

A systematic review of children's travel behaviour change programs in Australia

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Abstract

Children's independent mobility (CIM) defined as children's travel without adult accompaniment. Though there is limited data, what is available suggests precipitous declines in CIM have occurred in recent decades in many nations, including Australia. However, CIM matters for a number of reasons;

1. CIM is linked to levels of physical activity in children
2. CIM is central to children's rights to freedom of movement, within urban environments
3. Communities with increased CIM enable higher levels of social interaction, building social capital for children and their families, and contributing to children's mental health (Garrard 2009:8).

Interventions to promote children's travel behaviour are currently deployed by many Australian local and state governments. Past reviews of children's travel behaviour interventions suffer gaps in the tracking and exposition of the different approaches used in Australia, and in how programs and policies treat CIM within the particular Australian urban context. As part of a larger project on such interventions and CIM (the iMATCH Project) our intent is to identify the results of multiple approaches, identify successful interventions and highlight issues requiring attention. Following systematic collection of archival, documentary and informant-provided materials from across the states, this paper provides a review of Australian children's travel behaviour change programs for the years 2000 to 2011, complemented by a meta-analysis of published studies in this field. The objectives, delivery mechanisms and resourcing of programs are examined, and details on the roll-out and evaluation results for specific interventions provided. Learning from across the states are appraised, the effect of different approaches to resourcing, and the importance of holistic interventions targeting individual school's needs. The review shows that a specific sub-set of programs can be highly antagonistic to CIM and raises concerns about their benefit beyond niche contexts. There remain large questions about the role of school staff and of parental behaviours, attitudes and preferences. These latter dimensions could support improved interventions in future but further research is needed to test their influence.

1. Introduction

A small but significant investment has been made in recent decades in Australia on programs to encourage children and their parents to change travel behaviour and to promote safety for those walking and cycling to school. These programs have had diverse objectives. Many have had short timespans, others have changed and evolved over time. The rise of children's independent mobility (CIM) as a major issue within the field of child development studies raises questions as to if and how Australia's children's travel behaviour change programs address this emerging imperative.

As will be shown, past reviews of children's travel behaviour interventions in Australia have key limitations in breadth and focus, and there has been little attention given to how programs and policies treat CIM within the particular Australian urban context. As part of a larger project on such interventions and CIM (the iMATCH Project on *independent Mobility, Active Transport and Children's Health*) this paper provides a review of recent Australian activities with the intent and delivery mechanisms for individual programs are identified, and, where readily available, results of previous evaluations explored. Our intent is to highlight areas of concern around specific travel behaviour interventions, and to identify areas warranting further investigation.

The paper commences by defining children's independent mobility and exploring its dimensions and importance. Children's travel behaviour change initiatives are introduced and key previous research findings examined. The review methods are provided, followed by the results and discussion.

2. Methods

The methods follow closely those used by Pucher et al. (2010) in undertaking a not dissimilar review of cycling programs in the US. This involved using a range of search terms (i.e. 'walking' AND 'schools' AND 'Australia') in the search engines of Google, Google Scholar and TRID (the Transportation Research International Documentation database of the Transportation Research Board). We sought evaluations and information on those programs that explicitly promote active travel to school. This excludes programs such as bicycle education. Given the tight frame, very few papers were published in scholarly sources and so a systematic search of key state government agency and large local government websites was also undertaken. A small number of additional sources were provided by contacts within government agencies and researchers engaged in activities with members of the research team.

There are a number of key limitations to this work. Firstly, the review did *not* seek to provide an exhaustive summary of every intervention being employed in every state and local government across Australia, which would require resourcing well beyond that available to the research team. Instead it sought to focus on key types of programs, and to identify key exemplars at national level or in particular jurisdictions. Second, there is minimal information on the public record about some of the more unsuccessful initiatives and past initiatives in this field. For instance, there is minimal information on the largest of the failed walking school bus schemes that were established in Australia, though it was possible to piece together sufficient information to provide a meaningful summary of their experiences. Third, some of the material sourced was solely from proponents of particular initiatives, which raises questions as to the reliability of key information. Fourth, studies at various scales were included, using widely different approaches, reflecting the broad nature of this field. As such, it is at times difficult to make direct comparisons for some aspects across the types of initiatives used in Australia. This review does not seek to provide convincing evidence for which initiatives are most effective in total travel behaviour change, compared to each other, though it does explore the efficacy of individual initiatives. Instead our focus is more on process evaluation and the way in which initiatives are incorporating CIM.

A total of twelve key evaluations were obtained, with more than twenty additional source materials used in developing the following results.

