**EVALUATION OF THE**

**ROAD AWARE PARENTS AND KIDS PROGRAMS**

**SUMMARY REPORT FOR ROAD SAFETY COUNCIL**

**PREPARED BY THE OFFICE OF ROAD SAFETY AND  
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# Executive summary

### Background

In Western Australia, road-related trauma is the greatest specific cause of injury and fatality for children aged 0-12 years [[1](#_ENREF_1)]. Between 2006 and 2010, 71 children aged 0-16 years were killed and 1,054 were seriously injured on Western Australian roads. Children are considered vulnerable road users due to their developing cognitive and perceptual abilities; consequently their road safety skills and knowledge also change considerably over time with increased exposure and experience [[2](#_ENREF_2)].

As a vulnerable and high risk group, children and young people remain a key target group in the *Towards Zero Road Safety Strategy 2008-2020* as they are frequent users of the road and transport system in WA, as pedestrians, cyclists, drivers and increasingly scooter riders [[2](#_ENREF_2)].

School Drug Education and Road Aware’s (SDERA) response to the WA context has been to promote road safety education as a priority health issue for young people and to facilitate the implementation of road safety by enhancing teacher capacity (professional development) and providing quality road safety education resources (curriculum support materials K-12). The support SDERA provides is extended to all schools (government and non-government) through a state wide regional consultancy service.

Road Aware is a comprehensive road safety education program that targets children and young people from birth to 20 years of age, and comprises of three projects:

1. **Road Aware Parents** targets parents and carers of children aged from birth to 4 years. This program commences a child’s road safety education at a critical point in a child’s learning and provides the foundations for positive and compliant road use.

2. **Road Aware Kids** targets children aged from 4 to 14 years of age, and their parents and carers. This program further develops road safety skills, understandings and attitudes.

3. **Road Aware Drivers** targets children from 15 to 20 years, and their parents and carers. This program aims to prepare young people for a lifetime of safer driving.

An Evaluation of the Road Aware Parents and Kids Programs commenced in 2004. The series of baseline and follow up surveys were designed to provide a combined process and impact evaluation. Specifically the evaluation was intended to monitor:

* program progress and success,
* the extent to which the programs generated lasting and sustainable partnerships that would reduce road trauma outcomes in young people;
* program reach and impact;
* changes in the knowledge, attitudes, or behaviour of the program target groups and;
* (to a lesser extent) whether the programs were being delivered correctly and in an effective manner.

The overall study design of this evaluation of the Road Aware Programs was a randomised, cross-sectional (three time points) and cohort study, designed to measure the impact of the *Road Aware Parents* and *Road Aware Kids* programs on the knowledge, attitudes, and behaviours of parents’, teachers’, children’s, and *Road Aware Parents* delivery agency staff.

This independent evaluation was designed to answer two key objectives:

1. To measure the impact of the *Road Aware Parents Program* on knowledge, attitudes and behaviours of parents of children aged 0-8 years (as the primary response group);

2. To measure the impact of the *Road Aware Kids* program on knowledge, attitudes and behaviours of children aged 9–11 years and 12-14 years.

Data was collected at three time points represented by Baseline, Phase Two (one year post implementation) and Phase Three (two years post implementation). Limitations of the study design are discussed in section 3.0.

### Findings

**Reach of the Road Aware Parents Program:**

All stakeholder representatives surveyed indicated their organisation integrated the distribution of *Smart Steps* resources as part of their core business and therefore promoted Smart Steps messages in their day-to-day activities.

Over half (60%) of parents surveyed at each of the Road Aware Parents delivery agencies were aware of the *Smart Steps* program and obtained most of their information from Meerilinga, Ngala and Playgroup WA. Most had seen program resources and some reported attending a parent workshop. Each of the *Smart Steps* resources, when seen by parents was predominantly rated as ‘*useful’* or ‘*very useful’*.

**Reach of the Road Aware Kids Program:**

Awareness of the Road Aware Kids Program resources two years after their state-wide dissemination was generally quite low for most of the year levels (Kindergarten: 38%, Year 2: 30%, Year 5: 30% and Year 8: 65%).

Of those teachers who had seen, read and implemented the resources most reported they were ‘*very useful’* or ‘*useful*’ and most would use them again.

The teachers who used the resources reported they taught all the available focus areas, however, Year 8 teachers reported greater confidence and skills to teach students road safety than did primary school teachers.

Approximately one half of Year 5 and 8 students reported teachers had talked with them about road safety (less for Year 8 students at Phase Three). Most commonly Year 5 students reported teachers talked with them about wearing seatbelts, making safe decisions around traffic and checking for moving cars at driveways. Year 8 students reported teachers primarily discussing strategies to avoid travelling with a driver who had been drinking, factors contributing to and the consequences of road crashes.

The positive significant changes found between Baseline and Phase Three surveys are indicated below:

**Table 1**

|  |  |  |
| --- | --- | --- |
|  | **Road Aware Parents Program** | **Road Aware Kids Program** |
| **Changes in knowledge** | × Parental understanding re age required to assist crossing a road.  √ Parental knowledge of children’s physical and cognitive limitations in the road environment. | √ Year 8 overall pedestrian knowledge.  √ Year 8 knowledge of riding safety.  √ Primary school teachers summed knowledge score. |
| **Changes in attitudes** | √ Parental belief they could prevent their child from being injured near the road.  √ Parental attitudes relating to general road safety behaviours. | √ Year 5 students’ beliefs regarding how they could make themselves safer on and around roads.  √ Year 8 students’ safe driving attitudes. |
| **Changes in behaviour** | √ Parental self-reported behaviours relating to walking with their child, showing them how to cross a road and explaining safe road crossing behaviours.  √ Talking with and showing child how to practise safe passenger behaviours.  √ Parents were more skilled at checking a child car restraint. | √ Year 5 use of 1 of the 10 recommended road crossing steps.  √ Year 8 use of 5 of the 10 recommended road crossing steps.  √ Year 8 checking for moving cars at driveways and intersections and chose safer places to ride, skate, scoot or blade.  √ Year 8 reporting safer intended driving behaviours.  √ Year 8 teachers had heard or read about school’s road safety guidelines and procedures. |
| **Changes in self efficacy** | √ Parents confidence to show, teach and practise road safety.  √ confidence to choose, restrain and change a child restraint (0-2’s only) |  |

√ Indicates a significant positive change (p<0.05) over time

As demonstrated above it is quite likely that the significant positive changes detected can in part be attributable to implementation of the Road Aware Parents and Kids programs. Improvements have been seen over time in knowledge, attitudinal, behavioural and self efficacy related constructs across parent, student and teacher target groups.

On the basis of these findings, the following recommendations are made:

*Recommendation 1*

*SDERA dedicate specific resource capacity to undertake a marketing plan aimed at communicating with target audiences about support services and resources available.*

*Recommendation 2*

*SDERA use a direct mail approach to communicate with past participants of workshops to continue their engagement and utilise their networks to market SDERA products and services.*

*Recommendation 3*

*SDERA maintain the practice of using Service Agreements with partner agencies as appropriate to establish commitment to the delivery of community based road safety education.*

*Recommendation 4*

*SDERA adopt a more targeted approach to the dissemination of support materials by using an “opt in” strategy.*

*Recommendation 5*

*SDERA to maintain workforce capacity building strategies through the provision professional development, training and the provision of current curriculum support materials.*

*Recommendation 6*

*SDERA encourages school based road safety activity by implementing a grant scheme that facilitates localised initiatives in the school and community settings.*

*Recommendation 7*

*SDERA engages schools in a whole school approach to road safety education by obtaining commitment to documenting action in the areas of curriculum, community and parent involvement and the development of policy and guidelines.*

*Recommendation 8*

*The lead education agencies represented on the SDERA Steering Committee commit to advocacy strategies that promote SDERA’s lead role in road safety education and the importance of the adoption of road safety education in the school curriculum*

*Recommendation 9*

*SDERA maintain a scheduled program of resource review to ensure support materials align with current evidence of best practice.*

*Recommendation 10*

*SDERA explore the use of interactive web based strategies to engage teachers, parents and students in road safety education with a focus on user accessibility, ease of navigation and interactivity.*

Of the available evidence, most intervention studies have reported modest changes in students and parents’ knowledge, attitudes and behaviours. What most systematic reviews and road safety position papers point to however is the importance of school-based road safety education to support other environment and enforcement strategies.

1.0 Background

## 1.1 Context for road safety education in schools in WA

In Western Australia, road-related trauma is the greatest specific cause of injury and fatality for children aged 0-12 years [[1](#_ENREF_1), [3-6](#_ENREF_3)]. Between 2006 and 2010, 71 children aged 0-16 years were killed and 1,054 were seriously injured on Western Australian roads. Further, almost one third of all vehicle occupant fatalities aged between 0-16 years in Western Australia were not wearing a restraint. In 2010, 13 Western Australian children aged between 0-16 years died as a result of a road crash, representing 7% of all road crash fatalities in Western Australia (C. Thompson, personal communication, September 20, 2012).

