

ROAD SAFETY EDUCATION IN SCHOOLS

Prepared by: John Catchpole, ARRB Transport Research Ltd

Gayle Di Pietro, GDP Consultancy

30 June 2003

1. BRIEF STATEMENT OF THE ISSUE

Most Australasian jurisdictions remain committed to school-based road safety education (RSE) programs in both the primary and secondary sectors. Despite the absence of outcome evaluations demonstrating that these programs are responsible for reductions in road trauma, they continue to occupy substantial amounts of valuable curriculum time, and new programs continue to be developed.

This section briefly reviews what is known from past research about the program attributes that maximise the chances of a school RSE program reducing involvement in traffic accidents for its target audience, both while they are still at school and later in life. It also offers some criteria that can be used to assess the road safety content and the educational delivery processes of current RSE programs and those planned or under development.

2. ASSESSMENT OF THE ROAD SAFETY ISSUE

Table 1 shows the number of school-aged children killed in traffic accidents in Australia in 2001 as a proportion of all fatalities. The percentage of fatalities aged five to 16 years is highest for pedal cyclists, followed by passengers and pedestrians. The situation is similar in New Zealand, where 30 per cent of cyclists killed, 17 per cent of pedestrians killed and seven per cent of passengers killed in 2001 were aged five to 14 years (LTSA, 2003).¹ These three road-user groups are the focus of RSE programs at primary school level. They receive reduced coverage at secondary level, where driver-related issues become more prominent.

Table 1: Fatalities of school-aged children in Australia, 2001, by sex and road user group

Types of road user	Gender	5-16 years	All ages	Percentage (5-16 years)
Drivers, motorcyclists and pillion passengers	Males	11	589	1.9 per cent
	Females	3	187	1.6 per cent
	Total	14	776	1.8 per cent
Passengers	Males	28	225	12.4 per cent
	Females	20	181	11.0 per cent
	Total	48	407	11.8 per cent
Pedestrians	Males	21	201	10.4 per cent
	Females	8	88	9.1 per cent
	Total	29	289	10.0 per cent
Pedal cyclists	Males	12	40	30.0 per cent
	Females	0	6	0.0 per cent
	Total	12	46	26.1 per cent
TOTAL	Males	72	1,265	5.7 per cent
	Females	32	470	6.8 per cent
	Total	104	1,736	6.0 per cent

Source: adapted from Australian Transport Safety Bureau fatality data for 2001.²

3. REVIEW OF THE RESEARCH LITERATURE

3.1. Effectiveness of school road safety education programs

There has traditionally been a view in road safety education that children aged less than about nine years or so have not reached a stage of psychological development at which they are capable of learning to be safe pedestrians. However, recent work has demonstrated that children as young as six years, and possibly younger, can be trained to cross roads more safely.³ It is important that training for young children be practical, and be carried out at the roadside or a close approximation of it.⁴ Young children's learning proceeds from the concrete to the abstract, and they tend not to transfer learning from the classroom to the real world.⁵

Bicycle education for primary school children is often successful in improving riding knowledge and riding performance.⁶ However, a study of the road safety outcomes of Victoria's *Bike Ed* program by Carlin et al.⁷ found that program participation appeared to *increase* the chance of the child presenting at hospital with a bicycle-related injury. On the other hand, a UK study⁸ found that children who received bicycle training were three times less likely to become casualties than those who did not. In view of the conflicting evidence, the value of bicycle education as an injury countermeasure remains unproven.

Programs to teach primary school children how to use public transport safely operate in Victoria, the ACT and Perth. The Victorian program is very highly regarded by primary school teachers.⁹ However, no evaluation of the road safety benefits of these programs has been performed.

Pre-driver education programs operate at or around Year 10 level in schools in several Australasian jurisdictions, including the ACT *Road Ready* program, Tasmania's *Pre-driver Education*, Victoria's *Keys Please* seminars and several local programs in New Zealand. *Road Ready* and *Keys Please* have been very favourably received by participants.^{10,11} Two evaluations have been undertaken to examine the impact of Tasmania's *Pre-driver Education* on accident involvement.¹² The first of these found students who took the full course were less likely than those who took no school pre-driver education to be involved in a crash in the first year after acquiring a licence. However, the second evaluation, using a larger sample of students, failed to confirm the benefit of the program.