3. Background

3.1 Children's independent mobility

CIM may be defined as the freedom of children to travel without adult accompaniment. Hillman et al. (Hillman 1993) and Whitzman et al. (2009) suggest it is a basic right of children to be able to walk, to bicycle, and to use public transport, to get to destinations such as schools, libraries, friends and family, to open spaces and other destinations, without adult supervision. Though there is limited data, what is available suggests precipitous declines in CIM have occurred in recent decades in many nations, including Australia.

As recent reviews of children's active travel have shown, children's walking and cycling, including to school, has many benefits by and of itself (Davison, Werder and Lawson 2008; Sirard and Slater 2008). However, CIM matters for a number of reasons. First and foremost, CIM is linked to levels of walking, cycling and other non-motorised human-propelled means of children's transport, and to levels of physical activity in children. There are significant deficits in children's physical activity levels in many nations, due to sedentary lifestyles, and the prevalence of overweight and obesity has increased globally at the same time that decreases in active transport have occurred (Garrard 2011). The 2007-08 National Health Survey results indicate that 24.9% of children, aged 5 – 17 years are overweight or obese in Australia (Garrard 2009:6). Overweight and obesity during childhood and adolescence is of particular concern because of growing evidence that overweight and obese children suffer the same co-morbidities as overweight and obese adults, are at high risk of becoming overweight adults, and suffer increased morbidity during adulthood, even after weight loss (Timperio et al. 2004). While the causes of overweight are complex, recent attention has focused on the role of the active transport in perpetuating weight gain (Marten and Olds 2004). Children who walk and cycle to school have higher levels of cardiovascular fitness than inactive travellers (McMinn et al. 2011). Children who actively commute are also more active at other times of the day (Cooper et al. 2003).

Second, CIM is central to children's rights to freedom of movement, in urban environments where children are today often marginalised or excluded to a small set of child-centred locations, such as playgrounds. Where children use public spaces more those spaces tend to be safer (Garrard 2009). Children who walk and bicycle gain (human) motor skills, navigation, road-sense and a range of other cognitive skillsets. And communities with increased CIM enable higher levels of social interaction, building social capital for children and their families, social interaction, and contributing to children's mental health (Garrard 2009:8).

CIM is often conceptualised as an evolving set of graduated 'licences', provided by parents and guardians to children as they age, from staying within sight, to playing in the front yard, to venturing into the street, to travelling short distances, to eventually roaming freely (Whitzman et al. 2009:5). The licences provided to children are multi-dimensional, covering a set of different permissions to cross roads or to ride a bicycle, to travel with other children, or to travel alone (Marketta 2004). Children who do not have licenses for independent travel to key destinations, such as their school, must rely on parents either to accompany or drive them to school. This may contribute to traffic congestions and broader problems of motorcar use in sensitive school precincts.

The way that parents and students travel to and from school is affected by a complex interaction of many factors. The main factors identified by parents in limiting children's freedoms are perceived threats from traffic and perceived threats from strangers, whilst other factors limiting children's active travel include distances from home to school, a lack of public transport, and time pressures on parents (Wen et al. 2008b:326). Other factors include involvement of one or both parents in the paid workforce, distance from home to a parent's workplace, number of cars available to the household, availability of public

transport, safety and walkability of the environment around the school, and the views of parents about the safety of that environment (Cole et al. 2007). Parents' decisions about travel to and from school are also influenced by their intentions to travel to other destinations, and how they may link those trips with the trip to school (Cairns et al. 2004). Children are indeed vulnerable to both traffic and stranger danger and limiting exposure to the street is a sensible precaution until children are capable of dealing with the general (low level) threats provided in neighbourhoods. However, there are numerous ways in which others are also trying to reduce these threats, or limit exposure, via a set of initiatives in the built, social and policy environments, that seek to reduce barriers to children's walking and cycling.

