The 2012 NRMA- ACT Road Safety Trust Churchill Fellowship to study Cycling and Road Awareness School Curriculum Development, Study Tour Denmark, the Netherlands and the UK

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Signed Terry Eveston Dated 12 August 2013
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1. INTRODUCTION

The 2012 NRMA-ACT Road Safety Trust Churchill Fellowship allowed me to travel overseas to study cycling and road awareness education programmes in Denmark, the Netherlands and the UK and to attend a cycling conference in Austria.

This report provides a summary of my findings, some international comparisons and recommendations for possible future Australian initiatives.

I extend my very grateful appreciation to both the Winston Churchill Memorial Trust of Australia and the NRMA-ACT Road Safety Trust.

I would like to thank the people who met with me and allowed me to join in with their cycling and road safety programmes, Rikke Stobbe, Ole Larsen, Janne Gundersen, Johan Heichelmann, Jakob Schiott, Christel de Heus, Tineke Doedens, Ronals Wittenberg, Anglea van der Kloof, Annie van Cleve, Wilma Slinger, Michael Frearson, and Paul Robinson.

The people I met working in this field were very generous in their willingness to share experience and resources. There is a community of people around the world who are deeply passionate about improving cycling safety for children and are keen to share and help others attain similar outcomes in their own countries. There is a wealth of experience that can be drawn upon and adapted for use in an Australian cycling and road safety education programme.

Thank you to my wife Inga for her support.
2. EXECUTIVE SUMMARY

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Ph: 0415 706644

Project Description
To observe and participate in activities that develop a child's capacity for independent responsible and safe behaviour when cycling on roads, cycle ways and multi user paths.

Highlights
In Denmark I met with Jakob Schiott from Cyklistforbundet (Danish cyclist union). He highlighted the importance of children's cycle playgrounds. Janne Gundersen from the Council for Safe Traffic provided an overview of Danish cycling and road safety education programmes. In the Netherlands, Angela van der Kloof shared her experiences with teaching introductory cycling lessons to migrant women. I was fortunate to assist Tinneke Doedens in delivering the Verkeerseeducatie programme in a Dutch primary school.

Attendance at the Velocity conference in Vienna provided the opportunity to meet and compare approaches with experts from around the world. Lastly, I observed the delivery of the Bikeability programme with Paul Robinson and Michael Frearson in Cambridge, England.

Findings
1) Cycling and road safety education is delivered through schools in all the countries I visited. School based programmes are used for their potential to reach large participant numbers. Many programmes are linked with school based active travel initiatives.

2) Teachers involved in delivering road safety education acquire skills in this area after they begin working in schools. Providing teachers with professional development and resources in road safety education increases their interest and engagement levels.

3) Emerging best practice in Denmark and the Netherlands is to embed cycling and road safety education into regular school activities. Regular reinforcement of road safety education improves retention of learning and adoption of safer road use behaviour.

Recommendations
1) Develop cycling components for use within school based road safety education programmes in Australia.
2) Develop cycling and road safety training resources for use by teachers within primary and secondary schools.

Implementation and Dissemination
In 2011, I finished writing the Safe Cycle programme which teaches cycling and road safety to upper primary and lower secondary students in Canberra. The knowledge that I have gained during this Fellowship will enable me to improve and modify this programme. I will be able to further share information at teacher professional development sessions I am scheduled to deliver later this year.

The Transport and Road Safety research group from the University of NSW is undertaking an evaluation of school based cycling and road safety education, using Safe Cycle as the case study. I will be involved in this research project.

It is my hope that my experiences in developing school based road safety education will assist in the development of an effective, broadly used, Australia wide road safety education programme.
3. PROGRAMME

Denmark Monday 22nd April to Friday 17th May
- Rikki Stobbe, Ministry of Children and Education Department Office of Children and school.
- Ole Larsen Engholmskolen cycling and road safety coordinator
- Henrik Soeborg, President Copenhagen Mountain Biking Club
- Janne Gundersen, Council for Safe Traffic
- Johan Heichelmann, Copenhagen Municipality, The Technical and Environmental Administration Department of Traffic, Safe Roads to School Programme
- Jakob Madsen, Politisk Konsulent Cyklistforbundet

Personal travel Saturday 18th May to Monday 27th May

The Netherlands Tuesday 28th May to Monday 10th June
- Tineke Doedens, Verkeerseducatie Traffic and - Educational Coordination Office
- Annie Van Cleve, Mobycom Concordis Groep, Delft Cycling Exam
- Christel de Heus, Coördinator educatie basisonderwijs
- Ronald Wittenberg, Verkeerseducatie Traffic and - Educational Coordination Office
- Angela van der Kloof, Mobycom Concordis Groep, Utrecht Traffic Garden
- Wilma Slinger, Senior Advisor Ministry of Transport

Austria Tuesday 11th June to Friday 14th June
- Velocity Conference

United Kingdom Monday 17th to Thursday 20th June
- Paul Robinson, Cycle Training Affinity
- Michael Frearson, Director of the Association of Bikeability Schemes
4. **RATIONALE AND SCOPE**

My area of expertise is teaching road safety to young cyclists. I developed a cycling and road safety education programme called Safe Cycle for primary and secondary schools in Canberra. I also deliver professional development to teachers to enable them to teach the Safe Cycle programme in their schools. My Churchill Fellowship focused on cycling and road safety education programmes targeting young riders.