The Victorian and ACT Year 10 programs have the specific aim of increasing the amount of driving practice that learners accumulate before they graduate to a solo licence; as such, they are likely to encourage many students to acquire the learner permit earlier than they otherwise would have. A recent Swedish finding suggests that earlier acquisition of the learner permit, unlike earlier acquisition of a solo licence, does not lead to increased accident involvement. Gregersen et al.¹³ found that lowering the age at which a learner permit can be obtained in Sweden led to a reduction in accident risk for novice drivers.

Reviews of school-based driver training programs (e.g. Woolley¹⁴; Christie¹⁵) have consistently concluded that there is little or no evidence of reduced accident involvement as a result of participation in secondary school driver training. Indeed, there is evidence that some programs have led to earlier licensing for many students, and hence to increased exposure for the most at-risk group and increased accident involvement.

3.2. Road safety content of educational programs

In the light of the available research on road safety generally, and on the effectiveness of school RSE programs in particular, seven general principles for minimising road trauma have been identified as having relevance to school RSE. These principles and their implications for school-based programs are as follows:

RSE should not result in increased exposure in high-risk categories.

- Programs for pre-drivers should not encourage or facilitate earlier acquisition of a solo (provisional, probationary, restricted or full) licence. School-based programs should not result in the award of a solo driver licence; nor should they lead to any reduction in the age at which a licence can be obtained.
- School-based programs should not encourage or facilitate acquisition of a motorcycle learner permit or licence.
- Programs for child cyclists, roller-bladers and scooter-users should not encourage on-road travel.
- Programs for children up to the age of about nine years should not encourage increased pedestrian exposure when not accompanied by adults or older adolescents.
- Programs for students at all levels should not encourage use of any form of motorcycle, motorised bicycle or motorised scooter.
- Programs for secondary students should encourage the use of safer motorised transport modes (such as buses and trains) in preference to less safe modes (such as private car and motorcycle use) whenever possible, subject to personal safety and mobility considerations.
- Education on walking and cycling should be conducted in a manner which encourages risk-averse use of those modes, and should be implemented in conjunction with measures to provide a safer environment for these modes.

RSE should promote injury reduction countermeasures that are known to be effective.

- Programs for students of all ages should promote the use of seat belts, bicycle helmets and other protective equipment, such as knee and wrist pads for roller-bladers.
- Programs for early primary students should promote the use of booster seats for younger/smaller children.
- Programs for pre-drivers should encourage or facilitate earlier acquisition of the motor car learner permit.
- Programs for learner drivers should encourage or facilitate acquisition of increased amounts of supervised driving experience.

RSE should provide students at each age with the skills and knowledge required to safely perform the road-related activities in which they are likely to be engaged.

- Programs for students of all ages should address safe behaviours for travelling as passengers.
- Programs for primary students should address safe behaviours for walking along, across or near roads, and playing near roads.
- Programs for early primary students should build an understanding of traffic management devices, including signals, signs, road markings and crossing supervisors.
- Programs for late primary students should address safe behaviour for cycling on footpaths and near roads.

-
- Programs for late primary students should lead to an understanding of safe behaviour for independent travel and use of public transport, including choice of the safest route for each journey.

Scarce RSE resources (money, curriculum time, teacher professional development) should not be devoted to programs that are known to be ineffective in reducing accidents and casualties.

- Driver training in vehicle control skills should not be provided at specialised off-road facilities.
- In communities where most learner drivers have the opportunity to be trained by fully-licensed family members, friends or commercial instructors, driver training in vehicle control skills should not be provided through schools.
- Students should not be encouraged to undertake traditional defensive/advanced driver training before or after they acquire a licence.

RSE should not lead students to become overconfident about their ability to cope safely with hazardous driving situations.

