

# Pedalling for safety: Schoolchildren and Safe Active Transport

Kylie Fisher

Dr Maxine Campbell

Department of Societies and Cultures

Faculty of Arts and Social Sciences

The University of Waikato

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Project Concept and Research Design

Kylie Fisher,<sup>1</sup> Dr Maxine Campbell<sup>2</sup>

Research

Kylie Fisher

Report Text

Kylie Fisher and Dr Maxine Campbell

Supervision

Dr Maxine Campbell

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The authors may be contacted *via*  
Dr Maxine Campbell  
Department of Societies and Cultures  
Faculty of Arts and Social Sciences  
University of Waikato  
Private Bag 3105, Hamilton  
New Zealand  
Email: maxine@waikato.ac.nz

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<sup>1</sup> Graduate Student, Department of Societies and Cultures, Faculty of Arts and Social Sciences, University of Waikato

<sup>2</sup> Lecturer, Department of Societies and Cultures, Faculty of Arts and Social Sciences, University of Waikato

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# CHAPTER 1: INTRODUCTION

## Introduction

This research will add to the international body of knowledge around safe active transport and its benefits for individuals and their communities. In order to achieve this, the report begins with a brief description of the risks associated with active transport,<sup>3</sup> and considers why active transport to school should be encouraged, despite the risks. Our dependence on cars is discussed in relation to the prevailing chauffeuring culture, before the objectives of the research are outlined. Chapter one concludes with an account of the methodology used to undertake this research, which combined a literature review and a search for educational resources with some participant observation field research.

In chapter 2 we present a summary of the resources available to parents in Hamilton and provide a profile of the city, which is in many ways ideally suited to active transport, though participation rates are low. There follows an overview of strategies and initiatives currently operating in Hamilton to facilitate safe active transport, as well as outlining other strategies operating nationally. We also outline some overseas initiatives, which have been replicated to some extent in New Zealand. One of these, the cycle train offers considerable promise.

Chapter 3 discusses the benefits of active transport and the barriers to participation in it. In doing so, it moves from personal benefits (such as the health benefits of regular exercise) to public or community benefits (such as safer, more cohesive communities). These benefits are often directly connected to some of the barriers preventing children from participating in active transport. These barriers include traffic congestion, infrastructure, and issues such as distance to school, safe routes to school as well as road user attitudes. We also address a common misconception related to the idea that there is safety in numbers.

Following a discussion that draws all the various strands together, we evaluate existing strategies with a view to endorsing those most likely to enhance safety, while also offering some further ideas on how to minimise the risks of active transport for children.

## Preamble

All individuals, groups and organisations involved with the care of children recognise the delicate balance that must be achieved between keeping our children as safe as possible, while at the same time encouraging them to develop as active, healthy and responsible individuals. It is important to reduce the risk of accidents because “injuries affect the quality of life of millions of children, young people and their families

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<sup>3</sup> Active transport is transport such as cycling, walking, skating etc.

within Aotearoa/New Zealand” (ACC, 2005, p.7). It is also important to encourage healthy lifestyle choices in order to ensure a continuing good quality of life. Active transport provides the opportunity for a healthier lifestyle in terms of increased exercise, but it is also regarded as an activity that generally involves a high level of risk. For example, “pedestrians account for 28% of New Zealand’s urban road toll and \$290 million in social costs annually” (Newbury et al. 2008, p. 1). This suggests a further balancing act is required in as much as the many benefits associated with active transport will be overshadowed or lost unless the level of risk associated with walking or cycling is managed. Hence risk-minimising and benefit-maximising strategies and initiatives need to be encouraged, developed and implemented to allow children to safely participate in such activities.