Denmark and the Netherlands were chosen because of their well regarded school based cycling and road safety education programmes and high cycling participation rates as demonstrated by these cycling participation statistics.

- In the Netherlands, 27% of all journey-to-work trips are by bicycle.
- In Amsterdam, up to 40% of all journey-to-work trips are by bicycle.
- In Denmark, 16% of all journey-to-work trips are by bicycle.
- In Copenhagen, 40% of the population use cycling as their primary mode of transport.\(^1\)
- In Australia, 1.27% of all journey-to-work trips are completed by bicycle.\(^2\)

England was chosen because of its well established national programme called Bikeability.

The late primary/early secondary school age group was selected as they are the ones most likely to benefit from cycle and road safety education programmes.

- Statistics from the Australian Transport Safety Bureau (ATSB) indicate that the 10-19 year old age group has the highest percentage of cyclist deaths in road crashes.
- Risk taking behaviour in 10-19 year olds is well documented and recognised as a contributor to adolescent harm. Young cyclists have been identified as more likely to take risks.\(^3\)
- Parental supervision behaviour typically changes for a child when they reach twelve years old. From twelve years of age a child graduates from primary to secondary school. They become more independent and are more likely to be riding without an adult assisting them to negotiate traffic situations. In some Australian states, a child is no longer allowed to ride on a footpath by law once they turn twelve and must ride on a road in the absence of dedicated cycling infrastructure.
- Fault is attributed to the cyclist in a high percentage of cyclist fatalities resulting from road crashes, particularly at intersections or when the cyclist was moving from a footpath to the road. *A report by the ATSB from 2006 indicates 2/3 of these fatalities were due to cyclist error, though this figure has been questioned in recent studies.*
- I have observed that young cyclists are often capable riders who have a good understanding of road rules. The degree to which young riders comprehend traffic situations and respond to them in ways that consider their own and other peoples' safety is what puts them at risk. Interestingly, this observation was repeated by almost all of the people I met on my Churchill Fellowship who were delivering road safety education to young cyclists.

Cycling and road awareness education has great potential to reduce road trauma for young riders. Educational approaches are very inexpensive when their cost is considered in the context of transport infrastructure budgets. Education which targets the most at risk group is a very cost effective approach for reducing cyclists' road trauma. Establishing safe road practices in pre-driving adolescents may also result in them eventually becoming safer drivers.

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\(^1\) Dutch and Danish cycling participation rates from the Danish and Dutch Cycling Embassies


\(^3\) Developing a Safer Cycling Strategy for the ACT GTA Consultants, 2012
There are many components that contribute towards reducing road trauma for cyclists. In particular, cycling and road infrastructure plays a vital role in improving participation rates and road safety for cyclists.

A discussion regarding the effect of cycling infrastructure is beyond the scope of this study, however the vast majority of experts I interviewed considered that well designed and maintained infrastructure was the most important factor in cyclist safety.

It should be noted that many of the programmes I observed were cycling components of a broader road safety education.

**Chart of Child Developmental Periods Used in this Report**

Recognising that children develop at different rates, it is simpler to refer to broad developmental periods rather than specific ages. This chart links these developmental periods to age and school year level in Australia.

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<th>Years of Age</th>
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5. OBSERVATIONS AND FINDINGS

Defining Goals For Cycling And Road Safety Education

There are some common learning outcomes in the cycling and road safety programmes I observed in Europe. These outcomes could be viewed as goals for developing an ideal utility cyclist.4

Cycling And Road Safety Education Goals

- To achieve competency in bike handling skills, in a variety of situations;
- To understand and obey road rules, in both theoretical and practical applications
- To develop traffic observation skills and protective behaviour, to observe and respond in a manner that is considerate towards own and others' well being; and
- To attain competency in basic bike maintenance, to maintain a bike in a reasonable road worthy condition, or to recognise faults requiring further assistance.

Programmes achieve these goals through

- Theoretical sessions in the classroom to learn about road rules and traffic situations;
- Practical skills sessions within school grounds to develop skills transferable to traffic situations; and
- Guided cycling on the road.

Programmes from Denmark and the Netherlands work towards an on road cycling examination for students of upper primary and lower high school age.