Children are considered vulnerable road users due to their developing cognitive and perceptual abilities; consequently their road safety skills and knowledge also change considerably over time with increased exposure and experience. Road use behaviours of children and youth aged 0-16 include being a passenger, pedestrian, cyclist and user of small wheeled methods of transportation - like skateboards and scooters [[2](#_ENREF_2)].

As pedestrians, children under the age of 10 do not have the cognitive and perceptual skills to navigate roads without adult supervision [[2](#_ENREF_2)]. In Western Australia from 2006-2010 of those children (0-16 years) killed or seriously injured in road crashes 14% of those aged 0-4 years and 13% of those aged 5–17 years were pedestrians (C. Thompson, personal communication, September 20, 2012).

The majority of cycling injuries occur when a child falls off his/her bike on a public road, with approximately 40% of all cyclist deaths in Western Australia occurring in those under the age of 20 [[2](#_ENREF_2), [7](#_ENREF_7)]. The Australian Institute of Health and Welfare (2008) [[7](#_ENREF_7)] reported that of the child cyclists who were seriously injured, approximately 6% were aged 4 or under and 94% were 5–17 years old.

The Organisation for Economic Co-operation and Development (OECD) sanction the role that education plays in reducing mortality and morbidity as a result of road trauma [[8](#_ENREF_8)]. International research also suggests that parents of 0-4 year old children are the most appropriate providers of road-safety education for their children [[9-12](#_ENREF_9)] however, many parents are unaware of and unskilled in knowing how best to provide this learning [[13](#_ENREF_13)]. Therefore, without adequate awareness, knowledge and skills, parents cannot deliver effective road safety training to their children.

Road safety education of youth is also facilitated through school by utilising a whole school approach [[14](#_ENREF_14)]. Collaboration between the school, students, parents and the community enables multiple opportunities for consistent road safety messages to be delivered to youth, reinforcing appropriate road safety behaviour [[14](#_ENREF_14)]. School-based road safety education also allows educational messages to be delivered in accordance with a child’s cognitive and perceptual development, with a focus toward enhancing one’s understanding of road traffic, the environment and perception towards individual safety and that of others [[14](#_ENREF_14)].

Effective school-based road safety education provides the greatest opportunity for attaining sustained improvement in behaviour change and a reduction in road morbidity and mortality for Australia’s youth and as they approach adulthood [[15](#_ENREF_15)]. However, there is a lack of international empirical evidence to suggest that a whole school approach toward road safety education will be effective in reducing road trauma of youth [[14](#_ENREF_14)]. There are also very few rigorously evaluated Australian parent education programs which is problematic for the development of an evidenced-based road safety intervention such as the *Road Aware Program*. Consequently, this current evaluation is important from a local, state, national and international perspective to indicate the effectiveness of a whole school approach toward road safety.

In the Western Australian (WA) school curriculum context road safety education is positioned most commonly in the Health and Physical Education (HPE) learning area. It is also accurate to say that in the development of the HPE component of the National Curriculum, road safety education will be similarly situated. While the HPE learning area is a compulsory component of all schools’ curriculum offering, the prioritising of health education content, for example, road safety is a school based decision. In reality road safety education competes for curriculum space with a host of wider education priorities such as literacy and numeracy and specific health education priorities such as drug education, nutrition education and sexual health.

School Drug Education and Road Aware’s (SDERA) response to the WA context has been to promote road safety education as a priority health issue for young people and to facilitate the implementation of road safety by enhancing teacher capacity (professional development) and providing quality road safety education resources (curriculum support materials K-12). The support SDERA provides is extended to all schools (government and non-government) through a state wide regional consultancy service.

The school setting is the preferred site for many health related programs but equally it is recognised that in the early years of development, young children are vulnerable to a range of health risks, notably the harms arising from road use as car passengers and pedestrians. In this regard parents are a key target group for keeping their children safer on the roads. Formative research conducted by Edith Cowan University (ECU) informed SDERA in the development of a program to target the parents of children in the 0-4 years age group. Partnerships have been formed with 4 key parent support agencies; Meerilinga Children’s Foundation, Kidsafe WA, Playgroup WA and Ngala. With continued consultancy and resource support from SDERA, the agencies have integrated key road safety messages into their parent education programs thereby informing a critical audience about keeping children safe in vehicles and on the road.

It should be noted that there exists a range of government and non-government agencies that have a stake in road safety education for young people and in turn provide information, resources and presentations as part of their service. Recognising the need for consistency and coordination SDERA undertook (post 2002) the lead in 2 key initiatives:

* The development of *Principles for road safety education*. Extensive research and national consultation by ECU produced a set of principles that articulate best practice in road safety education. The principles provide guidance for program development, implementation and evaluation. The *Principles for road safety education* have been adopted nationally by key road safety education organisations.
* The establishment of a state road safety education coordinating group (*Road Safety Education Committee)* comprising of key stakeholder agencies that provide education services to schools and young people. The collaboration engendered through the RSEC has facilitated a coordinated approach to road safety education in WA that avoids duplication of effort and resources and promotes a high quality service.

## 1.2 History and context for SDERA

In 2000, the Road Safety Council commissioned a review of national and international road safety practices and initiatives *- Review of Good Practice:*

*Children and Road Safety Education* [[10](#_ENREF_10)]. The review made recommendations for the development of a comprehensive road safety education program for children and young Western Australians.

In brief, the recommendations were:

* More funding is required for road safety education (RSE) given the expanded priorities and directions.
* A new approach to school-based RSE is recommended with a clearer more limited focus and new delivery system for teacher professional development and support.
* A new, Year 10 subject is recommended to replace all secondary RSE and this will have substantial cost element mostly associated with its introduction.
* Parents are a new target and a delivery mechanism for reaching them will be needed.
* A more ‘regional’ approach is likely to result in greater gains, especially given the over-representation of rural children in road deaths and injuries.

An extensive consultation process with stakeholder groups led to the development of a policy document titled *Road Safety Policy for Infants, Children and Young People in Western Australia*. The Minister for Police and Emergency Services endorsed the policy in 2002 and the Road Aware Program (Road Aware) was subsequently launched in September 2002.

The Road Aware Program consists of three overlapping projects, Road Aware Parents (RAP), Road Aware Kids (RAK) and Road Aware Drivers (RAD). Road Aware was charged with achieving a number of outputs in road safety education for the 0-20 year. These outputs addressed the recommendations contained in the report *- Review of Good Practice: Children and Road Safety Education*; they were:

* Development of curriculum support materials and resources
* Professional development for teachers
* School, parent and community engagement
* Maintenance of monitoring and reporting
* Development of principles and guidelines for schools

In seeking to align Road Aware’s mission with existing initiatives, the WA School Drug Education Project (SDEP) was identified as having successful strategies to access teachers and deliver professional development on a state wide basis. The SDEP network of Regional Organising Committees, spread throughout all regions of Western Australia, was seen to be a highly effective model of comprehensive planning and implementation for a health education intervention within the Western Australian context.

In 2003, a strategic alliance between SDEP and Road Aware was formed. The alliance resulted in the two projects becoming one organisation, *School Drug Education and Road Aware (SDERA)*, sharing management, administrative, business planning and evaluation processes. The strategic alliance was a unique and deliberate approach taken by the State Government towards coordinating drug and road safety education efforts for young people in Western Australia.

Currently SDERA has regional consultants located in the major regional centres of WA supported by a metropolitan team. SDERA continues to provide support to schools by increasing the capacity of teachers to engage in road safety education and by helping connect schools and parents to community support agencies. The work of the SDERA team has evolved to include partnership development, participation in research alliances and the development of strategic networks with road safety groups throughout Australia.

## 1.3 Road Aware Parents and Kids Program Description and Objectives

As a vulnerable and high risk group, children and young people remain a key target group in the *Towards Zero Road Safety Strategy 2008-2020* as they are frequent users of the road and transport system in WA, as pedestrians, cyclists, drivers and increasingly scooter riders.

Road Aware is a comprehensive road safety education program that targets children and young people from birth to 20 years of age, and comprises of three projects:

1. **Road Aware Parents** targets parents and carers of children aged from birth to 4 years.

2. **Road Aware Kids** targets children aged from 4 to 14 years of age, and their parents and carers.

3. **Road Aware Drivers** targets children from 15 to 20 years, and their parents and carers.

### Road Aware Parents

The Road Aware Parents (RAP) component ensures that effective road safety education is provided to parents and carers of children aged from birth to 4 years through the *Smart Steps* program. This program commences a child’s road safety education at a critical point in a child’s learning and provides the foundations for positive and compliant road use.

Objectives of RAP are as follows:

### Children

* Develop safer road user skills and self management in young children particularly as passengers, pedestrians, cyclists and riders of other wheeled recreational devices.
* Develop positive attitudes in young children towards safer road user practices as passengers, pedestrians, cyclists and riders of other wheeled recreational devices.
* Increase young children’s compliance with safe road user practices as passengers, pedestrians, cyclists and riders of other wheeled recreational devices.