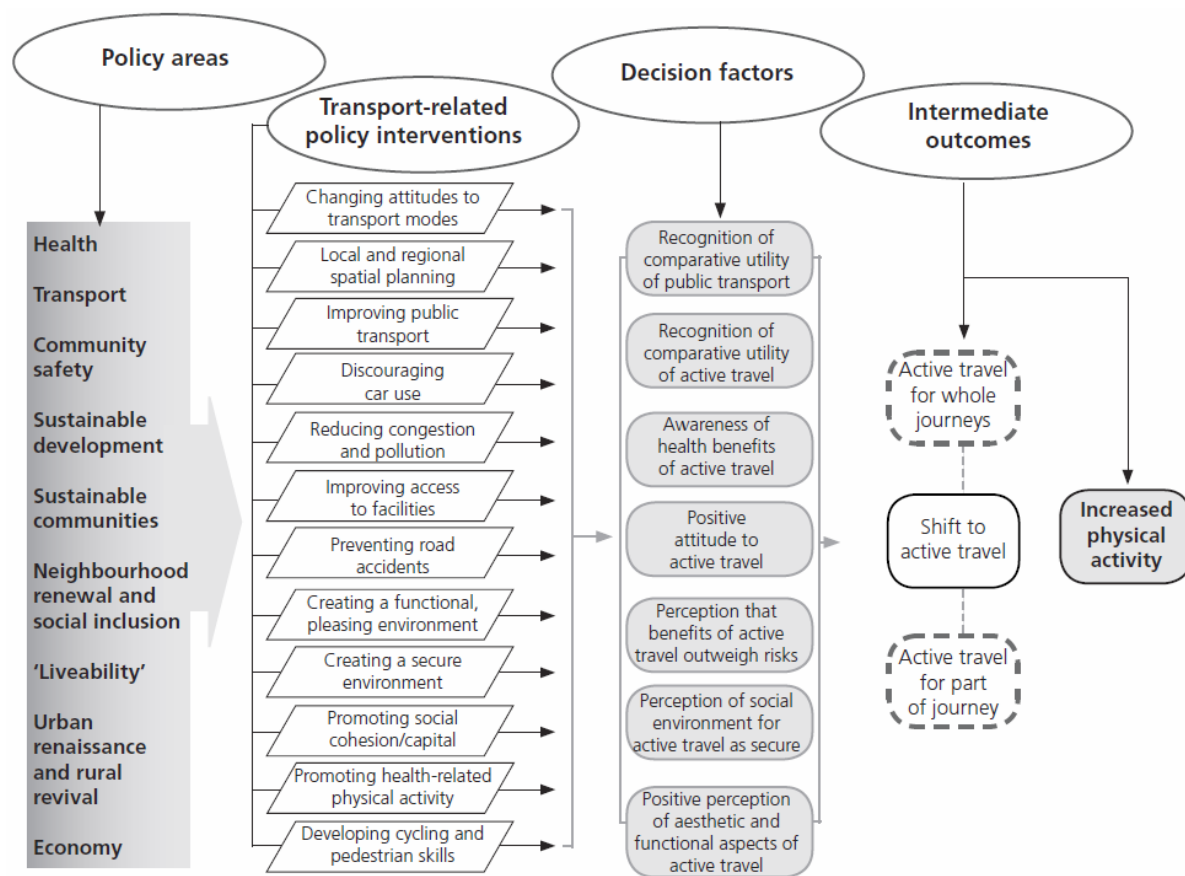
3.2 Children's travel behaviour change initiatives

In response to these concerns, local councils, central governments and other interested organisations around the world have introduced a variety of interventions to influence physical activity by increasing children's independent mobility, in order to reduce the dominance of cars on the school journey. Policy makers have introduced numerous policy interventions targeting children's travel behaviour in order to improve local traffic congestion, children's physical activity and health, and to reduce vehicle emissions. Policy interventions include:

- *walk-to-school initiatives* (which includes a broad set of initiatives from single walking-to-school events, through to organised 'walking school buses'),
- *bicycle programs*,
- *neighbourhood travel behaviour programs*,
- *road safety initiatives* (especially safe-routes-to-school programs, but also including posted street travel speed interventions and crossing supervisors)
- or *combinations* of the above (including school travel planning)

These initiatives are generally underpinned (whether explicitly or not) on a social-ecological model of behaviour change. Though there are many such models, most assume there are mutually interactive associations between physical environment factors, social environment factors, policy and regulatory environment factors, and individual factors (Garrard 2009:10-11). A summary of the possible links between policy interventions and travel behaviour change for any population (not just children) is provided in Figure 1.

Figure 1 Possible relationships between travel behaviour change interventions, mode shift, active travel and physical activity; Source: Killoran et al. (2006)



The more popular and extended initiatives in schools in different states and neighbourhoods in Australia include *Travelsmart (Schools)* programs, *Safe Routes to School*, *Walk to School Day*, and walking school buses.

There are many other policy or program interventions that intersect with but that do not explicitly target travel behaviour change. Examples include the trials to encourage more walking (but not necessarily walking to school) using pedometers, such as that employed by Schofield et al.'s (2005) successful trial with older Australian girls in Central Queensland. Such initiatives are not considered within this review, which focuses solely on travel behaviour change interventions.

