Walking, riding or driving to school: what influences parents' decision making?

Phase 1: Literature review

Summary of key findings

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1 INTRODUCTION

This report comprises a review of research findings on parental barriers to children's active travel to and from primary school. The report commences with a summary of rates of primary school age children walking and cycling to school in Australia and South Australia, followed by a review of Australian and international data on children's accompanied and independent active travel to school. Subsequent sections review factors that impact on children's active travel to school and independent mobility, and initiatives and mechanisms to increase levels of active travel for primary school age children that focus on overcoming parental barriers.

Physical activity is important for the growth and development of children, but only 19.4% of Australian children aged 5-17 years achieve the recommended 60 minutes or more of physical activity each day (Australian Bureau of Statistics, 2013). Recent research indicates that incidental physical activity such as walking and cycling to get to local destinations such as school, plays an important role in children meeting recommended levels of physical activity (Davison et al., 2008; Lubans et al., 2011; Smith et al., 2008). However, in recent decades, Australian children's rates of active travel to school have declined markedly. In the 1970s the majority of children walked or cycled to school, but currently, most children are driven to school (Garrard, 2010) (Australian Bureau of Statistics, 2013).

Many factors have contributed to the decline in active travel among children in Australia. These can be categorised into the four segments shown in Figure 1, which portrays a social-ecological model of four mutually interactive domains that influence travel behaviour.
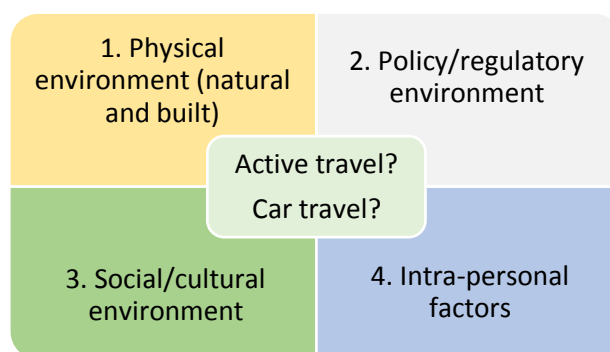

Figure 1: Social-ecological model of active/inactive travel behaviour

The focus of this report is on intra-personal factors; specifically, the role of parents in determining how their primary school age children travel to and from school. While the focus is on parental characteristics and on parents' perspectives, attitudes and expectations, it is also important to recognise that many of these parental factors are shaped by factors within the built/natural, policy/regulatory, and social/cultural environments. In addition, there is increasing recognition that the influence of environmental factors on parental school travel behaviour is mediated by parents' perceptions of environmental factors (eg perceived personal safety and traffic safety), in addition to actual conditions (Mitra, 2013).

Policies and programs aimed at increasing active travel to school can therefore be directed at (a) changing parental behaviour by focussing directly on intra-personal factors such as parents' perspectives, attitudes and circumstances, and/or (b) changing the physical, policy/regulatory, and social/cultural environments that shape parents' and children's travel behaviour.

2   RATES OF CHILDREN AND YOUNG PEOPLE WALKING AND CYCLING TO SCHOOL: AUSTRALIAN AND INTERNATIONAL DATA AND TRENDS

Rates of active travel to school among primary school age children in Australia and South Australia are among the lowest in OECD countries. Most active trips are for walking (about 22% of trips to and from school), with a small number of trips by bicycle (about 2-3%). Rates of active travel to school have declined substantially in Australia since the 1970s, with walking and cycling trips replaced mainly by car trips (Garrard, 2011).

Several developed countries have maintained high levels of active travel to school; for example, 98% in Japan; 87% in the Netherlands; 59% in Denmark; 61% in Finland; 58% in Norway; and 52% in Great Britain. Many of these countries have relatively high rates of both walking and cycling to school; with the exception of Great Britain, where active travel to school is mainly by walking. Establishing the conditions under which cycling becomes an appealing mode of travel to school for distances that are too far to walk substantially expands the active travel catchment area of schools, enabling many "too far to walk" trips to school to be replaced by cycling rather than driving.

The comparative Australian and international travel to school data described above indicate that high rates of car travel to school are not an inevitable consequence of living in a wealthy, developed country with high rates of car ownership, but are likely to be due to a range of factors across the four segments of Figure 1 that encourage car use and discourage active travel.