### Parents

* Increase parents’ knowledge and understanding of road safety issues and safer road user practices for young children.
* Increase parents’ awareness of their role as models in demonstrating safer road user behaviour and practices.
* Increase the number of appropriate road safety messages disseminated to young children by parents.
* Increase parents’ level of involvement in demonstrating and practising safe road user behaviour for children, particularly at the road side.
* Develop positive attitudes in parents towards safe road user practices for young children.

### Road Aware Kids

The Road Aware Kids (RAK) component ensures that effective road safety education is provided to children aged from 4 to 14 years through the *Challenges and Choices* program. This program further develops the road safety skills, understandings and attitudes that were a focus of *Smart Steps*.

Objectives of RAK are as follows:

### Children

* Increase children’s knowledge and understanding of safer road user practices as pedestrians, passengers, cyclists and riders of other wheeled recreational devices.
* Improve children’s self management and interpersonal skills for safer road use.
* Increase children’s intention to behave safely as pedestrians, passengers, cyclists and riders of other wheeled recreational devices.
* Develop positive attitudes in children towards safer road user practices as pedestrians, passengers, cyclists and riders of other wheeled recreational devices.

### Parents

* Increase parents’ knowledge and understanding of road safety issues and safer road user practices for children.
* Increase parents’ awareness of their role as models in demonstrating safer road user behaviour and practices.
* Increase the number of appropriate road safety messages disseminated to children by parents.
* Increase parents’ level of involvement in demonstrating and practising safe road user behaviour for children particularly at the road side.
* Develop positive attitudes in parents towards safe road user practices for children.

## 1.4 Context for the Evaluation of the Road Aware Parents and Kids Program and the Evaluation Objectives

Prior to the full implementation of the Road Aware Parents and Road Aware Kids programs, the Office of Road Safety (ORS) identified the need to prepare for the evaluation of these programs. A tender for the collection of baseline data was issued in 2004 with the successful contractor being the Child Health Promotion Research Centre (CHPRC) at Edith Cowan University (ECU). This contract included the collection of behavioural, and attitudinal data providing a series of baseline measures against which future data collections could be compared. The collection of baseline data commenced in 2004, despite program materials being incomplete, hence some measures were developed without reference to relevant program components.

In 2005, a second tender was issued by the ORS to conduct two series of follow-up surveys (Phase Two and Phase Three), again the CHPRC at ECU was the successful tenderer.

The series of baseline and follow up surveys were designed to provide a combined process and impact evaluation. Specifically the evaluation was intended to monitor:

* program progress and success,
* the extent to which the programs generated lasting and sustainable partnerships that would reduce road trauma outcomes in young people;
* program reach and impact;
* changes in the knowledge, attitudes, or behaviour of the program target groups and;
* (to a lesser extent) whether the programs were being delivered correctly and in an effective manner.

## 1.5 Reference to Similar Evaluation Studies

Internationally, countries demonstrating coordinated efforts of education, training and publicity for road safety report road-related morbidity and mortality rates almost half those of countries without such a Public Health approach to road safety [[16](#_ENREF_16)]. Global ‘best practice’ in school-based road safety education is said to involve curriculum embedded in National curriculum frameworks, supported by public education campaigns increasing drivers awareness of younger road users coupled with environmental change and enforcement [[16](#_ENREF_16)]. Yet despite these recommendations, very few evidence-based curriculum and whole school resources exist which have evidence of immediate and long lasting intervention effects on the knowledge, attitudes and behaviours of young people.

Within the empirical literature reporting evaluations of school-based road safety education, most findings are equivocal. That is, some report positive changes in student outcomes over time but most find minimal or no impact. Importantly however, very few published studies reported unintended harmful outcomes of implementing road safety education in schools.

Using recent systematic reviews of empirical studies reported in the academic literature, some studies found positive changes in behaviour, however more demonstrated changes in students’ knowledge, attitudes or awareness of road safety skills [[17](#_ENREF_17), [18](#_ENREF_18)]. These changes were often in only one domain of behaviour or knowledge and were only small changes relative to children receiving the ‘control’ intervention and none established long term effects. Further compounding these small effects are issues relating to students relatively high levels of road safety knowledge before interventions are implemented, rendering intervention effects on knowledge difficult or when they are achieved, relatively small [[19](#_ENREF_19)].

The interventions which appeared to influence behaviour were typically grounded in theory [[18](#_ENREF_18), [20](#_ENREF_20), [21](#_ENREF_21)], had sound methodological frameworks for the evaluation [[17](#_ENREF_17), [18](#_ENREF_18), [20](#_ENREF_20)] and used practical, simulated or on-road training [[19](#_ENREF_19), [22-31](#_ENREF_22)] and reflective learning strategies [[19](#_ENREF_19), [32](#_ENREF_32)] for engaging young people.

Relatively few empirical studies describe the uptake of the resources by teachers (program reach) as most road safety interventions which have been tested empirically in experimental trials are delivered or closely monitored by the research team, hence achieving an almost 100% reach to students. However even in these controlled environments, teacher implementation of curriculum materials remains variable. In the CHPRC’s previous randomised comparison trials of road safety curriculum in primary schools, teacher implementation rates were as high as 90% among Kindergarten teachers and declined as the age of students increased (84% Year 2 teachers; 75% Year 3 teachers; 59% Year 4 teachers) [[33](#_ENREF_33), [34](#_ENREF_34)]. In a process evaluation of the Challenges and Choices predecessor, the WA School Road Safety Project, of the 88 early childhood and 60 Year 4 and 6 teachers who responded to the survey, around half had not seen or implemented the resources [[35](#_ENREF_35)].

These findings do not mean that school-based road safety education is ineffective. Rather, it points to the methodological difficulties in implementing and evaluating road safety education in schools [[36](#_ENREF_36), [37](#_ENREF_37)]. This point is elaborated in most recent reviews of road safety education in schools which call for greater emphasis on interventions grounded in behaviour change theory and pedagogy [[38](#_ENREF_38)], that are practical and provide real word training opportunities [[16](#_ENREF_16), [38](#_ENREF_38)], involve parents [[16](#_ENREF_16), [38](#_ENREF_38)], are ongoing [[16](#_ENREF_16)] and have exemplar research methodologies to enable accurate evaluation of a program’s success and track changes in young people’s outcomes over time [[36](#_ENREF_36), [37](#_ENREF_37)].

Education is an important part of any public health program. It cannot stand alone but cannot be ignored either [[39](#_ENREF_39)]. While limited evidence for the effectiveness of road safety education exists, there is some support that knowledge and in some cases behaviour can be influenced by classroom-based resources, however the transition from knowledge acquisition to behaviour change on roads remains largely unverified. Further, implementation of road safety resources in schools is also problematic, however WA evidence indicates that dedicated commitment to road safety education, attendance at training workshops and monitoring and ongoing support for teachers who are trained can influence implementation rates.

# 2.0 Methods / Analysis

The overall study design of this evaluation of the Road Aware Programs is a randomised, cross-sectional (three time points) and cohort study, designed to measure the impact of the *Road Aware Parents* and *Road Aware Kids* programs on the knowledge, attitudes, and behaviours of parents’, teachers’, children’s, and *Road Aware Parents* delivery agency staff.

This independent evaluation was designed to answer two key objectives:

1. To Measure the impact of the *Road Aware Parents Program* on knowledge, attitudes and behaviours of parents of children aged 0-8 years (as the primary response group);

2. To Measure the impact of the *Road Aware Kids* program on knowledge, attitudes and behaviours of children aged 9–11 years and 12-14 years.

### Study design

Data was collected at three time points represented by Baseline, Phase Two (one year post implementation) and Phase Three (two years post implementation). This study design accommodates the collection of diagnostic (process) data to monitor the amount of the *Road Aware Program* (dose) provided to participants over time and to inform the development and refinement of the program as well as participant satisfaction with the program components.

The *Road Aware Program* comprises two individual but overlapping program initiatives; *Road Aware Parents* and *Road Aware Kids*. As the evaluation of these two programs in some instances required collecting data from the same age respondents, the CHPRC implemented a sub-study design whereby data could be collected from children and their parents for more than one program simultaneously (e.g. parents of 3-5 year olds could provide information for the *Road Aware Parents* program as well as the *Road Aware Kids* program). Moreover, data were also collected from people responsible for the delivery of the Road Aware Programs.

### Participant recruitment

Random recruitment of primary and secondary schools occurred one year after *Challenges and Choices* and the *Smart Steps* programs (resources comprising the *Road Aware Kids and Road Aware Parents* *Programs*) were implemented in schools. Thereafter, teachers and students were invited to participate in the evaluation following CHPRC consent methodologies and self complete surveys were administered during class time to teachers and students. The Survey Research Centre at Edith Cowan University were sub-contracted to recruit parent respondents for this study. Using random digit dialling, parents of 6-8 (Year 2) and 3-5 year olds (Kindergarten students) were recruited into the study to answer on behalf of their children (who were too young to complete self-administered questionnaires). Random digit dialling was also utilised to recruit parents of 0-8 year olds who may have been exposed to the *Road Aware Parents* program.