Previous international reviews of travel behaviour change interventions, which include children's travel, include the work of Ogilvie et al. (2004) Killoran et al. (2006) Yang et al. (2010) and Möser and Bamberg (2008). The large systematic review by Möser and Bamberg (2008) found only limited and often inconsistent evidence for school-based travel behaviour change initiatives. For instance, attempts at creating safer cycling routes to school had no significant impact on child cycling rates in Texas (Yang et al. 2010).

Research into what makes for effective travel behaviour change initiatives for children has not been strong and the key factors are not known. However, Garrard (2011:8) notes that though systematic assessment of the reasons for differential results from initiatives has been lacking, 'the determinants of success are likely to include factors associated with schools and their social, cultural and built environments, program type and quality of implementation'. Whether initiatives can transition from being effective in participating schools to appreciable mode shift at the city or national level is now yet demonstrated.

Other challenges include the nature of interventions for children, the vast majority of which are delivered via the school setting. Such interventions tend to work best when they have 'multicomponent strategies' such as an 'Active and Healthy School' program, with a number of entry points into the program, and promotion via different approaches and settings (in and out of class; in the playground, the classroom and at home) (Naylor and McKay 2009:12). This is not how many Australian travel behaviour change programs work.

3.2.1 Walking Programs

A. Walk to School Programs

A number of programs focused primarily on events and activities to promote walking to school, via social marketing, have been used widely in Australia. Perhaps the largest, *Walk Safely to School Day* (WSTSD) commenced in 2001. An initiative of the Pedestrian Council of Australia, the WSTSD was assessed by Merom et al. (2005). At that stage, the WSTSD was primarily a NSW activity and the evaluation focused on NSW alone. The researchers evaluating the initiative used a register of participating schools, school evaluation forms, and telephone surveys conducted with randomly selected households in the two weeks after the event, the latter recruiting 812 parents or primary carers of a child aged 5-12 and who were responsible for overseeing or taking that household's children to school (Merom et al. 2005:102). The researchers found that by 2004, 751 schools were participating, but that repeated participation for three consecutive years was low. Interestingly, The schools reported that the main reasons for their likely continuation in the program were 'to raise awareness of road safety' and to 'reinforce students' knowledge of safe pedestrian behaviour' (Merom et al. 2005:103). Broader transport, sustainability and health objectives were not of such importance for their involvement. For the parents and care givers surveyed and who had participated and walked at least part of the way to school (representing 177 children) 69% usually walked to school on a Friday (the intervention day) suggesting an increase of 31% in children walking due to WSTSD (Merom et al. 2005:103).

Another similar initiative is *International Walk to School Day* (IWSD), held in October annually (see <http://www.iwalktoschool.org>) which attracts attention in schools across Australia and institutional support in some jurisdictions. VicHealth (the Victorian Health Promotion Foundation) used IWSD as part of its broader 'Walktober Walk-To-School' initiatives. In 2009, over 70,000 children in 372 schools across Victoria participated in this initiative. In contrast to the Pedestrian Council's program, VicHealth's initiatives are primarily health and physical activity focused. Recent changes have seen the rise of a new institutional structure for walking advocacy in Victoria, named Victoria Walks, which has since promoted Victoria Walks to School, which ran in October 2011. Again, the focus of this event is more on transport, physical activity and health, rather than road safety.

Figure 2 Images promoting Victoria Walks to School Day and Walk Safely to School Day



The distinct differences in these two programs are meaningful, particularly in terms of how they deal with children's independent mobility. The Pedestrian Council's WSTSD promotes very strong messages about children requiring adult supervision – indeed hand-holding – if aged 10 or under. The WSTSD website provides 'key messages' for teachers and parents including:

- *Hold a grown-up's hand when you're on the footpath*
 - *Hold a grown-up's hand when you're in the car park*
 - *Hold a grown-up's hand when you cross the road*
 - *Wait till the bus has gone, then use a safe place to cross the road*
- (<http://www.walk.com.au/wstsd01/Page.asp?PageID=269>)

The promotional materials for WSTSD continue this theme, as shown in Figure 2, where a stylised adult holds two children's hands. This focus on adult supervision is at odds with the key messages of the Victoria Walks to School Day and IWSD programs, which though cognisant of and promoting of road safety, are much more supportive of CIM. The levels of adult supervision and handholding promoted by the Pedestrian Council are beyond what many children, particularly those aged 8-10, require. Given few parents have the time to walk their children to school (and walk back) promoting such high levels of parental supervision and handholding could conceivably be counter-productive for travel behaviour change.