There is considerable potential for active travel to school to make a substantial contribution to Australian children meeting recommended levels of physical activity through 'incidental' physical activity, particularly in the transition from childhood to adolescence, when overall rates of physical activity decline, especially among girls (Australian Bureau of Statistics, 2013).

3 ACCOMPANIED AND INDEPENDENT ACTIVE TRAVEL TO SCHOOL

A number of studies have measured primary school students' rates of active travel to school, but few Australian studies include data on who accompanies children on active trips to school. This information is important because there are indications that different factors come into play when parents consider accompanied or unaccompanied active travel to school (Faulkner et al., 2010). A small number of studies have reported that children's active travel to primary school is mainly among children who are unaccompanied by an adult (ie alone, or with siblings or friends). However, this varies according to a range of factors, including child age.

The above finding is consistent with studies that have found that the level of independent mobility parents allow their children is associated with active school travel. That is, children who are permitted higher levels of independent mobility appear to be more likely to walk or cycle to school, and less likely to be driven to school (Ducheyne et al., 2012; Ghekiere et al., 2016).

Most studies report that, in general, older children (commonly 10-12 years and over in English-speaking countries such as Australia) are more likely to walk or cycle to school independently. However, there is considerable variation:

- Over time in Australia - in previous decades younger children were permitted more independent mobility.
- Between countries - children in Europe and Japan are generally granted independent mobility at a younger age than in English-speaking countries such as Australia, USA and the UK (Carver et al., 2013; Fyhri, 2011; Shaw et al., 2013).
- Among parents, for example, more support for independent mobility (at a younger age) among English-speaking households in Toronto, Canada (Mammen et al., 2012); among those who perceive it to be socially acceptable (Valentine, 1997); and among more disadvantaged families (Valentine, 1997).
- Depending on trip distance, whereby younger children may be permitted to move around independently for short distances in their own street, while older children are permitted a greater 'roaming distance' (Carver et al., 2014).
- According to whether or not the child attends primary or secondary school; with secondary school students permitted more independent mobility than primary school students of the same age (Carver et al., 2014).
- Based on whether or not the child is accompanied by older siblings or friends (Carver et al., 2014).
- Based on parents' perceptions of the safety of the neighbourhood (Ducheyne et al., 2012; Faulkner et al., 2010).

Child age has traditionally been seen as the key determinant of independent mobility, but other factors that are potentially modifiable are also important. These include skills, experience, confidence (child and parent) and social approval. Children's acquisition of safe walking and cycling skills plays an important role in parents permitting their children to travel to school independently (Ducheyne et al., 2012; Trapp et al., 2011).

It has been proposed that parents' decision-making about the trip to school is a two-step process involving: (i) an initial decision on whether or not to accompany the child to school (primarily influenced by assessments of the child's maturity and skills, social safety and traffic safety); followed by (ii) mode choice (ie parent-accompanied active travel or travel by car), based on parents' perceptions of the easiest and most convenient way to travel, which in turn are influenced by factors such as perceptions of travel time and/or distance to/from school and whether or not parents need to complete multi-activity trip chains (Faulkner et al., 2010).

There are some indications that there may be greater potential to increase independent active travel to school than parent-accompanied active travel. A small-scale study in Victoria found that a post-program increase in active travel to school in an inner Melbourne

metropolitan primary school that had participated in the Victorian Ride2School program was mainly for unaccompanied walking and cycling (ie children travelling alone, or with siblings or other children) (Garrard et al., 2009). However, this finding needs to be confirmed by additional research, as most evaluations of active school travel programs do not differentiate between accompanied and independent travel to school.

4 FACTORS THAT IMPACT ON PRIMARY SCHOOL STUDENTS' ACTIVE TRAVEL TO SCHOOL AND INDEPENDENT MOBILITY

As noted earlier, many factors impact on children's modes of travel to and from school. 'Parental barriers' to active travel to school are an important sub-set of these influences on children's active school travel, but should not be seen in isolation from the environmental, policy and social factors that shape parents' perspectives and subsequent decisions (see Figure 1). In social-ecological models such as the one in Figure 1, the segments are mutually interactive. Consequently, while this review focuses on 'parental barriers' to active school travel, it also includes environmental, policy and social factors that shape parental perceptions that can then act as barriers to active school travel.