- Students should not be given training in advanced driving skills such as skid control.
- If driver training is provided to late secondary students, it should form one component of a broader RSE program.
- If driver training is provided to late secondary students, it should focus on avoidance of hazardous situations rather than skills to cope with them.
- Programs for learners should be promoted as a supplement to, not a substitute for, on-road experience supervised by a fully-licensed family member, friend or commercial instructor.

RSE should provide students, not only with the knowledge and skills required to be able to behave safely but also with the motivation to do so.

- Programs for late primary students should lead to an understanding of the causes and consequences of traffic accidents.
- Programs for secondary students should lead to an understanding of the costs and impacts of road trauma for its victims and the community.
- Programs for late secondary students should lead to an understanding of the penalties associated with illegal driving behaviours.

RSE should provide students with knowledge that will help them to make sense of their experiences once they leave the school system, and help to make them safer road users throughout their lives.

Programs for late secondary students should build an understanding of:

- the types and causes of traffic accidents, especially those involving young and/or inexperienced drivers
- the physiological and motivational factors that can increase the risk of a traffic accident
- the dangers associated with high-risk driving/riding/walking behaviours
- alternatives to high-risk road user behaviours and strategies to help implement those alternatives
- hazards in the traffic environment and how to identify them
- peer and media influences that encourage risky behaviour and how to recognise and manage them
- road rules

- the responsibilities associated with car ownership, including licensing, registration and insurance requirements.

3.3. Educational methods for delivery of school road safety education programs

One reason for children and young people being killed or injured in road accidents is that they do not have the necessary knowledge and skills to allow them to deal with the hostile traffic environment.¹⁶ Receiving RSE as part of their normal school curriculum is recognised as being one of the most effective ways of providing children with this type of knowledge. However, as we have seen, it is difficult to demonstrate that improved knowledge results in reduced road trauma.

A school RSE program that is solely classroom-based will be ineffective. Learning to be a safer road user involves acquiring a range of practical skills, and it is unlikely to be effective unless it occurs in a real-world environment.¹⁷ New knowledge and new skills need to be rehearsed and applied in the environment in which they will ultimately be used, or in an environment closely resembling the real traffic environment. By learning the skills in an actual, but safe, road environment, children and young people will not only learn from their errors but also become skilled in recognising high-risk situations when they do occur. The most effective programs occur where schools work in partnership with parents, carers and other key stakeholders to inform and empower young people.

Effective programs also have a clear structure within a recognised curriculum with a planned, sustained and coherent program of learning. They are outcomes-based¹⁸, and achievement of the planned outcomes is assessed.

It should not be assumed that 'one size fits all'. It is important that RSE programs cater for the characteristics of the particular age group being targeted. To be developmentally appropriate, programs must take account of the enormous diversity of physical, social, emotional and intellectual development among young people at each stage of schooling. This diversity is reflected in variable learning rates, abilities and styles. Programs should also be culturally appropriate, taking into account the social and cultural norms and patterns of the target group.¹⁶ In developing programs, the usual learning patterns and stages (not ages) should be considered in relation to factors such as the usual or available form of travel, the associated morbidity and mortality data, and the current understanding of risk and preventative factors.

An effective program provides students with small, frequent and purposeful inputs of RSE throughout their school careers. The content and processes within an effective program need to develop:

- knowledge and understanding of road traffic and the environment in which it is found
- behavioural skills necessary to survive in the presence of road traffic
- an understanding of their own responsibilities for keeping themselves and others safe
- knowledge of the causes and consequences of road accidents
- a responsible attitude to their own safety and to the safety of others.

In the absence of a distinct curriculum space in which to deliver RSE, the suggestion from key educational bodies is to take a cross-curriculum approach to RSE rather than struggle for a separate, identifiable space in an already crowded curriculum.¹⁹ One disadvantage of the cross-curriculum approach is that RSE belongs to no single learning area or teaching body. This makes it difficult to raise issues in decision-making bodies and influential committees in the school community, and to defend the subject when necessary or promote it when an opportunity presents.

