

Introduction

Arguably, the young adolescent can benefit most from a course that encourages understanding of the risks and benefits of road use. However, designing a curriculum for road safety targeted at adolescents presents great challenges. This paper describes the process behind the development of a draft curriculum in the ACT and the thinking behind the content and delivery of a course to be piloted in the near future.

The ACT-NRMA Road Safety Trust (the Trust) called for expressions of interest in safety related projects at the beginning of 1999. Interestingly, both Pedal Power ACT Inc. and the ACT Department of Education and Community Services (DECS) submitted proposals involving researching bicycle education for so called “junior high school”, that is, years 7 to 9 inclusive. Both organisations had identified the adolescent cyclist as particularly worthy of educational attention given a perceived gap in the current road safety curriculum.

At the invitation of the Trust, a joint proposal was prepared and the Trust provided funding of \$15,500 initially to carry out the research and has subsequently provided a further \$10,000 to carry out further work. The project is being carried out by Pedal Power ACT Inc., the principal bicycle community group in the ACT, in conjunction with DECS with Pedal Power playing the project management role.

The project to date has comprised a review of literature including a surveys of schools to identify current programs and an investigation of the magnitude of the road safety problem associated with bicycle use in years 7 to 9. This has been followed up by a stakeholder workshop (police, teachers, parents, educators, cycling coaches and others interested community members) and focus groups involving teachers and students.

This paper examines the findings of the literature review, the community consultation and the focus groups. It discusses the rationale for the revised approach to attacking the existing gap in the road safety curriculum. The gap is important to address if “Vision Zero” is to be more than empty rhetoric.

Literature review

The first consideration in reviewing the literature was determining the value of developing a curriculum aimed at bicycle education. Several advantages were mooted; safety, mobility, pro-social development and personal development.

Value of bicycle education

Bicycle Safety: Victorian studies (Drummond and Jee 1988; Drummond and Ozanne-Smith 1991) show 12 to 17 year olds stand out in hospital admissions studies relative to the overall cycling population. Cycling on arterial roads was found to be particularly risky for this group. While current comparable studies are not available, it is possible that a similar situation applies for the ACT today.

For information on safety of young ACT bicycle riders the best available study is Whately (1985). Unfortunately this study suffers from using data that is now up to 22

years old. However, from a methodological viewpoint it remains perhaps the most thorough study of bicycle crashes carried out in Australia to date. Rather than simply relying on police data, it also took data from hospital admissions and then surveyed those injured in a crash involving a bicycle over a four-year period. Like many crash studies, the Whately study suffers from non-availability of exposure statistics, which makes assessment of relative risk impossible.

More than half the crashes involving motor vehicles were in the 11 to 20 age group indicating that this group is particularly worth targeting for programs aimed at improving riding behaviour in a road environment.