This section also combines research into correlates of primary school students' active school travel and children's independent mobility, as the two are inter-related, with both areas providing relevant research findings.

Most of the research findings in this section are presented under sub-headings based on the four areas of influence outlined in Figure 1. However, studies that investigate parents' self-reported reasons for choosing school travel modes (usually parent surveys) generally produce reasons that span the four segments. The following section describes these overall findings, before presenting the more segment-specific data.

4.1 Parent-reported reasons for accompanying and/or driving children to school

Research findings related to reasons why parents use active/inactive and/or accompanied/independent travel for primary school students come from both parent surveys and environmental measures, with some studies combining both.

Parent surveys, which usually ask about factors spanning the four segments of the social-ecological model (Figure 1), produce mixed results depending on question wording and study location. Traffic safety and social safety concerns are consistently identified by parents as key barriers to active travel to school (Lu et al., 2014). However, safety concerns appear to be higher in English-speaking countries such as the UK and Australia, compared with some European countries, where the convenience of car travel appears to be more important. A possible reason for this difference is that the convenience of car travel may emerge more strongly when levels of perceived safety are relatively high.

In a Victorian study which asked parents about reasons for driving children to school, the convenience, comfort and speed of car travel were more important than concerns about safety associated with children's active travel to school (Garrard et al., 2009). In Australian studies, parents appear to be more likely to express concerns about social safety and traffic

safety when asked about barriers to active travel to school, rather than when asked about reasons for driving children to school.

Australian and international research indicates that parents' reasons for using active/inactive and/or accompanied/independent travel for primary school students are complex and multi-faceted. Care needs to be taken with the wording of survey questions designed to obtain this information, and in the interpretation of survey findings, as findings are influenced by the framing of survey questions as well as contextual factors.

Nevertheless, safety concerns (both social safety and traffic safety) and the convenience of car travel (especially for longer trips to school, and trip-chaining) are important barriers to active school travel. The two-step active school travel decision-making process proposed by Faulkner et al. (2010) suggests that perceived safety is the key influence on whether or not parents allow independent travel to school (step 1), with considerations such as the perceived benefits of driving, walking or cycling important for mode selection (step 2).

The following four sections describe findings categorised according to the four segments of the social-ecological model of school travel described in Figure 1.

4.2 Individual factors

4.2.1 Child demographic and psycho-social factors

Child demographic factors include age and gender; and child psycho-social factors include children's perceptions, attitudes, preferences, and behaviours.

Children's age (consistently), gender (inconsistently) and birth order are associated with active school travel. Shaw et al. (2013) report that the gender 'gap' appears to be reducing over time, with some studies indicating that girls may achieve boys' levels of independent mobility by travelling in groups. Maturity and birth order (whereby second children are given more independence) have also been identified as influences on independent mobility (Johansson, 2006).

In surveys conducted as part of evaluations of active school travel programs, students express a strong preference for walking and cycling to school over traveling to school by car. The main reasons students give for preferring active school travel are the benefits of fitness and exercise; enjoyment of walking or cycling; the opportunity to socialise with friends; and quick travel time (for cycling). In a UK study, most primary school students felt safe in their neighbourhoods (though girls less so than boys), with social safety a greater concern for children than traffic safety. Primary school age students shared parents' concerns about their social safety, but were less concerned than parents about traffic safety (Shaw et al., 2013).

In summary, primary school students appear to prefer active travel to school over car travel, suggesting that barriers to active school travel reside primarily with parents and their circumstances rather than children.

4.2.2 Parental demographic factors

Parent demographic factors that have been associated with children's active school travel include car ownership, ethnicity, socio-economic position, and parents' needs for trip-chaining. Socio-economic position is inconsistently associated with children's independent mobility and active travel to school (Shaw et al., 2013), as is location (urban or rural). There are also mixed findings for ethnicity, though there appears to be a tendency for parents from minority ethnic groups in Australia, the UK and other European countries to place greater restrictions on their children's independent mobility (Crawford, 2015; Mammen et al., 2012; Shaw et al., 2013).

In their study of 'parental fear' in Victoria, Crawford et al. (2015) reported that children were less likely to be independently mobile if they were:

- Younger (9-10 years old)
- Female
- Living in a metropolitan area (compared to a rural or regional area)
- Living with a disability
- Living with a younger parent
- Speaking a language other than English at home
- Had a parent with lower educational attainment (ie, not a tertiary qualification)
- Living in a more disadvantaged neighbourhood.