**Table 2**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Cluster** | **Primary respondent** | | **Secondary respondent** | |
| **Respondent** | **Method** | **Respondent** | **Method** |
| **0 – 2 year olds** | Parents | Telephone interview | CCR Fitters | Self-complete surveys |
| **3 – 5 year olds** | Parents | Telephone interview | Kindergarten Teachers | Self-complete surveys |
| **6 – 8 year olds** | Parents | Telephone interview | Year 2  Teachers | Self-complete surveys |
| **9 – 11 year olds** | Students | Self-complete surveys | Year 5  Teachers | Self-complete surveys |
| **12 – 14 year olds** | Students | Self-complete surveys | Year 8  Teachers | Self-complete surveys |

### Baseline Participant Numbers

* A total of **1,200** **parents** of 0-8 year old children living in Western Australia were interviewed by telephone following random digit dialling.
* A total of **101 primary** and **107** **secondary** **school teachers** from 27 primary and 38 secondary schools completed a questionnaire which was mailed to their school.
* A total of **267** **primary** and **539** **secondary school students** from 11 primary and 12 secondary schools across Western Australia completed a student questionnaire.

### Phase Two Participant Numbers

* A total of **1,216** **parents** of 0-8 year old children living in Western Australia were interviewed by telephone following random digit dialling.
* A total of **28 primary** and **30** **secondary** **school teachers** from 13 schools throughout Western Australia completed a questionnaire
* A total of **57** **primary** and **558** **secondary school students** from 4 primary and 10 secondary schools across Western Australia completed a student questionnaire.

### Phase Three Participant Numbers

* Cohort parents from Phase Two were followed up and a total of **909** **parents** of 0-8 year old children living in Western Australia were interviewed by telephone. All parent responses were collected by research assistants.
* A total of **84 primary** and **34** **secondary** **school teachers** from 24 primary and 18 secondary schools throughout Western Australia completed a questionnaire.
* A total of **406** **primary** and **478** **secondary school students** from 11 primary and 13 secondary schools across Western Australia completed a student questionnaire.

### Data Analyses

All teacher, parent and student data were entered into SPSS and, using the CHPRC data cleaning protocol, were cleaned to remove data entry errors. Frequencies of all teacher, parent and student responses were produced and reported. Where appropriate, an index score or scale mean was computed and comparisons by key moderator variables (gender, age, years of teaching etc) were made and reported only where statistically significant differences were found based on chi-square tests and one-way ANOVA’s.

To determine the impact of the *Road Aware Program* on students, a school dose measure was calculated for passenger, pedestrian, cyclist and driver outcomes. An overall dose measure was calculated from student report of whether teachers had talked to their class about road safety that year. Impact analyses were conducted for Phase Three Year 5 students and for Phase Two and Phase Three Year 8 students using Multilevel statistical modeling. Models accounted for gender, SEIFA (Socio-Economic Index), region (metropolitan or country) and school type (Government and non-Government), and clustering at the school level. Multilevel regression models were used to test the impact of dose on knowledge scores, while multilevel logistic regression models were used to test the impact of dose on behaviours, attitudes and self-efficacy.

# 3.0 Limitations

While the overall findings of this evaluation represent a thorough review of *Road Aware Parents* and *Road Aware Kids* programs, several limitations exist which must be considered when interpreting the study’s findings.

1. This report has conservatively reported only statistically significant changes over time in respondent knowledge, attitudes, self efficacy and behaviour. Therefore, while many positive trends in changes in respondent outcomes over time were found, if not statistically significant these have not been highlighted in this brief report.
2. **Study Design:** The study design was cross-sectional in nature therefore, while changes in respondents’ knowledge, attitudes, behaviours and self efficacy over time may be observed, it is not possible to conclude with certainty that these changes are attributable to the *Road Aware* *Programs* as the samples were different at each time point. Further, due to budget limitations there was no comparison group comprising students, teachers and parents with no exposure to the program.
3. **Timing:**Due to the timing of the Office of Road Safety’s funding of the evaluation of the *Road Aware Programs*, and the actual implementation of the programs, the Baseline data for *Road Aware Parents* and *Road Aware Kids* *Program*s occurred in 2004 while the first of the *Road Aware Programs* wasn’t implemented until Term 2 2006 and the last commenced implementation in Term 1 2008. Therefore, after waiting one year after each program had been implemented to collect Phase Two impact analyses, a gap of at least three, and in some cases six years exists between the Baseline and Phase Two data which introduces threats to the external validity of the study findings. All Phase Three data were collected one year after Phase Two data.
4. **Program Implementation:** Due to the diffused dissemination of the *Challenges and Choices* resources, it was not possible to link teacher report of use of the materials to individual student outcomes. Therefore, students were asked to report how often teachers talked with them about road safety (regardless of the source of the information) and this was used to calculate student dose.

# 4.0 Results summarised by program

## 4.1 Program reach

### Smart Steps Delivery Agency Use and Satisfaction

All respondents indicated their organisation integrated the distribution of *Smart Steps* resources as part of their core business and therefore promoted Smart Steps messages in their day-to-day activities. The delivery of *Smart Steps* comprised planned and unplanned presentations and informal chat sessions (such as coffee mornings) to day care centres, community groups and parents; and more formally to students at schools. Many delivery agencies reported the *Smart Steps* Parent Booklet and the *Child Car Restraint* Brochures were easy to use and a good way to start a conversation with parents about road safety. The DVD and particularly the workshops were the least well used and liked by delivery agencies as many felt parents were not interested in attending a workshop solely dedicated to road safety. Instead some delivery agencies used the workshop information during coffee mornings and other informal chats with parents. Respondents also enjoyed using the mascot ‘Izzy’ to positively influence the reach and delivery capacity of *Smart Steps* resources.

### Implementation of Smart Steps

To gauge parents’ awareness, use and satisfaction of the *Road Aware Smart Steps* program, parents attending the organisations implementing the program were asked to complete a brief survey. Over half of responding parents (60%, n=69) were aware of the *Smart Steps* program and obtained most of their information from Meerilinga, Ngala and Playgroup WA. These parents indicated they had seen the child car restraint brochures, *Smart Steps* parent booklet and other components of the resource kit (CD, safety door sticker etc). One half of the responding parents reported attending a parent workshop which received the highest ‘usefulness’ rating. Each of the *Smart Steps* resources, when seen by parents was predominantly rated as ‘useful’ or ‘very useful’.

While satisfaction with the *Smart Steps* resources was high among parents receiving the materials, the sample primarily comprised parents attending Playgroup, Meerilinga and Ngala. The delivery of information to all parents of children in these age groups in Western Australia needs to be enhanced and is discussed further in the recommendations of this report.

### Implementation of Road Aware Kids

Year 8 teachers were most familiar with the Road Aware Kids resources while many teachers of Kindergarten (Phase Two: 60%; Phase Three: 62%), Year 2 (Phase Two: 57%; Phase Three: 70%) and Year 5 (Phase Two: 73%; Phase Three: 70%) had not seen the resources one and two years after their state-wide dissemination. Of those teachers who had seen, read and implemented the resources most reported they were ‘*very useful’* or ‘*useful*’ and most would use them again. The teachers who used the resources reported they taught all the available focus areas however Year 8 teachers reported greater confidence and skills to teach students road safety than did primary school teachers.

Approximately one half of Year 5 and 8 students reported teachers had talked with them about road safety (less for Year 8 students at Phase Three). Most commonly Year 5 students reported teachers talked with them about wearing seatbelts, making safe decisions around traffic and checking for moving cars at driveways. Year 8 students reported teachers primarily discussing strategies to avoid travelling with a driver who had been drinking, factors contributing to and the consequences of road crashes.

## 4.2 Trends in high level constructs

### Road Aware Parents

### Changes in parental knowledge

While parental knowledge across all age groups surveyed (Parents of 0-2 and 3-5 year olds) was relatively low, it did increase slightly but not significantly over time. The greatest improvement in overall knowledge was at Phase Two for both cohorts of parents. The improvement in parental knowledge found from Baseline to Phase Three was related to knowledge of children’s physical and cognitive limitations in the road environment. Significant decreases over time were found in both cohorts for parents understanding they should insist on holding their child’s hand when crossing a road until the age of 9.

### Changes in parental attitudes

In both age cohorts, significantly more parents at Phase Three believed they could prevent their child from being injured near the road. All of the parental attitudes in both age cohorts relating to general road safety behaviours increased significantly between Baseline and Phase Three representing possible effects from receiving the *Smart Steps* resources.

### Changes in parental behaviours

Changes in parental self-reported behaviours also increased significantly over time, specifically for parents walking with their child on or near roads, showing their child how to cross a road and explaining safe road crossing behaviours. Parents were also more likely to talk with and show their child how to practise safe passenger behaviours over time and were more skilled at checking a child car restraint although some behaviours of parents’ of 0-2 year olds (relating to checking the restraint was appropriately installed) decreased significantly over time.

### Changes in parental self-efficacy

In both age cohorts parents’ self efficacy to show, teach and practise road safety increased significantly from Baseline to Phase Three. Parents’ confidence to choose, restrain and change a child’s restraint also increased from Baseline to Phase Three for the parents of 0-2 year olds only. In the 3-5 year cohort, most parents at all time points believed they had the skills required to begin to show their child how to choose safer places to play, cross the road, alight a vehicle and wear restraints and as such, no significant change over time was observed.