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4 The 'utility' cyclist is a term used to describe a cyclist who uses their bike for transport as part of everyday life rather than just for sport or leisure.
Parents Have A Significant Influence Upon A Child's Cycling Behavior

Parents are important role models for their children. Their attitudes and behavior can greatly influence their child's approach to road safety. Parents have the potential to train their child from a very young age in real traffic situations. Children are introduced to cycling in Denmark and the Netherlands from a very young age. In both of these countries, there is a high expectation that parents will teach their child cycling and road safety. It is a very common sight in the Netherlands to see a small child of about two years of age in a child bike seat in front of the parent and behind the handlebars. In Copenhagen, 25% of families with two children or more have a 'cargo bike', a three wheeler bike with forward facing child seats directly in front of the rider. Children seated immediately in front of their parents on these bikes have an unobstructed view of the road and are easily able to hear their parents talking to them.

Teaching road safety at the road side and applying skills in context has been demonstrated to improve a child's ability to make safe traffic judgements. Engaging parents to support and re-enforce road safety leaning is important.

When recognising the role of parents in teaching road safety to their children it is also important to recognise that parents often don't have an understanding of how influential their behaviour modelling is to young children. It is also worth noting that most parents will be unaware of best-practice in cycling and road safety education.

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6 For further reading on the role of parents in road safety education Monash University Accident Research Centre released a report entitled Parents as Role Models in Road Safety December 2010 Report no. 302
The Australian context for including parents in cycling and road safety education is different to that of Denmark and the Netherlands. The culture of utility cycling is not as strong in Australia. Only 1.27%\textsuperscript{7} of all journey-to-work trips in Australia are completed by bicycle as opposed to Denmark (16%) and the Netherlands (27%)\textsuperscript{8}. Australia does not have an equivalent confident and willing parent base of cyclists experienced in utility cycling to instruct children in cycling and road safety.

About 4% of trips to school by Australian children are completed by bicycle\textsuperscript{9}. 44% of school children surveyed in Canberra reported that their preferred mode of transport to school was by bike\textsuperscript{10}. 66% of Australian children aged 5-9 cycle in a typical week\textsuperscript{11}.

The above figures demonstrate that Australian children are interested in cycling but are not commonly cycling to and from school. Parental concern about the safety of cycling is recognised as a contributor to low participation rates of cycling in children. Supporting parents to be more confident about cycling safety is required.

Schools have established relationships with parents, which could be used as an avenue to engage parents to be involved in their child’s cycling and road safety education and support them to be role models.

\textsuperscript{7} Australian Bureau of Statistics Census data 2011, Journey to Work.

\textsuperscript{8} Danish and the Netherlands cycling participation rates from the Danish and Dutch Cycling Embassies

\textsuperscript{9} Australian cycling statistics from the Austroads 2011 Cycling Participation Survey

\textsuperscript{10} ACT Government Health Directorate, 2012 Ride or Walk to School programme

\textsuperscript{11} Munro, C. and Australian Bike Council (2011). Australian Cycling Participation: Reporting for the National Cycling Strategy 2011-2016. Sydney, Austroads Ltd
Cycling Play In The Very Young Can Build Confidence And Transferable Road Safety Skills

The Cyklistforbundet (Danish Cycling Federation) in Denmark developed a bicycle garden for infant cyclists from 2 years of age called the Cykellegebanen. The bicycle garden consists of a series of portable cycling obstacles. Free use of helmets and bicycles (traditional pedal and 'balance' bikes without pedals) are provided by the Copenhagen Municipal Council. It began as a temporary facility for cycling celebrations in Copenhagen when Denmark hosted the UCI Road Cycling World Cup in 2011. The bicycle garden is very popular and still in high demand. It was designed to be transportable and is regularly moved to different parks around Denmark. A representative from Cyklistforbundet commented that the portability of the bicycle garden is great as more people are able to take advantage of the facility, but transportation and setting up is a burden. Redevelopment as a permanent facility in multiple locations is currently underway.

The obstacles enable very young riders to develop their bike handling skills in a safe environment. The bicycle garden also encourages the development of observational and spatial awareness skills as children need to be observant and responsive to each other. Development of skills to accurately judge distances and speed of movement in young children are very transferable to traffic situations and may result in safer behaviour at the road side.

A five and two year old on the Cykellegebanen 'bicycle garden' in Copenhagen, Denmark.
It has been the experience of the Cyklistforbundet that children enjoy playing with their bicycles on the obstacle course and that parents bring them back repeatedly. Engaging children in something that they enjoy creates a very effective learning environment.

In addition to its educational value for children, parents are supported to be involved in their child's cycling and road safety education right from the start. At the bicycle garden, the Cyklistforbundet provides parents with road safety information and government agencies responsible for health provide information encouraging active travel.

In addition to the bicycle garden, the Cyklistforbundet has developed 30 cycling based games to improve cycling confidence and handling skills. Cyklistforbundet members work with teachers encouraging inclusion of these games in primary schools.

A close up of one of the obstacles, designed to create an uneven moving surface. This obstacle develops the child's sense of balance and confidence to safely respond to a changing road surface.