Household access to a private motor vehicle is associated with driving to school, as is having a parent available for escorting, and trip-chaining requirements. Common trip-chains include parents' travelling to work and to meet other household commitments including driving children to after-school activities (Mitra, 2013; Lu et al., 2014; Wen et al., 2008; Fyhri et al., 2011).

On the other hand, parents' flexible working arrangements (including working hours and work from home options); parents themselves travelling actively to work; and parents travelling actively to school when they were children are associated with children's active travel to school (Mitra, 2013; Ghekiere et al., 2016; Wen et al., 2008).

4.2.3 Parental psycho-social and behavioural factors

Parental psycho-social influences on active school travel include factors such as perceptions, attitudes, trust in others, habits and social norms. One or more of these factors are often included in research into correlates of children's active travel to school and independent mobility, with concerns about 'stranger danger' (ie social safety) and traffic safety comprising key parent-reported constraints on children's active school travel and independent mobility (Carver et al., 2008; Crawford et al., 2015; Shaw et al., 2013). Parents' *perceptions* of the local environment are important, as the relationship between quality of the travel environment and independent travel has been found to be mediated by parents' perceptions of the safety of the travel environment (Fyhri and Hjorthol, 2009; Mitra, 2013).

Deciding when, where, how, and under what circumstances to allow their children independent mobility is a difficult decision for parents. A large Victorian study found that

parents were more likely to restrict their child's independent mobility if they were concerned about being judged by other parents, family or teachers; if they did not perceive independent mobility to be beneficial; and if they believed that their child lacked the necessary skills to be safely independently mobile (Crawford et al., 2015).

Two important interactive influences on parents' decision-making are: (i) concerns about being 'blamed' for not being a 'good' parent by allowing levels of independence not considered by others to be appropriate or 'normal'; and (ii) parents basing their risk assessments on the attitudes and behaviours of family members, other parents, and the wider community; rather than quantitative estimates of the risks of child assault or traffic injury.

The risk perception and risk communication literature also makes the important distinction between risk perceptions and actual risks (Fischhoff et al., 2002). Consideration of the qualitative components of risk perceptions relevant to independent active travel to school can assist in understanding and addressing parents' concerns about social safety and traffic safety. Short walking and cycling trips are no more risky in terms of traffic injuries than many (longer) car trips[1], but are often perceived to be more risky due to a number of 'qualitative' perceptual factors, such as sense of control over the safety outcome (personal control increases perceptions of safety), and frequency of exposure to the potential risk (frequent behaviours such as driving can be perceived to be safer that more infrequent behaviours such as walking or cycling).

In the risk perception and risk communication literature, improved understanding of people's risk perceptions can be used to develop 'fear reduction' measures. A Victorian study of parental fear as a barrier to children's independent mobility reported wide variations in parents' fear scores, and identified a number of factors that influence parents' fear ratings, some of which are amenable to change (Crawford et al., 2015). Increased understanding of the wide variations in parental concerns about social safety and traffic safety, and the reasons for differences among parents, will assist in the development of strategies to address these concerns.

In order to address parents' concerns about social safety and traffic safety, dual strategies are required that reduce both the actual and perceived risks of children walking and cycling to school independently.

Parental use of active transport as a child, or currently as an adult, are both associated with children's active school travel. Possible reasons for this association include parents' positive attitudes to active transport; familiarity with active transport enabling parents to teach children safe walking and cycling skills; and parents being able to assess (through observation) when their children are ready for independent active school travel. When

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[1] When focussing solely on a school trip of, say, one kilometre, the relative risk of injury is greater for walking or cycling than for driving, although the absolute risk (ie risk of injury per population, time spent travelling, or distance travelled) is relatively low for all modes of transport (see full report for more detail). Longer car trips (to various destinations) can be associated with an absolute risk of injury similar or greater to the risk of injury associated with a short walk or cycle to school, but longer car trips tend to elicit lower levels of concern than short active trips to school. That is, parents appear to express more concern about short exposures to a higher risk/km than long exposures to a lower risk/km, even though the absolute risk might be the same or higher.

children are in the habit of being driven to school when they are young, it may be harder for them to transition to active school travel when they are at an age when it is feasible, due to parents' and children's lack of experience with walking or cycling to school.

