daytime, at night and at dusk. Sites were selected for major streets, suburban streets, busy areas (shopping centres) and large green vegetated areas.

Further to this, other backgrounds selected included sky, green vegetation, red earth, roadway and buildings. A digital video was used to film all tests. The video camera was calibrated to simulate eye movement and sensitivity.
There were three areas in which the reflective safety vests had to perform, that was:

- to be recognised or when they became visible to the motorist (police drivers);
- to be distinguished as a road worker from the background; and
- to be identified as a police officer.

Tests indicated that there was no clear winner against the three requirements. It was determined that a compromise between the two different colours was needed.

As a result of the trial it was found that the lemon/yellow reflective safety vest in all instances was the first coloured reflective safety vest to be noticed.

However, in the police identification test, the orange/red safety vest out performed the lemon/yellow vest. The police drivers more readily identified the person as a police officer when the red/orange high visibility vest was worn.

When interpreting the police data it was necessary to consider the following:

- It may be the case that in determining the best high visibility vests for crossing supervisors that the identification of the person as a crossing supervisor is not of paramount importance.
- Crossing supervisors have the added advantage of working in locations that are supported by both fixed and temporary signage.
- If we consider that under test conditions the police isolated lemon/yellow as the colour first noticed by motorists (police drivers) it is appropriate that this colour combination should be considered above the other combinations.

As a result of the testing the new high visibility vests went into production after an extensive tendering process. Over 1800 high visibility vests have now been released to every crossing supervisor in the state.

Courtesy of The Courier Mail: Thursday August 22, 2002.

References

Australian/New Zealand Standard 4602:1999 High Visibility Safety Garments

Australian/New Zealand Standard 1906.4:1997 Retroreflective Materials and Devices for Road Traffic Control Purposes – Part 4:High Visibility Materials for Safety Garments

DETR Analysis of School Travel from National Travel Survey, September 1999

Hillman, M et al (1990) One false move…A study of Children's independent mobility, PSI Publishing, London

Hillman, M (1993) Children, Transport and the Quality of Life, PSI Publishing, London

Queensland Police Service Health Safety & Industrial Relations Branch Report into Reflective Safety Vests 2001.

Sissons Joshi (M) and MacLean (M), 1995 Parental attitudes to children's journey to school in World Transport Policy and Practice, Vol.1, No.4, 1995, pp.29-36

Attachment 1

Regions are requested to provide information on each school assessed according to the following tables. Each region is asked to provide information on as many schools as possible (target is 100 per region) by 21st September 2001.

School Counts and Risk Assessment (Please insert figures as appropriate using data collected and table below)

School	Signed Approach Speed (refer to table for score)	Fixed obstruction to visibility	Intersection/ Corner (refer to table for score)	Gradient (refer to table for score)	No. of children crossing (PC)	No. of vehicles (V)

Components of the Hazard Index

Signed Approach Speed within 500m of Xing 0 - 40	**Signed Approach Speed to Crossing 41-60 km**	**Signed Approach Speed to Crossing 61-80 km**	**Signed Approach Speed to Crossing 81-100 km**	**Fixed Obstruction to visibility (eg Crest, trees)**	**Intersectn /Corner 30m<**	**Intersectn /Corner 50m<**	**Gradient 5%**	**Gradient 10%**	**Gradient 15%**
1	1.1	1.3	1.5	1.1	1.2	1.1	1.1	1.2	1.3

Considerations in school counts and risk assessment.

Trucks and buses are counted as 2 vehicles.
Students with special needs are to be counted as 1.5 students
Contact your local council for **Gradient** of road.

It may be necessary to supply an explanation of the hazards at each school.

NB: Thresholds wil be established once all data is received. Values for the hazard index may change to address equity issues across regions.

PLEASE RETURN COMPLETED TABLES AS SOON AS POSSIBLE TO MARGARET MAY (FAX 3253 4211) OR EMAIL margaret.a.may@transport.qld.gov.au