Bikes available for loan at the Cykellegebanen in Copenhagen, Denmark.
School Based Programmes That Allow For Repetition Over A Broad Period Of Time Are More Likely To Be Effective Than Isolated Training Sessions

Retention of information and long term protective behaviour changes are viewed as goals for best practice in road safety education. Programs that enable repetition of road safety training over an extended period of time are more beneficial than only short term intensive programs. This sentiment was expressed in three separate interviews with Johan Heichelmann from the Copenhagen Municipality, Jakob Schiott from the Cyklistforbundet and Marianne Weinreich from Vekso Mobility, a consulting company in Odense Denmark.

Studies indicate that retention of information and positive behaviour changes are lost in a significant number of students after three months without reinforcement of learning. Relying upon specialist instructors from outside the school to deliver a programme over a short period of time has limited long term benefit. Teachers\textsuperscript{12} are well placed to maintain ongoing reinforcement of road safety learning in schools. In pointing out the benefit of teachers delivering road safety education, the following is worth consideration: even in countries where road safety education is a required part of school curriculum the scope of delivery depends to a high extent on the engagement and interest of individual teachers. Marianne Weinreich from Vesko Mobility highlighted the importance of identifying and supporting the 'champion teacher' who already has an interest and can encourage and lift their colleagues' engagement. Meaningful professional development and availability of good quality teaching resources are necessary to ensure high levels of teacher engagement, thereby establishing an acceptable standard of road safety education delivery \textsuperscript{13}.

Strategies For Delivering Cycling And Traffic Safety Programmes In Schools

Developing strategies to include road safety education in schools is required as the methods of delivery can greatly influence its effectiveness.

The most common reason for not including road safety education in schools is curriculum crowding as indicated by a Canberra based study\textsuperscript{14} from 2005 funded by the ACT NRMA Road Safety Trust. Even if road safety programmes are taught in schools, the scope of delivery and effectiveness can be limited by curriculum crowding.

Road safety education is not a subject in its own right even in countries where it is compulsory such as Denmark and the Netherlands. Its inclusion is seen to be at the expense of other subject areas. Piecemeal approaches to road safety education reduce its effectiveness and contribute to a perception that it is ineffective. A European study\textsuperscript{15} recommended that road safety education should be linked to one clearly defined subject, or in the case of integration across the curriculum to include an operational co-ordination mechanism. When there is no clear link between a defined subject area and road safety education it is very easy to diminish it or simply squeeze it out of inclusion in school. Unfortunately road safety education was temporarily removed from many schools in Denmark during my Churchill Fellowship. There was an industrial dispute which resulted in the closure of nearly all Danish schools for a number of weeks. When schools reopened, many elected to recover lost learning time by concentrating on defined subject

\textsuperscript{12} Professional cycling instructors could also be effectively used, though as they are not placed within a school, strategies to maintain their regular involvement would need to be developed.

\textsuperscript{13} Inventory and Compiling of European Good Practice Guide on Road Safety Education Targeted at Young People, 2005.

\textsuperscript{14} Determining the Optimal Time for and Type of Road Safety Education in ACT Schools, Gayle Di Pietro & Ian Hughes, 2005.

\textsuperscript{15} Same as footnote #13
areas and cancelled their road safety programmes.

The lack of specialist road safety education teachers is another recurring theme for resistance to inclusion of this type of education in schools. Pre-service teacher training does not include road safety education. Teachers delivering road safety education can only learn these skills when they start working. Identifying and supporting ‘champion’ teachers with an interest in road safety education is vital.

The following are examples of some strategies used to include road safety education in European schools.

**Denmark**

Each primary and secondary school in Denmark is expected to have a teacher who is responsible for the delivery of cycling and road safety education. The teacher is usually self-selected as they have an interest in this area. These teachers have the opportunity to attend a 3 day course on children and traffic which is regularly offered by the Danish Council for Road Safety. The professional development includes practical road safety education elements, such as bicycle handling skills as well as presentations of recent research, accident statistics and current road safety legislation.

Road safety education is not a defined subject and is taught in addition to the usual subject. During the period the teacher runs the road safety education programme it counts towards their teaching workload.

Resources to teach road safety are available and include classroom teaching materials about road rules, suggested activities to develop cycling skills and a portable obstacle course\(^{16}\) that can be hired free of charge. It is the teacher's responsibility to select the resources and adapt them to suit their school. Students are removed from their usual classes to undertake this programme which concludes with an on road cycling exam. Students lose points for incorrectly negotiating traffic situations during the exam. To motivate students, individuals and classes can win prizes.

**Odense, Denmark**

The consulting company Vekso Mobility is contracted by the Odense Municipal Council to oversee an initiative to increase active travel in two schools. Their approach is to encourage the use of cycling across the curriculum. The initiative has dramatically increased student cycling participation rates. Ninety percent of teachers in the two schools incorporate cycling into at least two lessons each month. Students play Cyklistforbundet bicycle games in Physical Education classes. History and Visual Art students cycle to local galleries and museums. Science students cycle to local parks to conduct field research. As cycling has become so embedded in the day to day activities at these schools, almost all students cycle to and from school. The schools have spare bicycles and helmets for loan to students who have not ridden to school that day.