In car-oriented countries like Australia, driving a car to most destinations most of the time can become habitual behaviour for many people, including parents. Guidelines should be developed to assist parents to break the habit of regular car use for trips that are potentially walkable or bikeable. Measures are likely to include preparation and planning for active school travel that make the active travel choice an easier choice (eg readily accessible bicycles; secure and accessible bike storage at school; identifying and practising safe, pleasant routes to school; establishing informal walking or cycling groups along common routes to school).

4.3 Environmental factors

Distance to school is a key constraint on active travel to school, but evidence from a range of sources indicates that "too far to walk or cycle", needs to be understood not just in terms of quantitative distance but also in terms of the environmental, psychological, cultural and lifestyle factors that shape perceptions of "too far". "Too far" might also serve as a proxy for "too unsafe"; as the risk of assault or injury is perceived to increase with increased exposure to unsafe walking or cycling conditions over longer distances. That is, if active school travel routes are considered to be safe, the trip to school may be less likely to be perceived by parents to be "too far" to walk or cycle.

In several European and Asian countries, not only do children walk longer distances to school than in Australia, but they are also more likely to cycle to school as trip distance increases. In Australia, car trips largely replace walking trips for trip distances greater than about one kilometre, but in several European countries, cycling replaces walking for many trips greater than 1 km.

There is potential to increase active school travel by reducing trip distance to school by establishing more compact urban form, local schools of uniformly high quality, and school enrolment zones. In addition, understanding why potentially walkable/bikeable distances are considered "too far" may assist in expanding the perceptual walkable/bikeable catchment areas of schools.

A component of "too far to walk/cycle" is likely to be "takes too long". Reducing both the time advantage of car travel to school (eg limited car parking near schools, "no vehicle zones" around schools, and reduced speed limits in residential areas surrounding schools) and the *perceived* time advantage of car travel to school (which may be greater than the actual time advantage) is likely to contribute to increased active trips to school by reducing the perceived 'convenience' advantage of car travel for busy parents.

There is also considerable potential to expand active school travel distances by encouraging more cycling to school, including by establishing safe cycling conditions.

Other environmental constraints on active school travel that were summarised in a recent systematic review include:

- Traffic safety (eg speed, volume)
- Freeway/highway/crosswalks
- Road safety
- Bad weather
- Busy street
- No direct route
- Lack of footpaths
- No/insufficient lights or crossings.

(Lu et al., 2014)

4.4 Social/cultural factors

Social/cultural factors include social safety[2], behavioural norms, and social/cultural beliefs, attitudes and expectations. Social factors also include a number of household characteristics and parental psycho-social factors that were summarised in Section 4.2.

Concerns about social safety are a frequently reported constraint on children's independent mobility in Australia, the UK and USA; but less so in European and Asian countries that often have high rates of active school travel (Bringolf-Isler et al., 2008; D'Haese et al., 2015; Fyhri et al., 2011; Johansson, 2006). It has been suggested that in these countries, parents with high levels of social/community connections (a component of social capital) may rely on 'diffused social control' in the form of passive observation and support from other neighbours (Shaw et al., 2013). This form of community oversighting of children's wellbeing in public spaces has also been reported as a support for active school travel in Germany and Japan (see Section 5).

Social distrust in the form of 'stranger danger' has been well-researched as an influence on active school travel, but 'trust in others' has been less well-researched. There are indications that parents are more concerned about stranger danger when trust in others is low.

Parents' concerns about traffic safety also have a number of social elements. As described above in Section 4.2, parents' risk perceptions and views on appropriate levels of independent mobility for their children are, to some extent, socially constructed. In addition to (a) trusting strangers not to pose a threat to children; and (b) trusting other community members to keep an eye out for children; parents need to trust drivers to take care to avoid harming children who are walking or cycling to school.