B. Walking school buses

A *Walking School Bus* (WSB), allegedly an Australian innovation, is 'a group of children who walk to and from school chaperoned by responsible adults' (Mendoza, Levinger and Johnston 2009). This initiative responds to parental concerns about traffic and stranger danger by providing structured walking with chaperones, usually volunteers from the school community. Parents, guardians or other adults act as 'drivers' and 'conductors' at the front and rear of a platoon of children, walking a set route and collecting children on their way to school. WSBs often place restrictions on children, in that parental chaperones tend to set rules regarding behaviour whilst on route, preventing over-aggressive play, ball playing or use of electronic devices. Many programs also require children to wear high-visibility safety vests, which they tend to complain about (Kong et al. 2009:323) or which may lead to teasing from other children (Colac Otway Shire 2005).

Unheard of twenty years ago, WSBs proliferated widely in the late 1990s and early 2000s in Australia. Western Australia used WSBs as part of their *Travelsmart to School* program (see below) since 2003, by coordinating the overall program, providing key resources, and training local council officers. Competency training and street audits were required for each WSB route, in order to provide liability cover. In 2006 there were 39 WSB routes to 26 schools (John 2006). But they have not been an unquestioned success.

VicHealth had a large program but ceased funding after a 2007 review. By then around 48 schools in 12 Victorian council areas had participated in the program. The review found that the programs achieved some successes but were resource intensive, had lengthy project planning and management requirements, had difficulty in attracting and maintaining volunteers, and were isolated from other transport initiatives (VicHealth 2007). They also tended to cater only to younger students, and did not encourage children to walk or cycle independently to school, doing little to promote CIM generally. Though funding has ceased, VicHealth's website retains advice to communities who may want to start their own on effective strategies (<http://www.vichealth.vic.gov.au/wsb>) but informs clearly of these limitations.

One of the largest programs in Australia was the 'QUT Walking School Bus' Program, funded by Queensland Transport, which at its height had recruited around 100 schools

across the state. Yet it imploded within two years, due primarily to problems retaining volunteers and maintaining the 'buses' in operation.

South Australia maintained a large program from 2002, following a trial at two schools, run as a partnership between Transport SA and a local council. But it too found the program limited, with problems establishing liability protections for volunteers in the early phases. Wherever it spread enthusiasm quickly waned, with the number of participating schools plummeting from 23 in September 2007 to only seven in November 2008 (Bartram 2009:5-6).

A longer-term study of WBS longevity in the face of these problems is provided by Kingham and Ussher (2005) in Christchurch, New Zealand, which found very few survive beyond one-and-a-half years, with burdens on volunteers and failures to recruit students cited. However, in a survey of parent-coordinators, the number one reason given for the discontinuation of WSBs was described as 'kids old enough to walk or bike alone' (Kingham and Ussher 2005:317).

Given these problems, walking school buses may still have applications in niche local circumstances, but as a state or national program they appear to have limited appeal. Perhaps more importantly, they do little to promote children's independent mobility, and as shown in New Zealand, they are responding to a problem that may not necessarily be there, especially as children age and no longer need parental supervision. Indeed, some aspects of WSB programs may be quite counter-productive to broader objectives of encouraging children's independence.

3.2.2 Cycling Programs

A. Ride to School Programs

Various ride to school programs and events are used in Australia, often as part of broader bicycle participation programs.

Cycle to School Day is held annually in Western Australia, as part of Bikeweek. Resources for schools to hold their own event are provided through the Department of Transport's website. This year around 18,000 students were believed to have participated across 132 schools (<http://www.transport.wa.gov.au/activetransport/25126.asp#25129>). The largest event nationally is *National Ride2School Day*, supported by Bicycle Network Victoria and the Victorian Government, and which is attracting attention in other states. In 2012 around 1100 schools participated nationally, equating to approximately 140,000 children.

Bicycle Network Victoria's broader Ride2School program is probably the largest program nationally by participation, which has involved around 2,000 schools across every state and the ACT. It offers cycle skills training, in addition to tailored advice and strategies for increasing participation, including assistance with bicycle storage solutions and cycle promotion events, though not necessarily funding. An evaluation of the program in 13 Victorian primary schools in 2007 found mixed impacts on active travel, with parents reporting an increase, but students reporting a slight decrease in active modes to school. The review highlighted the importance of at least one 'cycle champion' in a school for scheme success, the school prioritising active transport across staff and programs, and infrastructure conditions in and around the school, as factors influential in the success of these programs (Garrard and Crawford 2009).

Though not explicitly stated as an objective, these rides to school programs are broadly supportive of CIM, providing opportunities for children to potentially shift from adult-supervised travel to independent travel to school.