Road safety education becomes implicit in the everyday activity of these schools. Teachers demonstrate safe behaviour in context when they take their classes on excursions. Road safety concepts are utilised in the selection of safe routes to travel to and from locations. On-road instructions are provided for traffic situations as they are encountered. In addition to the approaches recommended by the private consulting

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\(^{16}\) The Danish Council For Road Safety’s obstacle course has been designed for older students than the Cykellegebanen (bicycle garden). An observations from the teacher in Allerød about this course was that it is hard to use with a class group as only one student may use it at a time and the rest of the students get restless waiting for their turn.
company, these schools can still access the commonly used model in Denmark for cycling and road safety education.

**Copenhagen, Denmark**

Other areas of Denmark are using similar strategies to those in Odense to embed cycling into schools. The Copenhagen municipality has developed a nature park with bicycle paths called 'Kalvebod Fælled', to be used by school groups. Lessons have been specifically written in the areas of science, biology and geography that are relevant to different areas of this nature park. Students and teachers use cycling for transport to and from these field trips.

Cycling and road safety education becomes integrated into regular school activities, providing frequent opportunities for teachers to role model safe behaviour. Positive role modeling is influential in encouraging the adoption of protective behaviour by children. These activities enable students under supervision to frequently practice traffic problem solving in context, which re-enforces lessons learnt as part of formal road safety education.

The Danish Council for Road Safety’s cycling obstacle course
Southern Region Of The Netherlands

Schools in the southern part of the Netherlands can apply to be part of a Verkeerseducatie road safety program. The local government funds the development and delivery of the program. A trained road safety educator from Verkeerseducatie works with the teachers for a number of days over a three year period. In the first year as the school is introduced to the programme, the trainer is heavily involved with staff education and implementation. Over the three year period the trainer provides professional development and organisational support to enable a gradual transition of responsibility to the school. By the third year, contact time with the trainer from Verkeerseducatie is reduced as teachers take over the program. Schools also receive a resource pack with road simulation equipment and teaching resources. Teachers develop specialised skills to deliver the intensive programme and are also in a position to reinforce the lessons learnt from this road safety education program.

Students participating in the Verkeerseducatie cycling and road safety programme in Hardinxveld, the Netherlands.
Prior to the week I participated in the delivery of this programme at a primary school in Hardenxveld, the instructor had visited the school and provided professional development to enable teachers to deliver the classroom theory component. I was able to observe parent volunteers, the Verkeerseducatie instructor and school teachers administer the practical skill sessions on school grounds and a neighboring street. Inclusion of parent volunteers was viewed as important not only for logistical support, but also to develop their capacity to re-enforce their child's learning beyond the school. Students were taken out of their normal school schedule for an hour long session to participate in the programme.

Students in the Netherlands are expected to undertake a cycling exam in traffic at the end of primary school, before they start riding unsupervised and further distances to attend high school. Traditionally police administered the traffic exam, although this has become less common.

**Cambridge, England**

Bikability is a well regarded, UK wide organisation offering training and a recognised qualification in cycle and road safety instruction. The training programme receives input from multiple stakeholders and is very well developed. Bikeability has broad support from cross-government agencies and is subsidised to deliver cycling and road safety education in schools. The breadth of its implementation throughout the UK has the potential to benefit the wider community. The programme has clear learning goals. Bikeability has examples of best practice activities that instructors may use. Instructors are able to modify and develop activities to best suit school and student needs. Modified activities undergo a review process with Bikeability prior to approval for use in schools.

Students participating in a Bikeability skills session in preparation for their on-road activity lesson in Cambridge England.

I observed Bikeability instructors taking a session at a primary school in Cambridge. In this case, the local government has contracted Bikeability to deliver the programme. Instructors received a hand over of duty of care for the students in line with the school's
procedures. Students were taken through a series of practical skill sessions on the school grounds. Upon completion of the session, duty of care was handed back to the school and the Bikeability instructors left. Teachers from this school did not participate in the delivery of the program. A teacher's aid was involved to supply additional support to a student with special needs.

Vienna, Austria; Velocity Conference

Velocity is an annual conference which strives to promote cycling participation. During my stay in Vienna, I was able to meet with cycling advocacy groups from Vienna Austria (Radlobby) and Switzerland (Defivelo) who provide cycling and road safety programmes in schools. These groups are funded both by government and private enterprise. They develop and deliver their own programmes which are practically based and include bicycle handling skills and maintenance. Instructors are usually volunteer members of the cycling advocacy group. Although these programmes are worthwhile, the small participant numbers limit their range of influence and potential benefit to the wider community.

Radlobby's Kinder Rad Spaß (Children's bike fun) cycling obstacle course in Vienna, Austria.