While the physical aspects of road safety as a barrier to active school travel are well-researched (ie walking/cycling infrastructure, traffic speed/volume); the social/behavioural aspects of road safety are less commonly investigated. In car-oriented countries such as Australia, parents and children themselves are largely held responsible for the safety of children moving about in the public domain. In contrast, in the high-active school travel countries in Europe and in Japan, drivers are required to exercise a high duty of care to

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[2] 'Social safety' is a term used to describe protection or the feeling of being protected against the dangers caused by human actions in public spaces. Examples of these incidents are aggressive behaviour, public drunkenness, vandalism, drug trading and use, assaults and murder (Zwerts et al., 2010).

avoid collisions with children walking and cycling (eg through driver education, 'strict liability', and social norms that are highly critical of driver behaviour that places children at risk of injury).

Parents express concerns about their children making "one false move", even when parents are confident their children have good walking and cycling skills. Parents' concerns about "one false move" can be addressed by measures that protect children in the event of the child making a mistake. Avoiding injury in the event of road user error is an underlying principle of Safe System road safety strategies; but in Australia, this principle has been applied more consistently to motor vehicle occupants than for child pedestrians and cyclists (Lydon et al., 2015).

Parents who can trust in drivers to (a) obey road rules, and (b) take extra care around child pedestrians and cyclists, will be more likely to allow their children to travel independently to school, possibly for longer distances, and by bicycle. Developing a Safe System strategy that focusses on children's active travel to school sends the (social change) message that the safety of children walking and cycling to school has higher priority than motor vehicle through traffic around schools.

Due to the influence of schools on social norms of appropriate travel to school behaviour, further research is warranted into the extent and degree to which schools support/promote active school travel; reasons for support or lack of support; and parents' perceptions of whether or not schools support active school travel.

4.5 Policy/regulatory factors

Policy/regulatory factors include policies from the three tiers of government (local, state and federal) across the multiple sectors that impact on active school travel (transport, planning, education, health and the environment). Policy/regulatory factors are under-researched but potentially important influences on active school travel, including via the influence that policy/regulatory factors have on the built environment, including road networks, school location, and school size and enrolment zones.

At the local level, school active travel policies have the potential to influence children's active school travel, including by helping to establish a 'culture' of active travel that supports parents to allow their children to travel to school independently.

In terms of road safety policies, studies that have investigated the impact of interventions aimed at lowering traffic speed on walking and cycling rates provide some evidence of increased walking and participation in 'street life' (Sauter and Huettenmoser, 2008). More consistently reported (and measured), were improved perceptions of traffic safety among residents following the introduction of traffic calming measures.

Based on consistent evidence that traffic safety concerns are a major barrier to children walking and cycling (see Section 4.2), residents' perceptions of increased traffic safety are likely to lead to increased walking and cycling in traffic calmed areas, including for children walking and cycling to school.

There are also some indications that while short reduced speed zones (eg 250m school zones, and traffic calming in some residential streets) can reduce traffic injuries for pedestrians and cyclists in these areas, it is likely that more extensive reduced speed areas

(ideally ≤ 30km/h in all residential areas) are required to increase safety, perceived safety and walking and cycling for transport within neighbourhoods. This is likely to be particularly important for increasing children's cycling trips to schools for intermediate trip distances (eg 1-3 km) that in Australia are largely undertaken by car; but, in extensively traffic-calmed neighbourhoods in Europe and Japan are cycled (see Section 2).

Another policy-driven factor that is a key determinant of active school travel is the distance from home to school (also see Section 4.3). Several policy-related factors influence trip distance, including population density, street connectivity, school location, and whether or not educational policies require that children attend their nearest public school.

School amalgamations, siting relatively large schools outside residential areas, and the policy of public school choice can contribute to longer trip distances and consequently increased car travel (Active Healthy Kids Australia, 2015). Requiring children to attend their nearest public school reduces trip distance and may lead to an increase in active school travel. This policy reduces parents' choice of schools; however, in countries such as Switzerland and Japan, that have adopted this policy, efforts are made to ensure that all public schools provide high quality education, so that parents are not disadvantaged (and do not feel disadvantaged) by the lack of school choice (see full report for details).

While these state-level educational policies are beyond the scope of the present study, they nevertheless highlight the intersectoral nature of influences on active travel to school, and point to possible long-term collaborative efforts to improve child health and wellbeing by adopting policies that contribute to making active school travel safer, easier and more appealing for parents and children. Examples of countries and cities that have done this are described in the full report in the form of international case studies of Japan, Zurich (Switzerland) and Munich (Germany).