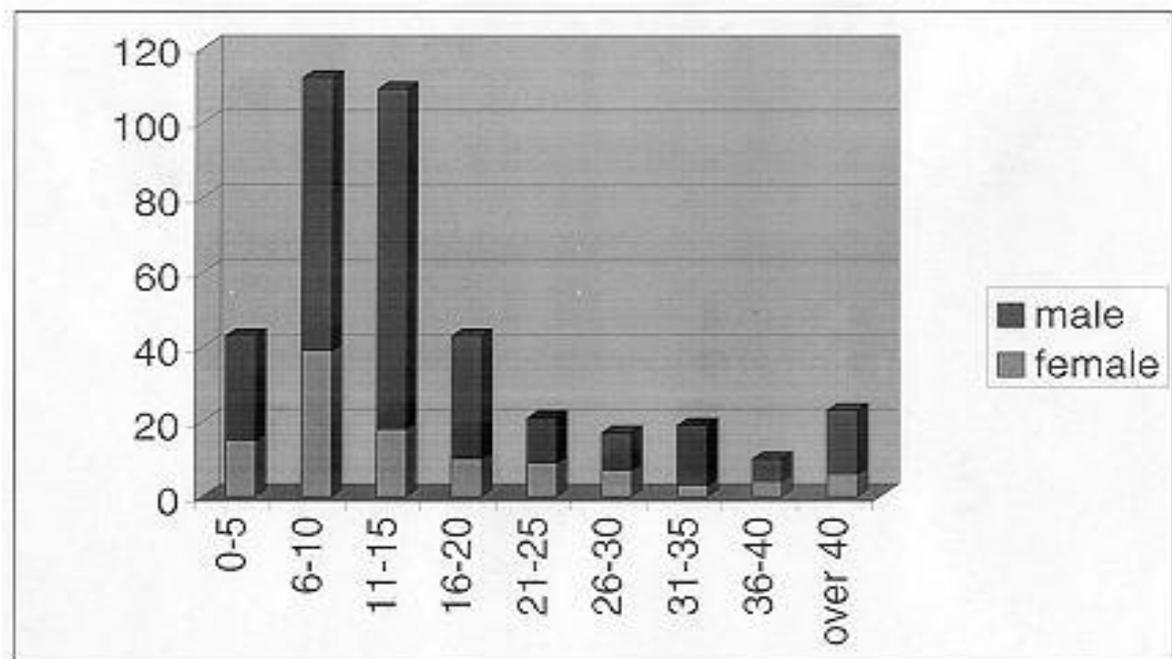


Figure 1. Bicycle casualties by age and sex - hospital admissions 1979 to 1983 ACT. Adapted from Whately (1985)

Whately's study suggests that young cyclists are more likely than motorists to have committed traffic violations in collisions involving bicycles and motor vehicles. This is especially so for cyclists under 11 years old but is probably also the case for cyclists between 11 and 15 although statistical significance is not shown. For cyclists over 16, Whately's study suggests the motorist is more likely to have committed a traffic violation in a collision with a cyclist. However, the numbers of injuries resulting from collisions with motor vehicles is relatively small. By far the greatest number of injuries across all age groups are the result of cyclist error.

Of particular interest from Whately's study is the median age by accident type shown in Table 1. This confirms the need for a focus in secondary school bicycle education on reducing conflicts with other vehicles and identifying mechanical problems as well as reinforcing the messages of primary school programs regarding handling skills and carriage of luggage. It may be that students are aware of the risks of these behaviours but accept an unnecessary risk.

**Table 1 Bicycle casualties by median age and main cause
Hospital admission, July 1979 to June 1983, ACT (Whately 1985)**

Major Cause	Median age (years)
Collision or near collision with	
motor vehicle	15
other vehicle	13
Problem with riding surface	11
Doing stunts or tricks	12
Bicycle handling problem	10
Object catching in moving part of bike	12
Mechanical fault	14
Overall	12

Whately's study provides some recommendations that can still be considered relevant today. In particular he takes the view that:

Rider training should be recognised as being as necessary and important to cyclists as driver training is to motorists. This should be reflected in the quality, style and promotion of rider training courses and manuals.

The Canberra Hospital Health Information Unit has provided more hospital data for the years 1992 to 1998 for patients aged 12 to 15. Figures to 1997 are shown in Table 2, more recent figures are not directly comparable. Pleasingly, there were no fatalities among 12 to 15 year olds in the 6 years for which figures were provided, however there was an average of 39 hospital admissions per annum attributed to bicycle crashes. It is likely that a significant number of lesser injuries were not included in the figures as these may not have gone to hospital for treatment.

Addressing the increased risks of the 12 to 17 y.o. through education in the 12 to 15 y.o. cohort has considerable intuitive appeal and appears to be warranted based on the exposure information available (Datacol 1992). It is possible that education at this time may have benefits in later years as well. It is worth citing the comments of Ampt (1995):

Children tend to use independent modes (such as walking, public transport and later car driver) without ever having been able to incrementally learn the safety features of each mode of travel by personal experience. This is due, in the case of Melbourne, to the low usage by children of the non-motorised modes of bicycle and walking.

In particular, increased use of bicycles leading up to driving age may have some flow-on benefits in terms of hazard recognition and general road sense as young people reach driving age. Recent work by Reid (Reid 1998) confirms that young drivers are particularly poor at hazard recognition and this is attributed to a lack of experience.

Table 2: ACT hospital admissions 1992 to 1997. Source Canberra Hospital Health Information unit.

	1992	1993	1994	1995	1996	1997
Collision with vehicle on street	5	6	2	7	7	2
Accident due to loss of control	0	0	0	1	0	0
Collision with pedestrian	0	0	0	0	0	1
Collision with stationary object	0	0	0	0	0	1
Other non-traffic accident	0	0	1	0	2	0
Accident on street not specified	1	0	0	0	0	0
Accident at home	3	1	5	5	1	1
Accident on street	7	10	20	8	14	10
Accident at public building	1	0	1	0	1	0
Place for recreation or sport	0	0	1	0	1	1
Other specified location	0	1	3	0	2	0
Unspecified location	14	18	4	18	19	19
Total	31	36	37	39	47	35
female	4	12	10	9	11	10
Male	27	24	27	30	36	25

Mobility: Ampt's comments above lead neatly to the issue of mobility. Independent mobility is increasingly important as children advance into and through adolescence. Silbereisen and Todt (1994) note the importance of "going places" for adolescents. Especially important for adolescents are the so-called "fourth environment" situations. These are "settings that allow adolescents to exert more self induced control than school... and other normative, adult supervised contexts". These include unstructured recreation at shopping malls, skate rinks etc.. Part of the motivation for "going places" is the possibility of creating romantic opportunities. This is a very powerful motivator and is likely to bring adolescents into conflict with parents and guardians where "going out" is limited or mobility is constrained.