Bicycle maintenance workshop and cycling skill development games as part of Radlobby's Kinder Rad Spaß.
Safe Cycle: A School Based Cycling And Road Safety Programme In Canberra, Australia

Safe Cycle is a cycling and road safety programme developed in Canberra through funding from the ACT NRMA Road Safety Trust. Safe Cycle was originally written as a proof of concept for a school based cycling and road education programme. It was written to complement existing school curriculum and fit within established subject areas. Before Safe Cycle was approved for use in Canberra schools it was evaluated using current pedagogy standards (Quality Teaching Frameworks) and linked to the Australian Curriculum. Safe Cycle was evaluated to be compliant with Australian (and ACT) road rules and was considered by the Justice and Community Safety Directorate to deliver a suitable road safety message.

Safe Cycle is designed to support teachers by providing a cycling and road safety teaching resource that is easy to use\textsuperscript{17}. The ACT Health Directorate has surveyed teachers from pilot schools in the active travel initiative 'Ride or Walk to School' and found all schools consider it to be a 'really good quality resource' and are happy to continue using it. Developing school friendly resources makes it possible to draw upon teachers' expertise as instructors to deliver road safety education to children.

Implementation of the Safe Cycle programme is designed to be flexible. In high schools peer mentors could be used to provide logistical support in the delivery of practical sessions. Peer mentors as role models for younger students are very influential and could be used to encourage protective behaviour. It may be beneficial to re-engage the peer mentor with road safety education prior to commencement of driver training. Safe Cycle was written with the Canberra pre driver training programme 'Road Ready' in mind.

Safe Cycle's use in multiple schools across Canberra has demonstrated that it is possible for teachers to deliver cycling and road safety education in schools. Safe Cycle has been selected by the Transport and Road Safety research group from the University of NSW as a case study to evaluate the effectiveness of school based cycling and road safety education. Results from this study could provide direction to further develop this programme.

\textsuperscript{17} For further reading on effective teaching resources for school use, refer to; \textit{Traffic Safety Education Stakeholder Market Research}. Unpublished report for VicRoads. Referenced by Gayle Di Pietro & Ian Hughes (2005) Determining the optimal time for, and type of, road safety education in ACT schools. Study on behalf of VicRoads to determine which type and format of resources could be most effective for teaching and learning RSE in schools. Focus groups were held around Victoria with teachers and curriculum developers, and it was agreed that:

- Big kits that are broadly addressing road safety are not preferred. What is desirable is smaller, cross curricula thematic packages that target particular road safety issues.
- Any resource should include a variety of teaching and learning approaches.
- Video materials were highly valued.
- Re-producible worksheets were desirable.
- Games and simulations were interesting and fun and highly desirable.

Guidelines for selecting and using guest speakers, excursions and incursions, were thought to be of some value so that school based programmes were enhanced.
Road Simulation And On-road Training

Road safety education for children needs to be appropriate to their developmental stages. The question of whether traffic simulation should be included in a cycling and road safety programme is debated by professionals.

One of the arguments against traffic simulation includes concern that training children in an artificial environment could lead to an inflated sense of confidence which may be counter-productive outside the training environment.\(^\text{18}\)

Traffic Demonstration Centres

Traffic centres provide a safe environment for young children in particular to practice cycling skills. However traffic centre use by schools is in decline in Denmark and the Netherlands. Teachers I spoke to viewed them as fun place to go with students rather than a component of road safety education. This sentiment was repeated in discussions at Kennisplatform Verkeer en Vervoer (Knowledge Platform for Traffic and Transport) in Utrecht, the Netherlands. Traffic centre’s training methodologies are not aligned to current best practice in road safety education. Training programmes that extend over a longer time frame with detailed cycling instructions are seen as being more beneficial. The traffic centre, Trafiklegepladsen in Copenhagen, Demark runs programmes for children and provides bicycles and pedal cars. At the time I visited, it was not staffed but remained open to the public. A number of parents were there with young children cycling and riding scooters around the facility.

In Canberra, there used to be two traffic centres which were operated by the police. The last one closed in 2007. There is a sense of nostalgia held by some Canberrans who as children attended road safety education sessions at these centres. The arguments against traffic centres seem based on how they have traditionally been used. One single session does not adequately prepare children on the cusp of independent road cycling. This does not negate a demand for a safe space for children to practice cycling and road safety skills. A space designed for younger riders with a cycling course that develops transferable cycling and road safety skills would be preferable.

Traffic garden in Utrecht, the Netherlands and the Trafiklegepladsen in Copenhagen, Denmark.

\(^{18}\) Research conducted by the ARRB Group in Canberra
School Grounds Traffic Simulation

The Belgian professor Dr Jan Pauwels developed a series of cycling based practical activities that are designed to develop cyclists' skills required for safe cycling in traffic whilst not looking like traffic situations. Variations of these cycling activities appeared in many of the cycling and road safety programmes observed during my Churchill Fellowship. The premise is that transferable road safety skills can be learnt through activities that don't mimic traffic situations.

Drawing with chalk and using plastic cones to create mini-roads and simulating traffic situations is an important component of the Dutch Verkeerseducatie's practical session. This programme uses a mix of cycling games and traffic simulation. In comparison, the Bikeability session in Cambridge made a point of designing the layout on school grounds so as not to look like roads or traffic situations.