B. Bike Buses/ Bike Trains

Bike Buses (or Trains) take the walking school bus idea and convert it to the bicycle mode. A bike bus is a group of students riding to school, accompanied by adult cyclists, on a designated route. The idea was promoted in Australia by groups such as VicHealth with their 'Pedal Pod' though very few schools nationally have taken up the idea. The Trinity Beach State School in Queensland is the most prominent school in Australia with an active bike bus. Over 90 students travel regularly to the school along two key routes. Led by the deputy principal, the program, developed with the Queensland Government, has been paralleled with bicycle education and storage development at the school (Allen and Johnson 2011). Factors that have made this school so successful are not yet well understood, but may include its somewhat unique catchment and built environment, the presence of such a cycle champion within the school, and the development of a supportive social environment throughout the school community and especially amongst parents.

The bike bus has the same limitations for children's independent mobility as walking school buses. However, without further research on actual bike buses, of the kind performed on WSBs, it is difficult to definitively state how such programs intersect with the CIM agenda.

3.2.3 Integrated Programs

A. School travel planning / Travelsmart / Streets Ahead

School Travel Plans try to achieve behaviour change by planning a context-appropriate set of actions. The full process involves establishing baseline data, identifying barriers and opportunities, developing actions, implementing them, monitoring and evaluating outcomes, and handing over the plan for embedding in the school's policies and culture (Peddie and Somerville 2006:87).

The Victorian Department of Education ran a school travel planning initiative in twenty-nine primary schools and five secondary schools from around 2002, with funding that allowed for works in and around school sites. Other activities, such as a staggered departure times for students who walked or were being picked up by car at one school, cost nothing. In general the program appeared to increase active transport at the schools, with schools reporting drops in traffic levels and poor driver behaviours (Peddie and Somerville 2006:89-90).

Generally, these programs have been pulled under the banner of 'Travelsmart', although not all Travelsmart Schools initiatives incorporate the full school travel planning process. The first full iteration of Travelsmart schools in 2004 in Victoria achieved a 24.9% increase in walking, a 48.0% increase in cycling and an 8.0% reduction in the number of trips taken by car, across 17 primary schools (Hughes and Di Pietro 2005). In NSW, the program involved 15 schools mainly around Sydney, five of which were Catholic schools. An evaluation of outcomes in five of the 15 schools found that active transport to school increased in only three, two of the schools decreasing active travel over a longer period.

In Western Australia, a large Travelsmart Schools program has run since 1998, with around 30-60 schools participating annually. The first pilot school increased walking by 118% and reduced car trips by 22% (Transport [WA] 1999:16) By 2006, some 10,000 children from 160 schools had participated with the program achieving around 18% less school traffic (John 2006).

In South Australia, there is also an impressive history of school interventions, funded under the TravelSmart banner. By 2010, around 190 schools and 14,000 students had participated. More recently a new pilot scheme has commenced, funding a smaller number of schools, but seeking to work over a much longer intervention period. Ten schools participated in 2010 (see <http://www.transport.wa.gov.au/activetransport/24618.asp>).

Brisbane City Council has run its own similar program for many years now, adapting the Travelsmart Schools methods to their own needs. A key component of their program are 'Walking, Wheeling Wednesdays' activities, which encourage children on one day a week to try active transport to school. The hope is that children and parents are familiarised with all that is needed for active transport, and that for those who find it works for them, active commuting may become entrenched week-long behaviour over time. The Council reports 117 schools had participated since 2004, with an average 35% reduction in car trips at participating schools in 2010 (Brisbane City Council 2011:7).

Though generally these results seem impressive, the only controlled trial of Travelsmart in Australia had mixed findings. In 2005, another similar intervention was run in NSW by the Central Sydney Walk to School Research program, funded by the New South Wales (NSW) Health Department, as part of a larger health promotion scheme. 24 schools in inner western Sydney participated in the trial. This involved a broad intervention including the development of school travel access guides, classroom activities and some limited improvements to built environments around schools by local councils. The researchers found little evidence of an impact of the trial on children's walking to and from school, with students in both the intervention and control groups reporting increases in their walking behaviour, and high variations across the schools (Wen et al. 2008a).

Perhaps the most recent iteration of the school travel planning approach was the *Streets Ahead* initiative in Victoria. Not to be confused with an engineering-based intervention program of the mid-1990s by the same name, VicHealth funded six councils of highly varying socio-economic status for a three year intervention involving collaborations with councils to effect changes to the built environment, programs and activities in schools and capacity building for local community groups. Funding was focused on a cluster of around three schools in each site. The program sought to 'to create supportive environments that increase children's active travel and independent mobility in all aspects of their local community life, not only to and from school (VicHealth 2011:5). As such, the program was the first of its kind in Australia to *explicitly* place children's independent mobility as a first order priority. The results of the trial indicated large differences between the high and low socio-economic sites. The more disadvantaged sites had the highest rates of active travel and CIM, with one school achieving over 80 per cent mode share – extremely unusual in the Australian context (VicHealth 2011:6). Some of the activities were particularly inventive, including involving the local Men's Shed at one site to assist with providing custom-built racks to house scooters, which have become a significant mode at many Australian schools (VicHealth 2011:9).