Available data, while somewhat dated, suggests that bicycles play a significant role in the mobility of 12 to 15 year olds (Datacol 1992). Young people in the ACT generally own bicycles (90% of females aged 10-14 and 78% aged 15 to 19, and 97% of males 10-14 and 80% aged 15 to 19). The 10 to 14 year old males had the highest proportion (92%) of regular riders (riding at least once a fortnight). Just 70% of females in the same age group were regular riders. In the 15 to 19 year age group the proportions were 66% and 51% respectively:

Promoting pro-social behaviour / personal development: The literature on the possible effects of a cycling course on pro-social and development was reviewed. It seems likely

that extension courses involving a significant practical cycling component could well have positive effects in these domains.

Larson (1994) reviewed research on the benefits of extracurricular activity. He notes the claims that these activities provide a vehicle for social integration and, promote personal development functions. Peer associations seem to have the strongest effect of participation in extracurricular activities. This is linked to identification with a subculture. Such identification may be considered a positive outcome given research cited by Larson suggesting high school participation in an organisation is a good predictor of membership in adult voluntary organisations at age 30.

Larson cites some studies that show a negative correlation between participation and delinquent behaviour. Thus it is argued that extracurricular activities have a positive effect on personal development, but the causal direction is not clear. The question remains, does participation in extracurricular activities reduce delinquency or do non-delinquents participate in such activities?

What is perhaps more interesting, and makes one think that participation does actually reduce delinquency, is the comparison of different types of activity. Participation in competitive sports does not have the same negative correlation with delinquency as participation in “mastery” type activities such as hobbies and arts. This gives some guidance as to the emphasis that can be given in curriculum development if promoting personal development is a significant objective. A bicycle education course would need to stress the competency aspects rather than competition if the personal development benefits are to be maximised.

The value of road safety education

Despite the views expressed in the Whately study, the value of training for road safety and mobility is controversial. This is reflected in the perceived need to “reinvent” driver education (Lonerio, Clinton Brock, Wilde, Laurie and Black 1995). The controversy largely arises due to questions about the effectiveness of traditional, mainly skill based, driver-training programs. In particular the apparent inability of formal programs to produce novice drivers who crash less than those trained informally by friends and relatives. The effectiveness of programs aimed at junior high school students has not been evaluated to nearly the same extent as driver education for those over 15 but it is reasonable to assume that similar conclusions apply. A recent review of the primary school oriented Bike-Ed program comes to similar conclusions (Carlin, Taylor and Nolan 1998).

The obvious questions to address in designing a road safety curriculum that avoids the problems of traditional driver education programs are;

- 1) Why do the traditional programs fail? and
- 2) What steps can be taken to counteract these problems?

Lonerio, Clinton et al. (1995) provide a useful review of these issues. They cite research that suggests that overconfidence is an important factor in offsetting the skills development afforded by an intensive driver training program. This effect, commonly

associated with “optimism bias” as described by Weinstein (1980) and Job (1992) is particularly acute in the case of teenagers whose life experience has not had the opportunity to reduce expectations of relative good fortune.

A factor in the poor safety effect of driver education was identified as increased exposure. Formal driver education has been credited with earlier licensing and increased driving and thus more crashes. Cycling education could similarly be expected to increase cycling exposure.

Despite cautionary notes on expectations of road safety education, it is still probable that training can achieve safety benefits while at the same time providing mobility benefits and pro-social benefits – if the right course can be implemented. The question then becomes “how do we balance the skills training with appropriate attitudinal and behavioural conditioning to ensure safety?”.

A good starting point for developing a road safety curriculum is to ask the question - what makes experienced road users different to inexperienced ones (Gregersen 1996)? Having answered that question we can go on to ask- how do we train-in the risk assessment and risk aversion qualities of experienced road users?

Risk assessment and acceptance: There has been a good deal of work focussed on risk assessment generally (see Viscusi (1992) for a review). This work highlights errors in risk perception commonly made by people in different contexts.

In the road environment, risk assessment errors can be particularly acute. Young drivers tend to overestimate the risk of low and medium risk situations and underestimate risk in high-risk situations according to the study by Mathews and Moran (1986). In particular, speed and gap acceptance are greater in younger drivers. It is possible that young cyclists make the same sorts of risk assessment errors although there has not been the same level of detailed analysis as afforded to young drivers.