There is also potential for individual schools to adopt policies and related programs and activities that support active travel to school. For example, an over-arching "Active travel to school policy" (along the lines of school Healthy Eating Policies, or SunSmart policies) could be developed by School Councils, and communicated to parents. Such a policy could state an overall commitment to encouraging active travel to school, together with some combination of programs (eg Bike Ed), activities, curriculum, 'school rules' (eg parking, school uniforms/bags/books), and infrastructure (eg secure bike storage) that support active travel to school. An Active Travel to School policy could also include working with other agencies (eg DPTI, local councils) to, for example, improve traffic safety around the school. A school Active Travel policy could also assist in removing barriers to active school travel and provide a 'lens' through which other school decision-making could be viewed, asking, for example, "Is decision X consistent with encouraging active travel to school?"

5 INITIATIVES AND MECHANISMS TO INCREASE LEVELS OF ACTIVE TRAVEL FOR PRIMARY SCHOOL AGE CHILDREN THAT FOCUS ON OVERCOMING PARENTAL BARRIERS

Evaluated active school travel programs have demonstrated mixed success in increasing active school travel rates (Chillon et al., 2011; Macmillan et al., 2013; McDonald et al., 2013; Ogilvie et al., 2007; Sirard and Slater, 2008; Yang et al., 2010). While few of these programs address parental barriers to active school travel directly, many active school travel programs

commonly include strategies that address some parental barriers to active school travel. In terms of the social-ecological model of school travel behaviour (see Figure 1), most programs focus on intra-personal and physical environment factors, with fewer addressing social/cultural factors and policy/regulatory factors.

Comprehensive models of the determinants of active school travel have recently been developed that include a number of these 'missing' factors (Mitra, 2013), and future active school travel interventions will benefit from giving increased attention to these factors. For example, social norms associated with school travel and being a 'good' parent are important influences on parents' school travel behaviour, but few active school travel programs include measures specifically aimed at changing these social norms, for example, by effectively communicating messages such as:

- "This is an active transport school"
- "Active transport in our school is high and/or increasing"
- "We have made it safer for children to walk or ride to school"
- "The whole school community supports active travel to school, ie, school principal, teachers, local government, police, community leaders, parents".

In terms of changing social norms in support of active school travel, the more voices that parents hear expressing these views, the greater the influence on parents' beliefs, attitudes and behaviours. Based on the evidence described in this review (see Sections 4.2 and 4.4), the voices of *other parents* who permit their children to travel actively and/or independently to school are likely to be particularly influential; as are consistent messages from school principal, teachers, local government, police, community leaders, and the media.

School policies are another relatively neglected area in active school travel research, evaluation and practice. School policies can change behaviour directly and also indirectly by supporting social norms of active school travel as described above. Measures taken to reduce motor vehicle volume, speed and access around schools are direct behaviour change policies that also send the (social change) message that the safety of children walking and cycling to school has higher priority than motor vehicle through traffic around schools.

Another example of supportive school policies is the provision of readily accessible, secure bike parking at school, which has been shown to increase cycling to school in Victoria (Garrard et al., 2009). Once again, the change process is likely to involve both direct and indirect mechanisms. That is, directly by improving bicycle security, and also indirectly by sending the message that the school supports cycling to school, and that an increasing number of children are cycling to school, as evidenced by the well-used bicycle storage area in a readily accessible area in the school grounds.

As occurs in Japan, Zurich, Munich and several other high active school travel countries in Europe, there may also be a role for state education, planning, transport and law enforcement authorities to develop policies and guidelines that support active school travel and improve traffic safety around schools.

The proposal by Faulkner et al. (2010) that parents' decision-making about mode of travel to school is a two-step process, with different factors influencing independent/escorted travel (Step 1) and travel mode (Step 2), provides an opportunity to more effectively target parental barriers to active school travel.

In Step 1, traffic safety and social safety are important considerations. Traffic safety includes all four components of the Safe System approach to road safety, including the child's capabilities and skills for walking or cycling safely on footpaths, trails and roads. Both schools and parents have a role in providing children with the skills and experience needed for safe, independent active travel (Garrard, 2016).

The other crucial component of safe road users is safe drivers. Increasing the responsibility of drivers for the safety of child pedestrians and cyclists is likely to improve actual and perceived road safety. Parents are aware of the benefits, but also the limitations, of children acquiring safe walking and cycling skills. Knowing that drivers are also looking out for their children provides an additional layer of safety and perceived safety.