### Road Aware Kids

### Changes in student knowledge

Year 5 and 8 students’ passenger safety knowledge was generally high across all time points with only Year 5 students’ knowledge of the safety door declining significantly over time, as did Year 8 students’ knowledge of seatbelt use and speaking up if a friend is speeding or taking drugs. Similarly Year 5 and 8 students’ pedestrian safety knowledge was also high across all time points, however the Year 8 students’ overall pedestrian knowledge was significantly higher at Phase Three compared to the group at Baseline. Riding safety knowledge was also high across all time points yet increases over time were only seen in Year 8 students’ knowledge from Baseline to Phase Three.

### Changes in student attitudes

Most Year 5 students’ attitudes toward safe pedestrian behaviours decreased over time. For Year 8 students, attitudes toward safe pedestrian behaviours improved at Phase Two and decreased again at Phase Three. Some Year 5 students’ beliefs (holding adults hand, wearing a seatbelt and protective clothing) regarding how they could make themselves safer on and around roads increased significantly from Baseline to Phases Two and Three, while comparable Year 8 students’ attitudes were relatively high at all time points with most peaking at Phase Two. Year 8 students’ safe driving attitudes also increased significantly from Baseline to Phases Two and Three.

### Changes in student behaviour

While very few Year 5 students reported they distracted the driver when travelling as passengers and most wear a seatbelt, few students sit in the back seat of the car or use the safety door on ‘every trip’ and these behaviours were used significantly more often at Baseline than Phase Three. Year 5 students reported they most commonly used five of the 10 recommended road crossing steps and use of one (‘*look for traffic in all directions’*) increased significantly over time. Year 8 students mostly implemented only four of the recommended 10 steps, however, use of five of these increased significantly from Baseline to Phase Three. Very few Year 8 and slightly more Year 5 students reported they wore protective clothing when they cycled, skated or scooted and these protective behaviours also declined over time. However significantly more Year 8 students at Phases Two and Three reported they checked for moving cars at driveways and intersections and chose safer places to ride, skate, scoot or blade. Year 8 students were significantly more likely to report safer intended driving behaviours from Baseline to Phase Three.

### Changes in student self-efficacy

At baseline most students reported saying ‘*no*’ to participating in a risky situation (such as riding without a helmet)., however at Phase three students were more likely to say ‘*no*’ to someone who was pressuring them to use risky behaviours as well as providing a reason for why they did not want to use that behaviour., Around one half of the Year 8 students surveyed felt they could influence a driver of other passengers in a car to use safer behaviours and when asked if they had said ‘*no*’ to risky passenger behaviours (such as getting in to a car with a person who had been drinking) of the 20-30% who had refused, most gave a reason to the person to whom they were saying ‘*no*’.

### Impact Analysis

To determine the impact of the Road Aware Kids program on student outcomes over time, a dose-response analysis was conducted where aggregated students’ reports of teachers’ discussion of particular road safety topics in the classroom (dose) were compared with changes in related student knowledge, attitudes, self efficacy and behaviour. No dose effect was found for Year 8 student knowledge and only Year 5 students’ use of the safety door increased with increasing dose. The amount of the program implemented did not appear to have a significant effect on any other passenger, pedestrian or riding behaviours, self efficacy or attitudes in the Year 5 student sample suggesting that increasing exposure to road safety education (not necessarily Challenges and Choices) in the classroom had little impact on students’ outcomes. For Year 8 students results were mixed. Some positive and other negative relationships were reported, therefore no dose-response relationships can be assumed in this study.

### Year 8 Teachers

The Year 8 teachers report of implementing *any* road safety classroom lessons varied at each time point (Baseline, Phase Two and Phase Three), with almost 40% teaching some road safety at Phase Two. However 23% of teachers at baseline (before implementation of *Challenges and Choices)* taught road safety while only 6% used *Challenges and Choices* at Phase Three. This higher proportion of Phase Two teachers reported to be implementing the program may be due to the selective sampling used at this time where only schools with staff who had received training in the use of *Challenges and Choices* were included in the study. When implementing classroom road safety activities most Year 8 teachers reported teaching passenger, pedestrian, bicycle and driver safety. Those Year 8 teachers who *did* teach road safety, spent between one and three hours discussing these topics with their students and implemented the activities in a variety of ways including on ‘*an as needs basis*’ or ‘*in small frequent sessions*’ and less commonly, ‘*on a regular basis*’.

At Phase Three significantly more of the Year 8 teachers had heard or read about the school’s road safety guidelines and procedures than the teachers at Baseline and Phase Two where the vast majority of the Year 8 teachers’ were unsure if the school had road safety guidelines or procedures. The Year 8 teachers at Baseline were the only group to report that *all* teachers at their school enforced the school’s guidelines about road safety. This perception declined at Phase Two, with most teachers indicating only *‘some’* staff enforce the policy; and increased again at Phase Three with most teachers indicating *‘most’* staff enforced the policy. This change in teachers’ awareness may be an artefact of cross-sectional sampling and of sampling only schools during Phase Two with staff who were trained in the *Challenges and Choices* resources. Previous school-based intervention research conducted by the Child Health Promotion Research Centre (CHPRC) found schools require between one and three years to develop and implement effective health policies [[40](#_ENREF_40)].

As a measure of institutionalisation of road safety in secondary schools, teachers were asked to report school principal’s prioritisation of road safety relative to other issues at school. Very few teachers at all time points (Baseline, Phase Two and Phase Three) believed road safety was a top priority for their Principal. Further, while most teachers at Baseline and Phase Two reported road safety was not a priority, more of the teachers at Phase Three were likely to report road safety was one of the ‘top five’ priorities, demonstrating a possible change in the way school administrators consider road safety. This may be an intervention effect of the *Challenges and Choices* resource but may also be due to the cross-sectional samples used in this research.

Over one half of all Year 8 teachers at each time point reported their school was implementing *Challenges and Choices*; however this declined from Baseline to Phases Two and Three. Schools most commonly implemented whole-school road safety programs such as bicycle education, walk to school days, assembly discussions and police visits.

At all time points (Baseline, Phase Two and Phase Three) teachers reported they had the *skills* and *confidence* to teach road safety to students, however they felt they could enhance their skills in areas such as ‘*helping students make safer road safety decisions in traffic*’, ‘*discouraging others from driving after drinking*’ and ‘*getting as much supervised driver training as possible*’. Teachers’ *attitudes* to road safety were consistent across all time points and overwhelmingly supported the role of parents and teachers as positive role models for road safety. .

### Primary School Teachers

Slightly more Year 5, than Year 2 and Kindergarten teachers respectively participated in the evaluation at each time point (Baseline, Phase Two and Phase Three), due mainly to many early childhood teachers declining to participate as they had not seen the resources. Most teachers participating in the evaluation had taught for 10 or more years. Approximately one half of the teachers included in the evaluation had spent less than nine years integrating road safety education into teaching programs. The majority of the teachers had taught road safety in each of the study years; however, fewer reported practising safe road skills with students (higher at Baseline than Phase Two and Phase Three). Of those who practised how to cross or use roads safely with their class, road safety was ‘*practised in the classroom*’, ‘*outside the classroom but within school grounds*’ and ‘*on a road outside the school*’. The majority of primary school teachers taught less than three hours of road safety, with a large proportion only teaching on an ‘*as-needs basis*’.

The majority of primary teachers reported children aged 9-11 years could cross roads safely by themselves and when asked about students’ developmental limitations when crossing roads, most teachers were able to correctly identify these limitations. Using a summed knowledge score, teachers’ knowledge of road safety increased over time from Baseline to Phase Two and Phase Three, with a significant difference found for teachers from Baseline to Phase Three. This may represent a possible intervention effect, although the cross-sectional sampling and lack of control group make this difficult to confirm.

A larger proportion of the Phase Three teachers had both heard and read about their school’s road safety procedures and guidelines than Baseline and Phase Two teachers. Approximately one-third of the teachers at all time points were unsure as to whether their school had road safety procedures and guidelines. Fifty-six percent of Baseline teachers indicated all or most staff enforced the whole-school policies / rules and procedures about road safety compared to 67% of Phase Two teachers and 62% of Phase Three teachers.

Similar to Year 8 teachers, most primary school teachers ‘*agreed*’ or ‘*strongly agreed*’ they had sufficient skills to teach students road safety. However, some teachers felt they could benefit from additional strategies to keep students safe when playing, wearing an approved helmet, using the safety door and choosing the safest place to across the road. Interestingly, students’ reported a decrease in their helmet wearing over time, which may reflect this lack in teachers’ skills to discuss helmet wearing with their students. Teachers’ *beliefs* about whether children under 10 should ‘*stop, look and listen before crossing the road*’, ‘*wearing a seatbelt*’ and ‘*riding on footpaths*’ were lowest at Baseline and steadily improved though Phase Two and Phase Three.