The risks associated with children and active transport include serious injury and death. In the period from 2001 to 2005, a total of 928 injury crashes for child cyclists aged 5 – 14 years were recorded by NZ Police (Safekids, 2005, p.2). All these crashes involved a motor vehicle and occurred on the road. Kingham, & Ussher report that “among children aged 11–14 years, pedestrian injury by motor vehicle leads to twice as many deaths as does leukaemia, four times as many as does asthma, and five times as many as do all infectious diseases combined” (2007, p.504). While such comparisons indicate significant levels of risk, they can also mislead and it is more instructive to compare active transport injuries to other types of accidents, rather than to illnesses, if only because accidents are inherently preventable. Indeed the level of risk tends to be overstated somewhat, and Mackie (2009) notes that “on a per trip basis the risk (of accident) is small and in New Zealand (children) in the 10-14 year age range are more likely to drown than be killed in a cycling accident” (p. 4). This suggests that ultimately, the development of strategies and initiatives to reduce risks and further enhance safety could encourage greater participation in active transport and the many benefits associated with it.

### Chauffeuring culture

Despite the low injury and fatality rates, general perceptions of the risks of cycling or walking result in more children being chauffeured to school by their parents or caregivers. The Ministry of Health found that in 2006/07 the “private car (56.4%) was the most common way for children in New Zealand to get to and from school (p.42). A further 18.5% travelled by bus and a small percentage (3.6%) by other types of public transport (MOH, 2007a, p.42). The remainder (23.5%) walked, biked or skated to school. Overall, the figures in the Ministry of Health report (2007a) track significant changes in children’s mode of travel to school and represent growing transportation and health problems. Among the disadvantages associated with the current chauffeuring culture is that it can put children at further risk. Many writers note that chauffeuring can be ‘counter-productive’ because it indirectly puts children entering and exiting the school gates in further danger (Collins & Kearns, 2001). This is because the danger for child pedestrians increases as the number of vehicles trying to drive to and from school at the same time increases. The situation is exacerbated as more cars are parked on the streets because parked cars minimise

the space available for children to cycle. Moreover, parked cars present further danger because they can create field of vision barriers for both cyclists and motorists.

Despite the growth of a chauffeuring culture, there is amongst children “a demand for cycling to school” (Mackie, 2009, p. 9). Mitchell, et al. (2007) found that in Auckland, “those children that cycled to school wished to persist with it because cycling was fun, and faster than walking and less boring than private transport” (p. 619). Thus cycling could be a popular, healthy and effective transportation mode to school, with long established benefits for both the individual and the community. Active transport such as cycling “is one of the most efficient means of transport known to man in terms of energy requirement to propel it. It produces no poisonous fumes; it is quiet and does not consume valuable non-renewable fossil fuel” (Bicycle Planning Committee, 1975, p. 1). Its benefits are endorsed by all manner of people for an extensive range of reasons: the “benefits of riding a bicycle whether for utilitarian or recreational purposes can be expressed in terms of improved environmental and personal health, reduced traffic congestion, enhanced quality of life, and economic rewards” (Bicyclinginfo.org, 2009). Indeed, the leader of the western world, President Obama identifies cycling as part of the solution to issues as diverse as “health care, obesity, energy and environmental policy” (Sani, 2008, p.1).

These are all benefits that will improve the quality of life for every New Zealander and this research examines the benefits and risks of active transport in some detail, with a view to enhancing the balance between assuring children’s safety and encouraging their physical, mental and social development. It also offers recommendations as to how to reduce the risk of accidents whilst building and maintaining a strong active transport culture. In doing so, it endorses the notion that “injury prevention focuses on changing unsafe environments, changing unsafe behaviour and changing unsafe attitudes” (ACC, 2005, p. 7) and attempts to address all three elements in varying degrees.

## Objectives of the research

It is anticipated that this research will be useful to the Hamilton community in the first instance, particularly when considering further programmes and initiatives to make active transport for children safer and more popular. The aim of this research project is to enhance the safe passage of children engaging in active transport to and from school. Achieving safer active journeys for children necessarily helps in achieving a secondary aim of the project, which is to increase the numbers of children who actively transport themselves to school. In order to meet these aims, the research proceeds primarily by identifying public and private barriers to active transport and in turn, suggesting remedial strategies. Along with identifying barriers preventing children from actively transporting themselves to school, factors contributing to child cycling accidents are identified, since safety concerns are a major barrier to active transport. The availability of existing parent and child educational resources on safe active transport is also investigated. While much of the focus of the project is on

conditions and practices within Hamilton city in particular, this is augmented with an examination of international practices and initiatives.