Confounding the issue is the question of risk acceptance and sensation seeking amongst adolescents and post adolescents (e.g. Hartman and Rawson, 1992; Horvath and Zuckerman, 1993). It is suggested that young people have a greater appetite for risk than more experienced drivers. We may not be able to say how much unsafe behaviour is a product of errors in risk assessment or of deliberate risk taking. Traditional training would hopefully reduce the former but may increase deliberate risk-taking if handling skills are improved and a sense of mastery achieved. The focus for a “reinvented” road safety curriculum thus has to be on reducing deliberate risk taking as well as improving risk assessment.

Hazard recognition: Risk assessment is often discussed in terms of hazard recognition. A comprehensive study of hazard recognition was carried out recently in the UK using laboratory simulations and on road evaluation (Mills, Hall, McDonald and Rolls 1999). This study supports the validity of laboratory simulations as a good test of on-road hazard recognition.

Similar laboratory experiments were carried out in Australia (Reid 1998). These compared novice drivers, experienced drivers and police drivers using an interactive multimedia display. Reid’s experiment was inconclusive as regards any difference in hazard recognition between formal or informal driver training methods. Experienced drivers tended to report less items but had a higher “hit” rate i.e. they identified more

objects or events that police driving instructors agreed were hazards while novice drivers identified more inconsequential items in the road environment. Police-trained drivers had a higher rate of hazard recognition and this is attributed to them being taught that driving is an inherently dangerous activity. This may be reinforced by attendance at crashes and analysis of crash sites.

Another finding from Mills, Hall et al. (1999) is that it is possible to train novice drivers to be better at hazard recognition but this did not necessarily prevent them from having the same level of crashes or infringements as control groups. The crucial factor of speed and reckless driving seem to be major factors in determining crash involvement in the novice driver. This leads one to the question of attitude and motivation and their links to ability and behaviour.

Motivation and ability: There is a substantial literature on how attitudes are formed and how this links to motivation and behaviour. Figure 2 below depicts a model of how learning, social influences and individual pre-conditions interact to produce styles of road use and risk taking behaviour.

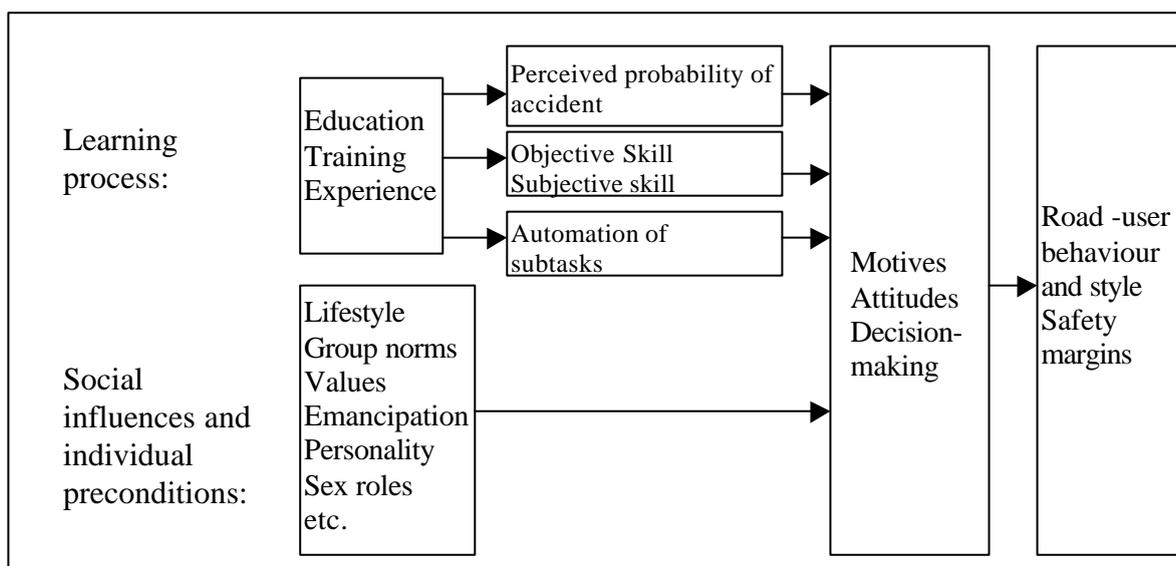


Figure 2: Model of factors significant to young road users driving behaviour and accident involvement – adapted from Gregersen 1996

The model depicted above gives an indication of the wide range of issues that can be addressed in seeking to influence road user behaviour. Ideally, a curriculum would address all these factors.