# 5.0 Discussion

## 5.1 Discussing possible relationships between changes in high level constructs

### Road Aware Parents

From Baseline to Phase Three parents’ knowledge remained low but increased slightly however attitudes, self efficacy and some behaviours (walking with child near roads, demonstrating how to cross roads and explaining safe pedestrian behaviours) increased significantly over time. Similarly, parents self efficacy to show, teach and practise safe road user behaviours also improved over time.

These findings are in part supported by the epidemiological evidence and are in part a new contribution to the field. Firstly, at Baseline parent’s knowledge in this study was relatively low, this is in stark contrast to other studies which have reported ‘*ceiling effects*’ where parent’s knowledge is high at the outset rendering improvements in knowledge difficult [[41](#_ENREF_41)]. Second, many empirical trials report significant changes in participant *knowledge* over time [[42](#_ENREF_42)], however the parents in this sample only attained non-significant increases in knowledge.

Third, the changes in knowledge demonstrated by this program related solely to children’s physical and cognitive limitations in the road environment. This may be explained by the diffused nature of the program being delivered through external agencies who only reach parents who already engage with them.

In this evaluation, parents’ attitudes toward preventing their child from being injured on or near roads increased significantly. Further, the positive changes over time in parental behaviours reported in this study (walking on or near roads, demonstrating how to cross roads and explaining safe pedestrian behaviours) may be explained by parents’ self-reported increased knowledge of their young child’s cognitive and developmental limitations around the road environment. In other empirical road safety intervention trials however, there has been no link between increased knowledge and actual behaviour change [[19](#_ENREF_19)]. Further, as this study is cross-sectional, no causal link between these knowledge and behaviour changes can be made.

Parents’ enhanced feelings of self efficacy to choose, retrain and change a child’s car restraint is mirrored by parents changes in actually checking their child’s restraint was appropriately installed. This change in self efficacy and behaviour may be explained by the popularity of the *Child Car Restraint* brochures distributed as part of the *Smart Steps* program and the coordinated efforts of the *Child Car Restraint Program* delivered by RoadWise.

Other changes in behaviours such as the modelling of safe pedestrian behaviours may be linked to parents reporting at all time points they had the skills to teach their child these skills. This provides some evidence that having the skills to teach and model road safety behaviours has links to parents’ actual behaviours [[43](#_ENREF_43)].

Parents *self efficacy* to help and show their child safer road safety behaviours also improved from Baseline to Phase Three, however there was no significant shift in parents’ *skills* to actually show their children how to practise appropriate road safety skills. This finding is consistent with other research [[44](#_ENREF_44)] and may be explained by the *Smart Steps* program being primarily targeted at increasing parents’ knowledge with few activities designed to increase parents’ skills (with the exception of the workshops which when attended, parents rated as highly useful). Further, delivery agency staff reported they mostly used the written resources rather than conducting specific road safety workshops for parents.

### Road Aware Kids

### Year 5 Students

Year 5 students reported some positive changes in road safety outcomes over time. Students’ knowledge of pedestrian and riding safety as well as attitudes toward safer road user behaviours were high across all time points. However only students’ beliefs they could help make themselves safer road users significantly increased from Baseline to Phase Three, and no significant differences were found for any of the knowledge constructs between Baseline and Phase Three. While this appears surprising given other road safety education programs reporting changes in knowledge and not behaviour [[19](#_ENREF_19), [36](#_ENREF_36)], it may have been difficult to demonstrate significant change here due to the ceiling effect noted when measures are high at the outset.

Year 5 students’ behaviours, particularly sitting in the back of the car, using the safety door and wearing protective clothing when riding declined significantly from Baseline to Phase Three. These were the only significant behavioural findings in the Year 5 cohort, and all were unintended. This decline may be related to the social desirability of using these protective behaviours, rather than a lack of education about their importance.

It appears from Baseline to Phase Three, students’ knowledge of road safety behaviours remained high and many attitudes and particularly behaviours did not change. It is well documented in the road safety intervention literature that it is much more difficult to change behaviours than knowledge [[45](#_ENREF_45)]. Many intervention trials designed to affect attitude and behavioural change have also reported equivocal findings or changes in some constructs and not others [[42](#_ENREF_42)]. This further adds to the calls for an investment in theoretically grounded intervention strategies that are contextualised in a real life setting, using realistic examples that meets an individual’s needs with positive feedback provided by a supportive adult [[10](#_ENREF_10)]. Further it demonstrates that young children’s developing cognition can hinder their ability to transfer abstract knowledge learned in a classroom setting to real life situations [[46](#_ENREF_46)]. Most importantly, as identified in many previous road safety position papers [[37](#_ENREF_37), [47](#_ENREF_47)], an investment in rigorous evaluation methodologies that track a cohort of students and teachers is required to investigate the effectiveness of the resources, followed by larger scale efficacy trials testing the ‘real world’ dissemination of the resources, rather than relying on a cross-sectional non-cohort study design such as the one used in this current evaluation.

An important finding in this evaluation is the likely impact students’ recall of teachers’ discussing the use of the safety door in the car had on the improvement seen in their actual use of the safety door. This was the only ‘dose-response’ relationship found in this study where student’s report of what teachers talked with them about is compared with actual changes in their knowledge, attitudes and behaviours. While it is unclear whether the *Road Aware Program* was the impetus for these class discussions, this is an excellent demonstration of the positive impact that can be seen of well implemented classroom discussions , influencing students’ road safety knowledge, attitudes and behaviours.

These student outcomes may be further enhanced by increasing the awareness and implementation of the *Road Aware Program* by Year 5 teachers. At both Phase Two and Three at least 70% of the Year 5 teachers reported they had not seen the Challenges and Choices resource. Even though at Phase Two only schools whose staff had received training in the *Challenges and Choices* resource were selected, only 30% of Year 5 teachers reported seeing and even fewer reported implementing the classroom materials. While these numbers of teachers implementing the resources appears low, it is consistent with implementation of other road safety resources freely available to schools in Western Australia [[35](#_ENREF_35)].

### Year 8 students

In general, Year 8 students reported more positive changes in road safety outcomes from Baseline to Phase Three than did Year 5 students. Road safety knowledge was generally high and mostly increased over time representing a significantly higher knowledge increase than could reasonably be expected by chance. This finding is consistent with other road safety evidence available in the peer reviewed literature [[19](#_ENREF_19)]. Specifically Year 8 students’ pedestrian, passenger, riding and driving safety knowledge increased from Baseline to Phase Three. Year 8 students reported using fewer safe road crossing procedures than Year 5 students however these appeared to increase in use between time points also. Similarly, students’ intentions to be safer drivers were high and also increased over time. This supports other intervention research which has found that young people’s intentions to be safe drivers start out high in early adolescence but decrease over time [[20](#_ENREF_20)]. Year 8 students’ pedestrian behaviours (choosing safe places to cross, thinking about when to cross, being seen by drivers and following traffic signs and signals) and safe riding behaviours (checking for cars at driveways and intersections, choosing safe places to ride and wearing protective clothing) increased significantly over time from Baseline to Phase Three, as did students’ attitudes however much of this increase was seen between Baseline and Phase Two.

There were also promising ‘dose-response’ findings from this evaluation and although it is unclear what the source of the road safety discussions were, there is a clear link between students recall of the amount of road safety information they were exposed to and their enhanced outcomes. In this study, Year 8 students who recalled their teachers talked with them about road safety a lot were more likely to report safer road crossing behaviours such as choosing a safe place to cross the road, stopping one step back from the kerb, and looking and listening for traffic in all directions. , This is to be expected, as increased exposure to effective road safety education would be expected to lead to improved outcomes [[43](#_ENREF_43)]. There were no relationships between the dose of discussions undertaken and riding safety behaviours except where students received a higher dose they were less likely to wear a helmet. This is an unintended intervention effect and given the cross-sectional nature of these data, cannot be easily interpreted. Similarly, students with a higher road safety dose were also less likely to report some future safe driver intentions. This can be in part explained by findings from other intervention studies which suggest increasing students’ confidence as drivers can actually make them take more risks when driving [[20](#_ENREF_20)], however requires further exploration within this sample.

Consistent with these knowledge and behavioural improvements among students over time, was the greater awareness and implementation of the Road Aware resources by Year 8 teachers, especially when compared with Year 5 teachers. Year 8 teachers also reported feeling more skilled and more confident teaching road safety to students, which aligns well with Year 8 students’ high level of knowledge and increases in knowledge over time. This is an important finding as typically at this age some road safety behaviours tend to decrease as young people challenge rules and conformity [[48](#_ENREF_48)]. These relationships should however be interpreted with caution as the teacher and student data in this study are not linked and come from different cross-sectional cohorts at each time point.

# 6.0 Conclusions

Given the potential for road safety education to achieve sustained improvement in behaviour change and reduction in road related trauma for youth as they reach adulthood, the findings of the evaluation study are significant for Western Australia. In addition, given the paucity of evidence of lasting intervention effects associated with road safety curricula or resources, this evaluation may have wider appeal nationally and internationally.