It may mean that RSE has no budget for professional development and the acquisition of resources and materials. Further, a cross-curriculum approach will mean that the program probably has no distinct goals, learning outcomes or associated assessment tasks, and may lack planned sequentiality.

Learning opportunities should be provided through existing learning activities. However, it cannot be assumed that, just by using road-use/trauma data in mathematics or deconstructing a road safety advertisement in English, this constitutes an RSE program. The focus will most probably be on, for example, how to calculate percentages, and not on what the data mean and what the individual or community can do about it.

Program developers need to be mindful that taking a cross-curriculum approach can lead to an RSE program being topic/knowledge-driven rather than skills-based. The interpretation of skills here means, not only the physical skills required to ride a bike or cross a road, but also the diverse skills required to be a safer road user – such as decision-making, problem solving, effective communication, negotiation, conflict resolution, hazard recognition and hazard management, managing difficult emotions and internal and external pressures, multi-tasking and taking responsibility for self and others.

3.4. Requirements for sound delivery practice

School RSE programs are more likely to be effective if they comply with the criteria listed below.

3.4.1. Context

The program should:

- reflect the values, processes and content outlined in the curriculum document for the jurisdiction
- be outcomes-based, with outcomes that are achievable and measurable
- have content and skills that allow for progression of achievement within outcomes
- be integrated across key learning areas, while still retaining a clear road safety identity
- reflect the core values of the social and education systems
- challenge beliefs and attitudes that can lead to unsafe behaviour
- have a clear, research-based rationale, relying on data that are current and reputable.

3.4.2. Content

The program should:

- clearly define the road safety area, issue or behaviour to be addressed
- be developmentally appropriate for the target group
- have activities that lead to the achievement of stated goals of the program
- relate new information to prior knowledge, continuously building upon current and earlier learning and understandings to ensure positive and safe future behaviours
- focus on learning for understanding rather than requiring correct responses
- be interpretive, problem-based and solution-focused
- provide consistent and implementable knowledge and strategies
- employ planned, coherent, strategic and sequential content and processes

- be generally developmentally appropriate, but allow for individual and community differences
- be strategic, establishing a purpose and then providing matching strategies
- be culturally sensitive
- be gender inclusive
- not be rules- or mantra-based
- take into account geographic and environmental differences
- have a greater emphasis on skills than on knowledge.

3.4.3. *Processes*

The program should:

- focus on the processes of thinking and problem solving
- employ a variety of teaching methods to cater for individual differences in learning styles and abilities
- cater for a range of ways of organising the class, such as individual tasks, small group work and large group work
- be student-centred
- allow an opportunity to understand how self and others think and operate
- allow an opportunity to evaluate own behaviours and to consider the consequences of holding a particular value position
- include key questions of a higher order
- take place both in and outside of the classroom
- involve significant others and/or key road safety stakeholders
- have an assessment component that is linked to learning outcomes.

3.4.4. *Resources*

The resources used in the program should:

- not assume teacher knowledge of the area
- be supported by teacher professional development or comprehensive teacher advice
- draw upon or utilise contemporary stimulus materials and information that is less than five years old
- not include any bias, deception or product persuasion
- not be reliant on delivery by outside experts
- not rely on fear or shock
- have respectable and reputable authorship or source
- be visually attractive and appealing to the targeted age group.

4. POLITICAL, SOCIAL AND OTHER FACTORS RELATING TO SCHOOL ROAD SAFETY EDUCATION

RSE in schools requires considerable investment to develop suitable programs and resources, and a large investment of student and teacher time in the delivery of these programs. Despite the difficulty of demonstrating that road safety education reduces deaths and injuries, there is a firm expectation amongst most parents and the wider community that road safety should be taught in schools. The magnitude of the investment in such programs implies a responsibility to ensure, at the very least, that program content is based on sound road safety principles and that the delivery methods used are based on sound educational principles and practices.