One theory of behaviour that has achieved some currency in road safety analysis is risk homeostasis theory (Wilde 1982). This posits that individuals have a certain appetite for risk and that engineering approaches designed to reduce risk are of diminishing value as people will adjust their driving behaviour accordingly by being less attentive to hazards, driving faster etc.. The logical implication of this theory is that, to achieve greater safety, it is necessary to condition people to accept a lower level of risk.

One method of conditioning, proposed by Reid (1998), is to make young road users aware of risk taking behaviour as dysfunctional in the road context. Reid's approach is

to directly relate behaviour on the road to different cognitive states and processes. In response to the question “Why do drivers drive in a way that increases probability of a crash?” Reid has developed a taxonomy of six types of dysfunctional driving.

1. *Aggressive competitive behaviour* - this includes various triggers such as predator anger, righteous anger, and frustration anger,
2. *Risk taking behaviour* – Reid suggests this type of behaviour is generally a product of fear induced exhilaration. Young road users seem to be particularly susceptible to this type of dysfunctional behaviour. This is attributed to peer influence and approval seeking. As noted by Wilde (1994) young people have more to gain from risk taking in the way of peer approval, expression of independence, feedback on task mastery and actual learning of manoeuvring skills. They also have less to lose having fewer accomplishments and responsibilities.
3. *Careless behaviour* – not recognising dangerous behaviour is something that traditional proficiency training can seek to address.
4. *Faulty schema* – this may derive from repeated careless behaviour (e.g. cutting corners, speeding or tail-gaiting) or never learning a correct schema. Included in the notion of a faulty schema is poor ability to recognise hazards.
5. *Mis-attention* – this is a particular problem when there is a high level of emotion involved or powerful distraction such as conversing on a mobile phone, having an argument with passengers, scantily clad people on the street etc. Reaction tests using various kinds of external stimuli show a marked reduction in performance when there is some level of emotional distraction.
6. *Drowsiness* – where perception shuts down, is another separate category that is particularly important in Australian rural driving conditions.

The view is strongly expressed that training that presents people with reasons they are adopting unsafe behaviour is more likely to eliminate that behaviour than exhortations to be cautious or to pay attention. There is no real evidence that this is the case but the case is persuasively put.

Existing courses for years 7 to 9

The most comprehensive material currently in the market for years 7 to 9 is the Cycle On course developed by Vic Roads (Gardner 1991). This is an extensive resource comprising 7 booklets. The first 5 books of Cycle On are designed for years 7 to 8 but can be used for older students. Books 6 and 7 deal with safely implementing a touring and recreational cycling program and are aimed at older students with more advanced safety and maintenance sections.

Courses are run by accredited instructors with accreditation being gained over a two day course run by PFC Services P/L under contract to Vic Roads. A review of the resource, discussions with the developers of Cycle On and the principal of PFC Services P/L, suggest that Cycle On is essentially a good course but could be updated and improved. This view is based to some degree on the very limited uptake of the course.

There have been no formal evaluations of Cycle On so it is difficult to judge whether it is effective in promoting safe cycling. On the face of it the course seems to have a fair amount of material that is aimed at safety but this may be outweighed by the skills focus.

In NSW, the comparable resource is the Bicycle Education Activity Manual (BEAM) (NSW Department of School Education 1992).

The BEAM resource has been provided to all government schools in NSW as well as libraries and universities. The manual draws largely on Vic Roads material and uses their diagrams as well as a number of exercises. It has been modified to the degree necessary to conform to then current NSW traffic regulations (i.e. no box turns) and includes photos from NSW.

BEAM is a flexible resource targeted principally at year 7 and 8. It is generally taught in 3 phases; (i.) bicycle control skills, (ii.) traffic skills and road rules, and (iii.) on road exercises. Each phase is generally taught over 6 or 7 lessons. Feedback from teachers implementing bicycle education based on BEAM has generally been positive according to NSW Government Schools representatives however the course requires a motivated teacher with a keen interest in cycling. There is no information available about the extent to which the course has been implemented and suffers from lack of formal evaluation.

International experience

From web searches and previous research, there appears to be very limited international experience to draw on that is accessible and readily translatable. As in Australia, most of the school focus is on primary school road safety and pre-driver education.

North American material is largely based on Forester's Effective Cycling concept (Forester 1984). This approach endorses "vehicular cycling" whereby cyclists are encouraged to ride in a predictable manner, to position themselves on the roadway assertively and to develop scanning and hazard recognition skills. CAN-BIKE, a scheme run in Canada by the Canadian Cycling Association, is an example of such a course. It runs a series of graded accreditation courses for cycling instructors who then organise their own courses. A prerequisite for several of the instructor accreditation courses is previous teaching experience. The course focus is on operating bicycles as vehicles, bicycle touring and bicycle maintenance. The program is intended to meet the needs of cyclists of all ages.