There is a dearth of international evidence describing best practice in road safety education in schools. Of the available evidence, most intervention studies have reported modest changes in students and parents’ knowledge, attitudes and behaviours. What most systematic reviews and road safety position papers point to however is the importance of school-based road safety education to support other environment and enforcement strategies.

The current study describes the impact of the Road Aware Parents and Road Aware Kids programs on students (9-14 year olds) and parents’ (of 0-8 year olds) knowledge, attitudes and behaviours. Data were collected from respondents at baseline, as well as one and two years’ post-program implementation using different cross-sectional cohorts at each time point. This study design is limited in its ability to make definitive links to the outcomes and each study’s implementation due to the cross-sectional cohorts, delayed program implementation after the Baseline evaluation and the diffused dissemination of the programs in schools and other delivery agencies. Nevertheless, the findings of this study provide the basis for some degree of optimism in relation to the success of the implementation of Road Aware Parents and Kids programs. The information provided here will also inform strongly future program directions.

Future research should be conducted using a randomised comparison trial design to determine if the implementation of the materials has a direct impact on students and parent’s knowledge, attitudes and behaviours.

One of the key objectives of this evaluation was to determine the reach of the program materials. The Road Aware Parents program, disseminated by delivery agencies such as Meerilinga, Ngala and Day Care/Playgroup centres, was delivered to parents through a range of mediums including provision of written materials (brochures/booklets), workshops, informal discussions and displays. However most delivery agencies reported distributing written materials and conducting informal discussions and parents reported the child car restraint booklet and other brochures were the most useful of these strategies. The program’s dissemination is limited to parents who attend these parent help centres and does not reach the greater population of parents in Western Australia. As such, parents’ knowledge in this study increased albeit non-significantly, attitudes improved over time as did some behaviours particularly relating to road crossing behaviours, passenger safety and child car restraint fitting and checking. It is difficult to determine through this study design if these changes are attributable to the implementation of the Road Aware Parents program as parents were recruited into the study using a random digit dialling telephone interview and may not have had any exposure to the program. Further, the Child Car Restraint program being implemented by RoadWise ran concurrently with the Road Aware Parents program and may be responsible for many of the improved outcomes. In either case, there has been an improvement in parents’ knowledge, attitudes and some behaviours since 2004.

Implementation and reach of the Road Aware Kids program was also problematic. Of the teachers in the sample who reported they used the curriculum resources, almost all reported excellent use and satisfaction with the resources and would use them again. However the proportion of teachers who had not seen nor used the resources was as high as 73% of Phase Two Year 5 teachers. At best, just fewer than 50% of Year 2 teachers at Phase Two had seen the resources. This is problematic and may be explained by the ‘*top down*’ dissemination of the resources through school leadership teams. It is possible that many classroom teachers are simply not aware of the resources. Half of all responding Year 5 and 8 students report their teachers talked with them about road safety at both Phase Two and Three, however it is not clear whether these discussions were initiated through the Road Aware Kids resources. Very few positive changes to Year 5 student outcomes were seen over time and no links between students’ report of discussions about road safety in the classroom and improved outcomes were found. Some positive outcomes were seen amongst Year 8 students over time and there were some significant relationships found between students self-reported class discussions about road safety and improved knowledge, attitudes and behaviours. Again these improvements cannot be categorically linked to the implementation of the Road Aware program, yet these outcomes show promise for its effectiveness.

# 7.0 Recent developments relating to Road Aware Parents and Kids Program

Since commencement of the Road Aware program implementation, a significant number of improvements have been made to enhance program accessibility and sustainability. It was considered vital to include these here to provide some context against which the evaluation recommendations could be viewed.

### Road Aware Parents

Road Aware Parents launched *Smart Steps,* an early intervention program in 2008 targeting the parents and carers of young children aged from birth to 4 years. *Smart Steps* is now in its 3rd phase of implementation which is designed to enhance program access and facilitate engagement to professional development by program facilitators with the outcomes of:

* increased program reach to parents and carers
* increased program sustainability

A new Presenter’s Kit resource will be launched early 2012. The resource was specifically developed to facilitate increased access to professional development by community organisations. Furthermore, the kit was designed in a format that can readily be applied to an online arena whereby community professionals and volunteers would be able to complete professional development online.

Additional developments:

* a road safety mascot Izzy has been developed. Evaluations have indicated that Izzy is an invaluable engagement tool for children and their parents and carers and is becoming synonymous with road safety for young children.
* Izzy will appear in 3 episodes of an upcoming TV program *‘Can’t wait for the weekend’* that maintains a reach of between 60,000 to 80,000 people providing further exposure to the *Smart Steps* program.
* 3 road safety story books with Izzy being the central character have been developed to address the road safety risk factors for children and facilitate parent/child discussions about being safe in the road environment.

### Road Aware Kids

To support the implementation of the *Challenges and Choices* program*,* SDERA have presented road safety professional development workshops to over 3,500 teachers located in the metropolitan and regional areas.

An interactive road safety website showcasing the SDERA Izzy mascot was completed in 2009 and targets specific road safety issues for children. The website supports the road safety messages promoted in the *Challenges and Choices* resources and offers teachers another strategy targeting students in Kindergarten to Year 4.

The *Challenges and Choices* resources have been implemented in the Northern Territory and ACT.

The rewrite of the *Challenges and Choices* resources commenced in 2011 and will

* reflect the *Principles for School Road Safety Education* (SDERA 2009);
* link to the Australian Curriculum content;
* address road safety issues for young road users and support the Safe Road Use cornerstone of the *Towards Zero Road Safety Strategy 2008-2020.*

# 8.0 Recommendations

The following recommendations have been developed collaboratively between Edith Cowan University, SDERA and Office of Road Safety representatives. They represent a summarised version of those provided in an initial report, revised based on recent program developments identified in section 7.0.

The discussion of the findings in this report indicates that it is difficult to unequivocally attribute some of the knowledge, attitudes and behaviour impacts measured over time to Road Aware program effects. This is due in major part to the research effort being able to isolate Road Aware program effects from the myriad of road safety information, education and communication that children and parents are exposed to in their daily lives. However, statistically significant data does confirm that if SDERA program materials are delivered to children and parents then positive changes that contribute to safer behaviour in the traffic environment are seen. Furthermore the Report is unequivocal about the positive perception of the quality of the road safety education materials provided by SDERA.

Significantly the Report provides specific guidance about how program strategy may be modified to enhance awareness and uptake of road safety education in school and community settings. In this regard recommendations arising from the findings of the Report will focus on increasing awareness, adoption, implementation and maintenance, institutionalisation, increasing capacity and, resource revision.

1. **Awareness**

The report identified that a significant percentage of teachers and the parent population that were contacted had limited awareness of the resources available to them to provide road safety education. Given that those teachers and parents who did engage with the materials were very positive about their quality and usefulness it is imperative that product marketing and promotion receives attention.

*Recommendation 1*

*SDERA dedicate specific resource capacity to undertake a marketing plan aimed at communicating with target audiences about support services and resources available.*

The marketing plan should be developed to engage audiences through current media and networking strategies as well as more traditional channels of communication.

*Recommendation 2*

*SDERA use a direct mail approach to communicate with past participants of workshops to continue their engagement and utilise their networks to market SDERA products and services.*

1. **Adoption**

SDERA has followed the practice of sending all new resources to all schools and agencies. While this strategy ensures every group has access to road safety materials it does not in any way elicit commitment to adopt and use the materials. The establishment of Service Agreements with key agencies involved the delivery of Parent Education has proven a successful strategy in developing commitment.

*Recommendation 3*

*SDERA maintain the practice of using Service Agreements with partner agencies as appropriate to establish commitment to the delivery of community based road safety education.*

*Recommendation 4*

*SDERA adopt a more targeted approach to the dissemination of support materials by using an “opt in” strategy.*

This strategy will require schools to take action to acquire SDERA resources by actively requesting materials after being made aware of their availability.

1. **Implementation, maintenance and capacity**

It is critical that road safety education becomes a standard component in the curriculum among schools and agencies. As children develop and migrate from being a passenger, to pedestrian, to user of wheeled devices to being a pre-driver they are faced with different traffic issues, so to must road safety education programs be adapted to meet the developmental needs of young people and prepare them for the challenges they face as they become a more mature road user.

Furthermore it is important that road safety educators feel confident and competent to deliver road safety education in their particular setting. Strategies that enhance school and agency capacity to engage in road safety education include workforce development through training, the provision of grants, the provision of current curriculum support materials and increased accessibility to support materials.

*Recommendation 5*

*SDERA to maintain workforce capacity building strategies through the provision professional development, training and the provision of current curriculum support materials.*

*Recommendation 6*

*SDERA encourages school based road safety activity by implementing a grant scheme that facilitates localised initiatives in the school and community settings.*

1. **Institutionalisation**

An ideal that is worthy of aiming for is the continuation of the commitment from schools and agencies to the delivery of road safety education as part of their core business. For agencies to institutionalise road safety education it should be written into their strategic, operational and business plans. SDERA has actioned this through the development of Service Agreements with key agencies. In the case of schools the commitment to road safety education would appear in their School Development Plan. The institutionalisation of road safety education through the planning process would be a clear signal the organisation has afforded priority to road safety.