B. Safe Routes to School

Of all the road safety initiatives that have it is *Safe Routes to School* (SRTS), a program usually administered by transport departments in state governments, that has most intersected with the travel behaviour change agenda. The program tends to involve surveys of local needs and behaviours, action-plans with a strong engineering component, as well as enforcement and encouragement activities, and some monitoring and evaluation. Pioneered in the USA, this approach has helped improve the street environments surrounding many schools with funds made available for improvements such as pedestrian crossings, crossing supervisors, signals, traffic calming measures, and shared paths.

International evaluations on the effectiveness of SRTS suggest some impact on active travel, though impacts on CIM are unclear. Boarnet et al. (2005) studied ten schools in California, using a cross-sectional approach that separated out students who passed key SRTS projects on their way to school and students who did not. Parents self-reported significant increases in active travel, particularly walking, after the SRTS improvements had been made, with the largest gains being for those whose children were directly affected by the improvements, results similar to those obtained elsewhere in the US (Staunton, Hubsmith and Kallins 2003).

In Australia, SRTS has altered slightly from its US counterparts. In the late 1990s it was adopted in NSW without an engineering intervention, and more as a hybrid behaviour change intervention – a precursor to what became the state’s Travelsmart initiatives. In its first year the program reached 100,000 families alone via surveys of children’s travel and parental attitudes and concerns. 400 local action plans were developed in 1999 as a result, to assist future works programs and traffic safety education programs (Wall 2000). The largest evaluation of SRTS in Australia (Rose 1999) compared and contrasted state SRTS initiatives through to the late 1990s. By that time Victoria and Western Australia had mature engineering-led safety-focused programs, South Australia was following Victoria’s lead, and NSW was committing itself to its large program absent of engineering components. The evaluation noted the importance of managing expectations about the scale and timing of possible engineering investments, given capital works budgets are often locked in for the coming year. SRTS programs were also beset by ongoing maintenance issues, both in terms of the educational component, but also in terms of treatments installed as part of SRTS programs (Rose 1999:14-15)

Since that time SRTS has continued in many jurisdictions, but the broader Travelsmart programs have been where much attention and investment has mainly concentrated. As such, there has never developed the coordination and national attention given to SRTS in Australia that there is in the United States. And SRTS is no longer necessarily the common term used. For instance, Queensland has effectively rolled SRTS into its ‘Safe School Travel’ (*SafeST*) program, delivered by the Department of Transport and Main Roads, which includes other initiatives, including programs targeting safety of child passengers in cars and buses. Administered through road safety advisors, *SafeST* includes limited funds for minor works, under a *Safe Walking and Pedalling Program* (SWAPP). The latter is explicitly not about specific ‘safe routes’, with the TMR website informing ‘Rather than simply making children adopt a particular safe route to and from school, the program also aims to increase the number of walking and cycling trips taken by children’ (<http://www.tmr.qld.gov.au/Safety/School-road-safety/Safe-school-travel-safest/School-zones-road-safety-initiatives.aspx>).

Evaluations of these initiatives beyond road safety are limited or non-existent in the Australian context. Given patchy implementation, it is not easy to determine their impact on active travel or CIM. However, SRTS and its variants is not in any way antagonistic to CIM, and is likely to be a useful promoter.

4. Discussion

The review highlights a number of problems for our understandings of how policy interventions are promoting active travel and how they treat CIM in particular. The review shows that a specific sub-set of programs may be highly antagonistic to CIM, including key national programs (Table 1).