Safe roads, safe speeds and safe vehicles are the other three components of the Safe System approach, and improvements can be made in all these areas to increase the safety and perceived safety of children walking and cycling to school.

Another aspect of parents' Step 1 decision-making is non-parental accompaniment. This is an under-researched area, though the available evidence indicates that children who travel to school independently frequently do so accompanied by friends or siblings (Carver et al., 2014; Garrard et al., 2009). In some cases, parents who live nearby might share accompanying their children to school, though there appears to be little data on these informal walk-to-school groups. While there is limited research on these forms of accompaniment, it seems likely that non-parental accompaniment may reduce parents' concerns about social safety. Support for these forms of accompaniment is therefore likely to increase parents' scope for permitting independent travel to school.

Another recent development with the potential to influence Step 1 decision-making is the use of mobile technology to: (a) monitor children's movements en route to and from school; (b) notify parents when they arrive at school or home; and (c) enable children to seek assistance in the event of an incident on the way to or from school (Faulkner et al., 2010). The Ride2School program conducted by Bicycle Network Victoria is currently trialling the use of an "Active Tag" swipe card which students touch on at school to record their active trip to school. The Ride2School program is also aiming to introduce email functionality which will inform parents that their child has successfully arrived to school (https://www.bicyclenetwork.com.au/general/programs/2283/).

These technological innovations address parents' desire to know that their children have arrived safely, and their availability and use may assist parents to allow their children greater independent mobility on the trip to school (Faulkner et al., 2010). In their study of 'parental fear', Crawford et al. (2015) reported that parents were more likely to allow their child independent mobility if they provided their child with access to a mobile phone, though the directionality of this relationship is uncertain. As noted above, this study also developed comprehensive guidelines for parents: "*How to help your kids get around safely*

on their own" (https://www.vichealth.vic.gov.au/media-and-resources/publications/parental-fear).

Step 2 in the active school travel parental decision-making process involves travel mode selection based on parents' prior decision regarding independent or parent-accompanied travel to school. Most independent travel to primary school is active (mainly walking or cycling), but parent-accompanied travel can be active or inactive. In the context of increasing children's rates of active travel to school, the key consideration here is understanding parental supports and barriers to walking or cycling to school with their children, which include parents' perceptions of the advantages and disadvantages of car travel.

These factors are numerous, and are described in more detail in the full report. Factors can be categorised into those that support and constrain walking or cycling to school with children, and those that support and constrain driving children to school. Some of these factors are amenable to change and others are not. Examples of potentially modifiable factors (ie excluding a number of socio-demographic factors) are included in the full report.

6 CONCLUDING COMMENTS

Active travel to school is an important source of regular physical activity for children, however Australian children's rates of active travel to school have declined markedly in recent decades. In the 1970s the majority of children walked or cycled to school, but currently, most children are driven to school (Garrard, 2011; Australian Bureau of Statistics, 2013).

Rates of active travel to school among primary school age children in Australia and South Australia are among the lowest in OECD countries. Most active trips to and from school are for walking (about 22% of trips to and from school), with a small number of trips by bicycle (about 2-3%).

Parents and carers are the key decision-makers for primary school students' mode of travel to school. It is therefore important to identify the factors that support and constrain parents' decisions to use active or inactive modes of school travel.

Walking and cycling to school are seemingly simple activities, but the factors that influence these behaviours are complex. The social-ecological model of school travel mode choice (see Figure 1), which describes four mutually interactive domains that influence travel behaviour (intra-personal factors, and factors within the built/natural, policy/regulatory, and social/cultural environments), provides both an explanatory model and a framework for developing interventions aimed at increasing rates of active travel to school, including independent and parent-accompanied active school travel.

Policies and programs aimed at increasing active travel to school can be directed at (a) changing parental behaviour directly by focussing on intra-personal factors such as parents' perspectives, attitudes and expectations, and/or (b) changing the physical, policy/regulatory, and social/cultural environments that influence parents' and children's travel behaviour. The full report contains more detailed information on these potential

interventions, incorporating measures that have been demonstrated to be effective as well as those that show promise of potential efficacy through addressing the parental barriers to active travel to school that have been identified in this review.

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