The priority given to road safety education by their lead organisations will reinforce school commitment to institutionalisation. In this regard schools will look to the Department of Education, the Association of Independent Schools WA and the Catholic Education Office of WA for indications that road safety is an important issue to address in the school setting.

*Recommendation 7*

*SDERA engages schools in a whole school approach to road safety education by obtaining commitment to documenting action in the areas of curriculum, community and parent involvement and the development of policy and guidelines.*

*Recommendation 8*

*The lead education agencies represented on the SDERA Steering Committee commit to advocacy strategies that promote SDERA’s lead role in road safety education and the importance of the adoption of road safety education in the school curriculum*

1. **Revision of resources**

Currency of information, pedagogy and systemic curriculum alignment are important factors to address when convincing educators to adopt and implement road safety education resources. Furthermore it is essential that resources remain in step with the current available technology that educators use in their setting to engage students.

*Recommendation 9*

*SDERA maintain a scheduled program of resource review to ensure support materials align with current evidence of best practice.*

*Recommendation 10*

*SDERA explore the use of interactive web based strategies to engage teachers, parents and students in road safety education with a focus on user accessibility, ease of navigation and interactivity.*

# 9.0 References

1. AIHW [Australian Institute of Health and Welfare], *Young Australians: their health and wellbeing 2007*. 2005.

2. Office of Road Safety, *Road Safety Fact Sheet: August 2010* 2010: Available online: [www.ors.wa.gov.au](http://www.ors.wa.gov.au)

3. Office of Road Safety, *Data extracted from MRWA Integrated Road Information System - April (2011)*. 2011.

4. Road Safety Council, *Towards Zero Road Safety Strategy 2008-2020 Perth*. 2009.

5. School Drug Education and Road Aware, *Principles for Road Safety Education* 2002.

6. Road Safety Council, *Road Safety Policy for Infants, Children and Young People in Western Australia* 2002.

7. [AIHW] Australian Institute of Health and Welfare, *Serious injury due to land transport accidents, Australia 2006-2007*, in *Injury Research Statistics Series*, G. Henley and J. Harrison, Editors. 2009, AIHW: Canberra.

8. [AIHW] Australian Institute of Health and Welfare, *Young Australians: their health and wellbeing 2007*, in *Cat. no. PHE 87*. 2007: Canberra: AIHW.

9. Adams, J., *The role of parents/carers in the road safety education of children and youth*, in *Road Safety Research, Policing and Education Conference*. 2001: Melbourne.

10. Elliott, B.J., *Review of Good Practice: Children and Road Safety Education. Office of Road Safety*. 2000: Perth.

11. Ivett, L., *The role of parents/carers in the road safety education of children and youth*, in *Insurance Comission pf Western Australia Conference on Road Safety*. 2001.

12. Thomson, J.A., et al., *The effectiveness of parents in promoting the development of road crossing skills in young children.* British Journal of Educational Psychology, 1998. **68**(4): p. 475.

13. Morrongiello, B. and T. Dawber, *Toddlers' and mothers' behaviours in an injury risk situation: Implications for sex difference in childhood injuries.* Journal of Applied Developmental Psychology, 1998. **19**(4): p. 625-639.

14. Catchpole, J., et al., *Development of the Austroads School Road Safety Education Checklist - Final Report*. 2004, Austroads: Sydney.

15. Thorburn, L., *Summary of the SDERA School Road Safety Education Grant 2009I2010 – Review and Analysis*. 2010, SDERA.

16. Organisation for Economic Co-operation and Development (OECD), *Keeping children safe in traffic*. 2004, Paris, France: OECD Publications Service.

17. Duperrex, O., F. Bunn, and I. Roberts, *Safety education of pedestrians for injury prevention: a systematic review of randomised controlled trials.* British Medical Journal, 2002. **342**: p. 1-5.

18. Hardeman, W., et al., *Application of the theory of planned behaviour in behaviour change interventions: A systematic review.* Psychology and Health, 2002. **17**(2): p. 123-158.

19. Zeedyk, S., et al., *Children and road safety: Increasing knowledge does not improve behaviour.* British Journal of Educational Psychology, 2001. **71**: p. 573-594.

20. Poulter, D. and F.P. McKenna, *Evaluating the effectiveness of a road safety education intervention for pre-drivers: An application of the theory of planned behaviour.* British Journal of Educational Psychology, 2010. **80**(2): p. 163-181.

21. Raftery, S.J. and L.N. Wundersitz, *The efficacy of road safety education in schools: A review of current approaches*. 2011, Centre for Automotive Safety Research: Adelaide, South Australia.

22. Ampofo-Boateng, K., et al., *A developmental and training study of children’s ability to find safe routes to cross the road.* British Journal of Developmental Psychology, 1993. **11**: p. 31-45.

23. Bouck, L., *Development of a British road safety education support materials curriculum*. 1992, A&M University: Texas.

24. Matson, J.L., *A controlled group study of pedestrian-skill training for the mentally retarded.* Behavioral Research and Theory, 1980. **18**(2): p. 99-106.

25. Renaud, L. and S. Suissa, *Evaluation of the efficacy of simulation games in traffic safety education of kindergarten children.* American Journal of Public Health., 1989. **79**(3): p. 307-309.

26. Thomson, J.A., et al., *Behavioural group training of children to find safe routes to cross the road.* British Journal of Educational Psychology, 1992. **62**: p. 173-183.

27. Thomson, J. and K. Whelan, *A community approach to road safety education using practical training methods*. 1997, Department of Transport and Environment: London.

28. Thomson, J.A., et al., *The effectiveness of parents in promoting the development of road crossing skills in young children.* British Journal of Educational Psychology, 1998. **68**(475-491).

29. Tolmie, J., et al., *Development and evaluation of a computer-based pedestrian training resource for children aged 5 to 11 years*. 2002, Department for Transport, Local Government and the Regions: UK.

30. Rothengatter, T., *A behavioural approach to improving traffic behaviour of young children.* Ergonomics, 1984. **27**(2): p. 147-160.

31. Van Schagen, I. and T. Rothengatter, *Classroom instruction versus roadside training in traffic safety education.* Journal of Applied Developmental Psychology, 1997. **18**(2): p. 283-292.

32. Cullen, J., *Influences on young children's knowledge: the case of road safety educaton.* International Journal of Early Years Education, 1998. **6**(1): p. 39-48.

33. Cross, D., et al., *Child Pedestrian Injury Prevention Project: Student Results.* Preventive Medicine, 2000. **30**: p. 179-187.

34. Cross, D., M. Hall, and G. Hamilton, *Maximising parent involvement in the pedestrian safety of 4 to 6 year old children*. 2007, Child Health Promotion Research Centre, Edith Cowan University: Perth, Western Australia.

35. King, A., M. Hall, and D. Cross, *Western Australian School Road Safety Project: A process evaluation report* 2001, Wesstern Australian Centre for Health Promotion Research, Curtin University: Perth, Western Australia.

36. Di Pietro, D. *Road safety education in schools. Can we measure its success?* in *4th IRTAD Conference*. 2009. Seoul, Korea.

37. McKenna, F.P., *Education in road safety: Are we getting it right?* 2010, RAC Foundation: London.

38. Percer, J., *Child pedestrian safety education: Applying learning and developmental theories to develop safe street-crossing behaviours*. 2009, National Highway Traffic Safety Administration, US Department of Transportation: Wasgington, DC.

39. Schieber, R. and M. Vegega, *Education versus environmental countermeasures.* Injury Prevention, 2002. **8**: p. 10-44.

40. Child Health Promotion Research Centre, *A randomised control trial to reduce bullying and other aggressive behaviours in secondary schools*. 2008, CHPRC.

41. Muir, C., et al., *Parents as role models in road safety*. 2010, Monash University, Accident Research Centre.

42. Duperrex, O., F. Bunn, and I. Roberts, *Safety education of pedestrians for injury prevention: a systematic review of randomised controlled trials.* British Medical Journal, 2002. **324**(7346): p. 1129-34.

43. Nutbean, D. and E. Harris, *Theory in a nutshell: A guide to Health Promotion theory*. 2001, NSW, Austtralia: McGraw-Hill Book Company.

44. MacGregor, C., A. Smiley, and W. Dunk, *Identifying Gaps in Child Pedestrian Safety: Comparing What Children Do with What Parents Teach.* Transportation Research Record: Journal of the Transportation Research Board, 1999. **1674**.

45. Wundersitz, L., T. Hutchinson, and J. Woolley, *Best practice in road safety mass media campaigns: A literature review*. 2010, Centre for Automotive Safety Research: South Australia.

46. Thompson, J., et al., *Child Development and the aims for road safety education*, in *Report number 1*. 1996, UK Department of Transport: London.

47. Dowswell, T., et al., *Preventing childhood unintentinoal injuries - what works? A literature review.* Injury Prevention, 1996. **2**: p. 140-149.

48. Martin, A., *Factors influencing pedestrian safety: A literature review*. 2006, London Road Safety Unit: London.