For students 9 to 14 the course comprises two elements; *Smart Cycling* which is largely class-room based with some off-road drills, and *Cycle Right*, a hands on course involving four or five sessions of 1.5 to 2 hours each (8 to 10 hours in total). The course is supported by a series of manuals and uses reference videos as teaching aids.

Similar courses are run through the League of American Bicyclists in the US. Their website (<http://www.bikeleague.org/advocacy/adeccd.html>) describes the courses available at the current time.

Some States in the US also offer cycling education through school programs. These often have a focus on promoting helmet wearing e.g. Yuba County, California (<http://www.nhtsa.dot.gov/people/outreach/safedige/Spring1997/n4-23.html>). Some States also offer in school programs based on the Effective Cycling model (e.g. the Florida Traffic and Bicycle Safety Education Program <http://grove.ufl.edu/~lcrider/programpage.htm>).

The Royal Society for the Prevention of Accidents (ROSPA) in the UK did run cycling courses at one stage but these no longer appear on its list of courses. ROSPA is currently promoting the concept of a separate unit in the school syllabus devoted to risk and safety emphasising that it is one thing to “teach safely” but another to “teach safety”. It is sponsoring a number of research projects investigating ways to teach about risk and hazard recognition.

Informal cycling courses

In addition to formal teaching of cycle education in schools there is a variety of school based and community based informal bicycle related education.

In order to find out what is currently going in schools a fax survey was administered to all government and non-government high schools, a total of 33. Only nine schools responded to the initial survey and, of these, six reported some cycling activities. Another two schools are known to have some cycling based activity. Follow up calls were made to other schools but no significant cycling activity or road user education was reported in the year 7 to 9 age group.

Conclusions from the literature review and fax survey

The conclusions from the literature were that there is a very good case for introducing or improving bicycle education for students in years 7 to 9. This case is based on:

- the significant existing level of use of bicycles
- the poor safety record of this group and the succeeding cohort – years 10 to 12 as they become drivers;
- the personal development value of a non-competitive activity such as cycling and
- the pro-social potential for a course that involves students integrating into the community.

Despite the good reasons for believing there is a place for bicycle education in the school curriculum, significant traps were also identified. Often skill enhancement programs have been found to be ineffective or even counter productive in safety terms. To overcome this problem it is necessary to focus on attitudinal / motivational factors. Recent research suggests that teaching students about dysfunctional cognitive states and processes may enhance their ability to identify dysfunctional behaviour in themselves and help to eliminate it.

There is a limited amount of material currently available that can be used to build up a revised curriculum. The Cycle On course from Victoria is probably one of the best existing resources in terms of a sequential approach to learning cycle craft with some

emphasis on developing appropriate motivation. The concern with this course was that it had received a very low take up rate and was not being used at all in the ACT. The NSW equivalent course was also not being used widely in NSW or at all in the ACT. A fax survey of schools in the ACT asking about current programs involving bicycle education gave an indication of the limited interest in bicycle based programs during the early high school years.

Stakeholder Workshop

The results of the literature review were presented in a half-day workshop. Invitations were sent to all schools, representatives of the police currently involved in road safety education, cycling coaches, community bicycle groups, youth workers and others. Twenty-two people attended the workshop. The conclusions of the workshop were that for a bicycle course to succeed would require;

- ◆ Some ongoing funding to put in place a course.
- ◆ A program that is attractive to parents and students.
- ◆ A mechanism to obtain enthusiastic and talented program-leaders.
- ◆ Links with the bicycle industry at retail and wholesale level
- ◆ A good pedagogical basis that achieves the aim of improved safety while at the same time containing messages of health, personal development, the role of cycling in independent transport, an understanding of sustainability in transport and life choices, and the requirements for success as a competitive cyclist.
- ◆ Teachers currently providing bicycle excursions would value provision of a bicycle resource for tours.

An attempt at assimilating the often-conflicting views put in the workshop was made into an options paper that was reviewed by the steering committee. Four options were outlined for the provision of a course. Essentially they comprised a classroom only option, an option including a practical component, an option including a specialist itinerant teacher, and the final option including provision of a fleet of bicycles for use by students. The fifth option was not spelt out – it involved abandoning the concept.

Focus Groups

Having developed the various broad course options it was appropriate to test their attractiveness and practical problems attached to each. This was done by way of focus groups carried out at one government school and one private school. Focus groups involved a group of teachers at each school and a group of students at each school.

Reactions to the models were anticipated to some degree however it was useful to have certain ideas confirmed. In particular it was useful to check on some general attitudes towards cycling. These varied quite dramatically. There were both students and teachers who considered that bicycles are “incompatible” with motor vehicle traffic while there were others who thought positively of cycling and saw sharing of roads by cyclists and motorists as not an enormous problem.