Unsupportive of CIM, walking school buses are flawed in other ways, given their poor longevity and resource-intensiveness. Initiatives such as *Walk Safely to School Day*, as currently promoted, do not appear to have incorporated the latest research findings on CIM appropriately into their planning and design. Without any research base, it is difficult to determine how bike buses, such as the long-running and successful program at Trinity Beach State School, may encourage or discourage CIM. Initiatives such as TravelSmart, Walk and Ride to School programs and Safe Routes to School already support CIM, and some could be adapted to further promote this imperative. Yet, none of these initiatives is compelling as a response to all the problems of car-based school travel in the Australian context, which likely says much about our built and social environments not helping support children’s walking and cycling. **Table 1: Integrated evaluation**

Initiative	Aims	Methods	Implementation	CIM	Evaluations
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<p>Walking/ Bike School Bus</p>	<ul style="list-style-type: none"> • a safe and convenient way for children to travel to school; • improvement of health and well-being of children through walking and talking; • an opportunity for children to learn road sense and traffic safety; • reduction of traffic congestion around schools; • contributing to a sustainable environment; • opportunities for children and parents to develop friendships and a sense of place and community in their neighbourhood (http://www.travelsmart.gov.au/) 	<p>Working Group comprising members from school Parent Association, parents, students, the school principal and teachers</p>	<p>By working with individuals in partnership with organizations and institutions</p>	<p>Regarding to the need of being accompanied with adults, does not have direct impact on CIM</p>	<p>Program can be operate as frequently as volunteers were able to commit their time so cannot make any basic change in AC to school</p> <p>(http://www.transport.wa.gov.au/)</p>
<p>Initiative</p>	<p>Aims</p>	<p>Methods</p>	<p>Implementation</p>	<p>CIM</p>	<p>Evaluations</p>
<p>Walk and ride Safely to School Day</p>	<ul style="list-style-type: none"> • To encourage parents and carers to walk to school with primary school age children and reinforce safe pedestrian behaviour. • To promote the health benefits of walking and help create regular walking habits at an early age. • To ensure that children up to 10 years old hold an adult's hand when crossing the road. • To help children develop the vital road-crossing skills they will need as they become mature pedestrians. • To reduce the car dependency habits that are being created at an early age and which will be difficult to change as children become adults. • To promote the use of Public Transport. • To reduce the level of air pollution created by motor vehicles. • To reduce the level of traffic congestion. (http://www.walk.com.au/) 	<ul style="list-style-type: none"> • Social marketing campaign supported by the Australian Government, all State, Territory Governments and Local Governments 	<p>National program, with particularly strong participation in NSW</p>	<p>Does not encourage CIM because the main point of the program is participating parent with young children walking or biking to school</p>	<p>PCA website reports that children's participation on the program is completely different in each state and neighbourhoods</p> <p>http://www.transport.wa.gov.au/activities/transport/24618.asp</p>
<p>Travel smart</p>	<ul style="list-style-type: none"> • Introduce students to the benefits of sustainable travel options • Reduce the impact of the car on our environment, health and community • Encourage individuals to think about how they can change their travel habits by choosing and using a range of transport modes • Identify personal and environmental benefits of planning and using a variety of travel options. (http://www.travelsmart.gov.au/teacher) 	<ul style="list-style-type: none"> • Social marketing campaign supported by the Australian Government, all State, Territory Governments and Local Governments • Made schools compete for prizes 	<p>Department of planning and infrastructure in participate with Millennium Kids organisation</p>	<p>Although the focus of program is just in commuting to school and not on CIM, but it can have effective influence.</p>	<p>Reports shown up to 20% reduction in car trips but just during the limited period that program held.</p> <p>(http://www.travelsmart.gov.au/teachers/index.html)</p>

	s/index.html)				
Safe roots to school	<ul style="list-style-type: none"> • To improve the level of safety for children travelling to school • To encourage active travel to school using identified safe routes 	<ul style="list-style-type: none"> • Local Governments assist schools to evaluate the safest route. • This program is managed by RoadWise. 	<p>Department of Transport (DoT) in partnership with local governments</p> <ul style="list-style-type: none"> • A combination of engineering treatments, education, enforcement and encouragement strategies 	It is a continues program that can have gradual effect on CIM	It is recognized that undertaking outcome evaluation in the SRTS context is not a simple task and that a starting point would be greater discussion of underlying issues from an outcome evaluation perspective.

Other future research needs raised by this review include the lack of controlled trials and/or evaluations that capture multiple dimensions of travel behaviour change, including CIM. Even the recent *Streets Ahead* program, which included CIM as a first priority objective, failed to report major changes in CIM behaviours as part of their recent evaluation (VicHealth 2011). This may require significant changes to methods, including improving the commonly used 'Hands Up' (in class) approaches to measuring children's mode of travel, so as to incorporate measures of independence, as well as funding controlled trials where appropriate. There also remain large questions about the role of school staff and what is needed to make initiatives 'work' for Australian schools, given their other priorities, in each local context. Energies expended on unsuccessful initiatives may prevent schools committing to other more suitable programs. Moreover, there remain only limited understandings of parental behaviours, attitudes and preferences in terms of many of these interventions. Research in all these areas may support improved interventions in future.

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