On-road Cycle Training

There are educational theories that learning is domain specific, ie children only put into practice what they learn at the location that they learn it. It could thus be argued that road safety education on the road has the potential to be more beneficial than traffic simulation situations.

Both the Verkeerseducatie programme from the Netherlands and Bikability from the UK include on road cycling training. The main difference is how soon in the programme the students are introduced to real traffic. The Dutch programme involves far more instruction on school grounds before taking children on the road. Both programmes instruct children of similar age (upper primary) and seek to provide situations for students to apply practical traffic problem solving skills.

Taking students into traffic involves risk. The Verkeerseducatie programme attempts to mitigate risk by keeping students away from hazards found in real traffic until they develop skills through simulation on school grounds. The Bikeability programme I observed placed more value on actual traffic situations over school ground simulations. Bikeability mitigated traffic hazards through risk management processes applied on the road.

Bikeability has set learning goals and includes examples of best practice activities, though allows instructors to devise their own tasks. The Bikeability programme in Cambridge includes on-road activities. Bikeability programmes in central London do not. There are schools in both the UK and the Netherlands that do not allow on road cycle training due to perceived risks in their area.

Areas with the highest perceived risk levels have the most to gain from on-road training. Instructional rides teaching children how to negotiate local traffic hazards are better than leaving children to work it out for themselves. Steps can be taken to reduce risk which include low student to supervision ratios, checkpoints at higher risk areas to assist students, traffic pacification through signage to notify drivers about the activity and police presence. Contextual on road training has merit when it can be safely included. Schools and instructors need to make this call based on their circumstances. When deciding how to introduce on-road training, the developmental stage and requirements of the students should be considered. In Canberra there is concern about inclusion of on-road cycling as a component of road safety education, and the ACT Education and Training Directorate

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19 From a practical point of view the generic designs from Bikeability allowed for a wider range of activities using the same course. Redrawing the traffic simulation designs on the school playground for each different activity created logistical problems. This in itself isn't a reason to dismiss traffic simulation, though it is worth considering when designing practical activities.
has mandatory procedures that include risk assessment for activities like this. Schools need to follow their Governing Body's procedures.

Inclusion of on-road training has merit and should be a target. In the absence of on-road training, simulated traffic situations provide a sense of context which is better than nothing. Regardless of which method is used, variety of how road safety skills are developed and repetition of their application is important.

A student taking part in the schoolverkeersexamen 'school cycle exam' Delft, the Netherlands.

Road simulation activities in Hardinxveld, the Netherlands. The 1/3rd scale pedestrian crossing was part of the cycling and road safety education kit provided to the school.
Cycling As A Component Of Broader Road Safety Education

An opinion that was presented by many road safety educators was that cycle safety training is a component of broader road safety education. Skills and protective behaviour development needs to change in accordance with the child’s progressive road use requirements. A simplified progression of road use is moving from pedestrian to cycling to motorised vehicle. Each stage of road safety education lays the foundation for the proceeding stages. The progression and transferal of road safety skills are at the heart of a holistic and life long approach to road safety education.  

Road safety educators believe that cycling and road safety programmes that develop traffic observation skills and protective behaviour patterns translate well to young driver training. Cycling is a form of ‘vehicular’ transport accessible to young adolescents. In many cases it is likely to be their first method of sustained independent road use. Cycling on road is similar to driving a motor vehicle in that it requires an ability to negotiate traffic and understand and apply road rules. Cycling can provide a focus for road safety which is accessible and meaningful to many young adolescents. Non-cycling adolescents can still benefit through exposure to concepts for personal road safety and protective behaviour modeling. Developing safe road use habits in pre-driving adolescence has the potential to transfer to beginning drivers skills.

In the report *How to Keep Children Safe in Traffic: Find the Daredevils Early* the authors suggest that children who will go on to be most at risk as young drivers can be identified from an early age. The Australian Temperament Project (ATP) Young Driver Study also supports the idea that problematic driver behaviour is detectable from early childhood. Encouraging protective behaviour in cycling and road safety education during early adolescence could benefit those most at risk of experiencing road trauma as drivers. How young adolescents respond during cycling and road safety programmes could indicate who might become high risk drivers. Identification of potential high risk drivers could enable early intervention through pre-driving road safety education programmes that focus on modifying behaviour associated with risky driving.

![Youth'] by Miguel Santos (Photograph used with permission from the photographer.)  This photo has captured adolescents enjoying a moment on their bikes.

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21 44% of surveyed Canberra students in years 5-8 indicated cycling was their preferred mode of transport to school. ACT Government Health Directorate, 2012 Ride or Walk to School programme survey
6. CONCLUSIONS AND RECOMMENDATIONS

1. Cycling Safety Needs To Be A Component Of Broader Australian Road Safety Education

Educational theory recognises that behaviour training is more effective when it is reinforced over a long period of time. Engaging children continually in developmentally appropriate road safety education from young childhood onwards is likely to obtain better results than widely separated short term intensive programmes. Assisting young adolescents to develop protective behaviour as they become independent road users could minimise development of unsafe road use behaviour.