Views on the various options are summarised below:

Model 1- classroom only course

Teachers and students considered that for a classroom only course to be effective it would need to attract the interest of students. Teachers with experience of the ACT's Road Ready pre driver education program were very positive about what could be achieved with a classroom only course.

Students volunteered that an in-class course could be too boring to have much interest for students. They suggested that you learn by doing rather than by sitting. When pressed as to how to make an in-class course interesting they suggested a range of audio-visual and interactive teaching aids.

Teachers also suggested that having a good resource kit, such as that provided to students as part of Road Ready, would be of benefit.

Model 2- practical cycling course

All groups noted the advantages of model 2 as an opportunity to develop skills and develop personally. There seemed to be a belief that getting students outside the classroom is essential for learning!

The teachers stressed the need for a well-trained teacher and appropriate funding for relief teachers to allow low student: teacher ratios. Issues of safety and liability were also of concern as were timetabling issues and having access to bicycles. Splitting up classes was seen as a possibility with one half doing a practical and one half doing a theoretical component. Some children have good bicycles and some have none or very poor quality bikes. This could create a problem. It would also be a problem getting bikes to school for a number of students.

Students were especially positive about the prospect of outdoor learning but noted the difficulties of bringing bicycles to school and possible problems with poor quality bikes or envy associated with very high-end bikes.

Teachers were concerned about the control issues and potential liability.

Model 3 – practical cycling course taught by specialist teacher

Students thought a specialist teacher was likely to add “credibility” to a course. Presumably, credibility includes some notion of ongoing commitment to a course and a level of expertise. The novelty aspect – a new face and character, anecdotes and experiences – also seemed to be important for attracting interest.

Teachers could also see advantages in having a specialist teacher. They suggested that such a teacher needs to have some charisma with real capability in teaching, not just cycling. They saw the advantages in having a specialist teacher especially for assisting regular teachers in practical sessions where one teacher is not enough for adequate supervision.

Model 4 – specialist teacher with fleet of bikes

Providing bikes was seen as enhancing equity for students who don't have bikes (or functioning bikes). Teachers saw provision of bikes as maximising the riding time as opposed to the time spent getting bicycles checked. A number of variations of bicycle provision were discussed.

Providing helmets was also seen as an issue for running practicals. It was suggested that students should have their own helmets as a hygiene issue.

Other suggestions

Participants came up with a long list of suggestions for a course including:

- Students thought that popularity of the course (if not compulsory) would depend on who decided to opt in – if popular students opt in then there would be a flood of interest and visa versa for unpopular students.
- Students surprisingly saw the need for the course to be compulsory. Some teachers took the opposite view on the basis that not all people will go on to be cyclists. Others saw a compulsory course as reasonable as a lead in to pre-driver training but the practical aspects would be beyond a small number of students.
- An ongoing course was considered important rather than just one or two sessions if there is to be any lasting benefit.
- Dealing with different skill levels was seen as a major issue for on-road instruction.
- To make a course significant to the students, it was suggested that they should have something to take away such as a map of the bike paths or a resource book.
- Students saw the need for learning about how to deal with dangerous or threatening situations (animals, other road users etc.).
- Teachers saw an end of year bike tour as a good lure for attracting and motivating students.

A bottom line position for teachers was that the course would succeed or fail depending on the quality of the teaching. If a good teacher were available the course would be likely to succeed. For students the key factor seems to be level of interest (which may be equivalent to the quality of the teacher).

Conclusions after focus groups

Based on the comments of focus group participants the steering group assembled to determine the appropriate way forward. While there was a considerable amount of disagreement at this stage, mainly about the allocation of the remaining study budget, it was resolved that the approach to be taken was to:

- develop a pilot in-class course;
- run the course at two schools;

- carry out a survey of students, parents and teachers to evaluate the course and quantify implementation issues for practicals (eg numbers of students without bikes or helmets, cycling experience, types of cycling of interest).

By moving forward in this manner we would gain valuable experience about what works in class and what does not and some materials would be prepared that could be used by teachers who want to do something in the absence of a more widespread course.

Draft curriculum

A draft curriculum has been developed that is focussed on content. While pedagogical elements need to be refined, there are many interesting issues for teachers and students to address.

The course has been designed to fit well within the SOSE (Study of Society and Environment) area of the school curriculum as it contains elements of history geography, environment, health, self-image and society.

It is intended that a pilot course be delivered using this content. The pilot will take place in conjunction with surveys of students and teachers. There would also be a take home survey for parents. Aims and core components of the course are set out below.