5. CONCLUSIONS

The difficulties of conducting outcome evaluations to resolve the many questions and issues associated with school RSE programs are daunting. However, a review of past research into school road safety education, and into the broader road safety and education fields, has revealed many well-established principles and requirements that can and should be applied when assessing the strengths and weaknesses of current programs. These same principles and requirements can also be used to guide the development of new programs to maximise the beneficial effects of the program on the behaviour of road users, and to reduce their involvement in traffic accidents.

REFERENCES

- ¹ LTSA (2003). *Age and types of road users killed and injured: Year ended 31 December 2001*. Viewed on-line at <http://www.ltsa.govt.nz/research/annual-statistics-2001/docs/casualties-table-6.pdf>.
- ² ATSB (2003). *2001 Statistical Summary: Road Fatalities Australia*. Viewed on-line at <http://www.atsb.gov.au/road/stats/pdf/rfa2001.pdf>.
- ³ Cross D, Stephenson M, Hall M, Officer J and Howat P (1998). Does School and Home-based Pedestrian Education Work? In: *Proceedings: Conference on Pedestrian Safety, June, Melbourne*. (Australian College of Road Safety: Canberra, ACT).
- ⁴ Elliott B (2000). *Review of Good Practice: Children and Road Safety Education*. Report prepared for the Western Australian Department of Transport.
- ⁵ Thomson J A, Tolmie A, Foot H C and McLaren B (1996). *Child development and the aims of road safety education: A review and analysis*. Road Safety Research Report No. 1. (Dept. of Transport, Local Government and the Regions: UK). (available at <http://www.roads.dft.gov.uk/roadsafety/aims/>)
- ⁶ Tonkin C (2002). The way ahead for Bike Ed? In: *Proceedings of the Developing Safer Drivers and Riders Conference, 21-23 July 2002, Parliamentary Annexe, Brisbane*.
- ⁷ Carlin J, Taylor P and Nolan T (1998). School based bicycle safety education and bicycle injuries in children: A case-control study. *Injury Prevention, 4*, 22-27.
- ⁸ Mills (1998) cited in Elliott (2000) *Review of Good Practice: Children and Road Safety Education*. Report prepared for the Western Australian Department of Transport.
- ⁹ Mackenzie O (2002). *Public transport education programs: Public transport analysis project: Stage 1: Travel On: Primary schools: Final report*. Unpublished report to the Department of Infrastructure, Victoria.
- ¹⁰ Ampt L (2002). *Evaluation of a curriculum-based training program for novice drivers from the perspective of teachers, students and parents*. Available for download from http://www.roadready.act.gov.au/teacher/download/Road_Ready_Evaluation.pdf
- ¹¹ Drummond (1999) cited in Elliott (2000) *Review of Good Practice: Children and Road Safety Education*. Report prepared for the Western Australian Department of Transport.
- ¹² Langford J (1999). Does pre-driver training work? Yes, No, Maybe! In: *Research Policing Education Conference Proceedings Vol. 2*. (Australian Transport Safety Bureau: Canberra, ACT)
- ¹³ Gregersen (2000) cited in Elliott (2000) *Review of Good Practice: Children and Road Safety Education*. Report prepared for the Western Australian Department of Transport.
- ¹⁴ Woolley J (2000). *In-Car Driver Training at High Schools: A Literature Review*. Safety Strategy, Transport South Australia.
- ¹⁵ Christie R (2001). The Effectiveness of Driver Training as a Road Safety Measure: A Review of the Literature. (Royal Automobile Club of Victoria: Melbourne, Victoria)
- ¹⁶ Global Road Safety Partnership (2000). *Road Safety education in schools: saving young lives and limbs*. Geneva, Switzerland (www.GRSProadsafety.org)
- ¹⁷ Roberts M (1980). *Appraisal of existing material aimed at teaching road safety*. (Road Traffic Authority: Hawthorn, Victoria)

- ¹⁸ Spady W (1993). *Outcomes-based Education* (Australian Curriculum Studies Association: Belconnen, ACT)
- ¹⁹ Department of Environment, Transport and the Regions (1998). *Road Safety Education in Schools*. Available for download from <http://www.roads.dft.gov.uk/roadsafety/rs/index.htm>.