Recommendation:
- To develop a holistic road safety education programme that incrementally progresses with the child's developmental stages and changing road use patterns. Include cycling education for its potential to support other aspects of road safety education.

2. Provide Safe Places That Are Specifically Designed For Young Children To Cycle

Basic bicycle handling skills and confidence is the beginning point for cycling road safety education. Bicycle handling skills can be learnt from a very young age. Children two years old are successfully using the Cykellegebanen (bicycle garden) and developing transferable road safety skills in Denmark. Providing spaces specifically for children of a young age to cycle is safer than using shared facilities.

Recommendation:
- Provide local, dedicated and safe cycling facilities specifically designed for use during early childhood.

3. Engage Parents In The Education Process

Parents' attitudes and behaviours have the potential to greatly influence their child's approach to road safety. Parents have capacity to instruct their child about safe road use in context. Parent support mechanisms could enhance parents' potential to positively role model road safety behaviour.

Providing an early childhood cycling facility would enable parents to engage with the development of their child's cycling skills. Additional information for parents about road safety education could be shared at this facility.

Recommendation:
- Use various channels to engage and instruct parents on how to positively contribute towards their child's road safety education. This may include engaging parents as helpers in their child's school based road education programmes, additional programmes specifically designed for parents and the production of information fact sheets for parents.

4. Frequent Reinforcement Of Road Safety Education Improves Retention Of Learning

Road safety education is considered more effective when it is embedded in regular school activities and lessons, as information is more likely to be retained. This is the current approach used in Danish cycle and road safety education.
Repetition of simulated skill development is required by schools who don’t use on-road cycling to encourage transfer of skills to context. A variety of cycling games allows for the development of cycling skills through play. Students learn effectively when they are stimulated and enjoy what they are doing.

Pedal Power (a Canberra based cycling advocacy group) have begun preparing cycling educational resources and professional development opportunities for teachers in Canberra.

1. Games Based Class Activities, a practical workshop for teachers wishing to run bike programmes within the school setting. Its aim is to assist teachers to implement engaging cycling activities; and
2. Managing the Mob, for teachers who wish to take students on excursions by bike.

Recommendations:
- To promote relationships between cycling organisations and schools.
- To support the development of strategies to embed cycling and road safety activities in schools.

5 Develop National Core Learning Outcomes For An Australian School Based Cycling And Road Safety Programme

The UK programme Bikeability, is an example of a national approach with clearly defined learning outcomes. Other programmes observed on this fellowship also contain learning outcomes that could translate well to an Australian program.

In Australia there are many organisations and people doing good work in isolation, however their efforts are not widely promoted or disseminated. A review of this work with the intention of developing a coordinated strategy would assist in the development of an effective and broadly used cycling and road safety education programme. Development of core learning outcomes for Australia is the first step. Additional learning outcomes to allow for differences of road rules and infrastructure in Australian states and territories would also be required.

Recommendation:
Designate an entity, whether a peak-body cycling advocacy group or government agency, to be responsible for the development of a school based cycling and road safety programme. Ideally this would include federal government agencies working with states and territories. The designated entity needs to involve stakeholders from cross-government agencies responsible for road safety, education, health and non-government organisations with experience in cycling and road safety to set learning outcomes and develop strategies for implementation in schools.

6 Provide Support To Teachers Who Deliver Road Safety Education

Pre-service teacher training does not include road safety education. Teachers involved in delivering road safety education acquire these skills after they begin working in schools. Even in countries where road safety education is a required part of the school curriculum, the scope of delivery depends on the engagement and interest of individual teachers. Providing teachers with mentors, professional learning opportunities and resources in road safety education increases their interest and engagement levels.

Recommendations:
- Provide teachers with meaningful professional learning opportunities in road safety education.
- Provide teaching resources in a format usable by schools.
- Further develop Australian school based cycling and road safety education programmes.
7 IMPLEMENTATION AND DISSEMINATION OF FINDINGS

- I have been asked by the ACT Health Directorate to deliver a professional learning session for teachers of schools who are part of the pilot active travel programme "Ride or Walk to School".

- I will be further developing Safe Cycle, a cycling and road safety teaching resource.

- I will be delivering a "Train the Trainer" session: professional learning run by Canberra Off-Road Cyclists for teachers who are new to supervising school cycling activities.

- The Transport and Road Safety Research Group from the University of NSW has begun a case study of Safe Cycle in Canberra schools. Over the next 2 years I will continue my involvement in this research project.

- I will jointly run a lunch time, school based cycling club at Melba Copland Secondary School in Canberra called Bike Cafe. Bike Cafe is based on programmes I heard about in Denmark. Students are invited to bring their bikes in for basic maintenance and to participate in fun cycling games.

Students from Melba Copland Secondary School participating in a Safe Cycle practical skills lesson in Canberra, Australia.