Aims of the course

- Introduce concepts of road use in society
- Introduce risk theory
- Introduce cognitive theory and effect of cognitive states on risk taking behaviour
- Apply principles to use of bicycles

These aims would be covered in five segments. Ideally these would be delivered one segment per class over five classes. There would be room however for expanding the content according to the particular interests of the teacher / students. The five segments, or components, are set out below.

Key elements of Road-Aware Course

Component 1: Transportation and urban form

- Why do we travel
- Transport and personal identity
- Transport technology and history
- How does transport affect urban form
- Likely transport developments

Component 2: The road system and the environment

- Roads, greenhouse effect and global pollution

- Roads and local pollution

Component 3: The road system, health and safety

- What is the road toll – what should it be? What could it be?
- Balancing health and safety
- Who / what is responsible for the road toll
- Major risk factors

Component 4: Addressing road safety through education

- What is bad road use – versus responsible road use
- Dysfunctional road use
- Risk theory – risk estimation, risk acceptance, behavioural responses, risk taking behaviour vs risky behaviour.

Component 5: Cycling as a case study

- Cycling – pros and cons
- Cyclists' responsibilities as road users
- Cognitive states when cycling
- Cycling techniques and core skills
- Key cycling problems
- Opportunities to pursue cycling

This curriculum is very different to the sort of practical curriculum that was originally envisaged when the project was commenced. There are clearly a number of reasons why the change in emphasis has taken place. These can be broadly broken down into negative reasons and positive reasons.

The negative reasons are the practical and logistical problems with cycling courses and pedagogic problems such as the overconfidence and optimism bias factors identified in the literature review relating to skills based driver training. Positive reasons for adopting the emphasis in the course above are the good integration with the ACT pre driver training course for year 10 students and the sound theoretical approach of emphasising cognitive processes in road user training.

The pilot course also provides an excellent opportunity for data collection and examination of options for a practical cycling component tailored to the actual demands of students.

Conclusion

This paper has described a process of research into the feasibility of a course to promote safe cycling for adolescents. As a result of the research, a very different approach to teaching and learning has been developed compared with the existing models of bicycle

education and the initial ideas about how a course might be put together. The result has been a significant de-emphasis of cycling at this stage with a view to having a course that addresses teaching safety rather than safely teaching.

What has become obvious from the research is that our original ideas about providing bicycle training were off the mark. School based bicycle education courses are unlikely to be interesting to students in years 7 to 9. Furthermore, courses involving a significant practical component frankly terrify many teachers and schools. These have visions of having to deal with problems such as; lack of bicycles, mechanical problems, a vast difference between students and between teachers in aptitude and attitude, students splattered over the roads, indiscipline and time constraints.

Having heard these messages the project steering committee has gone back to the drawing board. What we have come up with is a course currently entitled *Road Aware*. This course is designed to appeal to students by covering, in an interesting way, issues associated with our transport systems, future developments in transport, sustainability, urban design and health and safety. It draws upon psychological models of driver behaviour and risk acceptance and uses the students' experiences on bicycles as the examples. An advantage of this type of course is that it can be readily integrated into the SOSE portion of the school curriculum, and can be attractively packaged for teachers. It also offers a base for extra-curricular courses covering practical aspects of cycling, whether they be mountain biking, touring, BMX or racing. These would be contingent on a demonstrated interest from students and teachers.

The next step in the process will be trialing the course in conjunction with surveys aimed at identifying students' views on the course as well as its effectiveness in getting concepts of responsible road use across. Surveys of teachers and parents will also be carried out. Of course trialing the course will require the cooperation of schools and this is being sought at the current time.

The early work on curriculum development was really done with the view that the final curriculum would have a significant bicycle component. As the stakeholder consultation process has progressed, it has become apparent that there are significant difficulties in having too great an emphasis on practical cycling in a school-based program.

A number of questions remain including whether the draft curriculum will be;

- Well received by students and parents;
- Attractive to teach; and,
- Effective in communicating the essential elements of the course including the opportunities and risks of road transport, and the importance of maintaining an appropriate cognitive state when using roads whatever mode is being used.

These questions will be evaluated by way of surveys at the time of implementation of the pilot courses. Surveys will also gather up to date data. A travel diary will provide information on exposure of the study group. Other questions will address issues that go towards the feasibility of implementing practical extensions to the course such as parental permission, bicycle ownership and condition, preferred types of practical course, willingness to pay etc.

The research project described is a rare case of research actually looking at a problem and coming up with a solution that does not closely mirror the previously held ideas of the people who proposed the project brief. Hopefully, the proposed solution will be successful in addressing an acknowledged gap in road safety education and creating a culture where a “Vision Zero” approach to road safety is more than a dream for all classes of road users.

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