The research therefore attempts to identify gaps in existing information at the local level and seeks assessments on how effective and popular any past or existing initiatives have been both in Hamilton and further afield. Finally, the project aims to identify possible solutions to the existing local safety hazards and barriers for children's participation in active transport to and from school. To reach these objectives an extensive literature search was completed, local, national and international initiatives were explored and some minor field work was undertaken locally. These elements are discussed below.

## Methodology

### ***Literature search***

There is a vast amount of international and national literature on traffic safety in relation to active transport. The literature covers a large range of issues surrounding safe active commuting to school, encompassing those with a public dimension, such as environmental impacts, community impacts, policy changes associated with active transport, traffic congestion, infrastructure, education, and drivers' attitudes towards cyclists. In addition, the literature also discusses factors of a more personal nature, such as the health benefits of active transport, the child's ability and attitudes, parents' convenience, along with possible policies which can encourage safe active transport. The primary literature search utilised a range of key words and phrases derived from initial readings and discussions with colleagues. Some key words related directly to the activity (cycling, cycle trains, walking buses), and some to barriers and hazards (child accidents, cycle accidents, bike accidents). Similarly, they could be grouped into ideas associated with the public domain and private domain as explained above. The literature search produced material offering a broad background knowledge of the topic, as well as many resources that related to this project. There is for example, a vast array of relevant resources for children in the Waikato School of Education library.

Further information was obtained from Safekids New Zealand, who are "the recognised experts in unintentional child injury prevention. ... [Safekids] provides valuable information, services and advice to government agencies, territorial authorities, well childcare providers, health professionals, private industry, media, educators and families" (Safekids, 2009). Safekids maintains a comprehensive reference library containing reports, papers, articles and resources relating to all child accidents in New Zealand. As in the past, they readily responded to a request for references.<sup>4</sup> From the resulting extensive list of references, I selected the most

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<sup>4</sup> Safekids New Zealand has provided support assistance to Waikato Summer research students for a number of years, for which the Department of Societies and Cultures is much indebted.



relevant and recent articles and reports, which Safekids then forwarded to me, along with some extra *facts sheets* and children's hand-outs that they thought would be important to the project.

I also conducted a search of the Hamilton Public Library catalogue, using the same search methods as those described above, although this search did not produce many resources that would be useful to this project. Additionally, this task was also useful in providing an insight into how readily available resources are to parents. This is discussed further below.

Finally I conducted several Internet searches for both parents' resources and further information on child traffic safety, accident statistics, national and Hamilton cycle strategies, and international examples of progressive cycle safety policies. I also used the Internet to augment any topics on which my original searches did not produce sufficient information. These Internet searches were particularly useful in finding information on current programmes and initiatives that support child safety and active transport, as well as policies that promote active transport at the local, national and international level. Thus the literature presents both a world-wide and local perspective on safe active transport and the related barriers and potential solutions. I was able to find several articles, reports and web pages that are Hamilton specific which have been particularly useful to this project.

The information from these sources was collated, analysed and divided into relevant sections and themes. However, whilst dividing the data into the various themes, I found that there are many overlaps, and this topic does not lend itself to a simple description any more than it does to a simple solution. Thus the literature review and internet information is interspersed throughout the report, informing both descriptions and discussions.

### ***Field work***

In addition to the literature search I engaged in some minor field work – participant observation. The first element of this was the trip to Hamilton's Public Library (mentioned above) to test how easy it is to access resources for parents who do not have access to Waikato University Library or the World Wide Web. I found very few books or resources regarding children's safe active transport and a limited number on safe cycling in general. I thought this would be disheartening for a parent trying to find resources to become more knowledgeable on the topic or to help them teach their children about traffic safety.

Secondly, I spent a number of mornings and afternoons between the times of 8:30a.m. to 9:00 a.m., and 2:45 to 3:00 p.m. walking and/or cycling to four of the local schools in or near the suburb of Nawton in Hamilton. I chose these times because studies have shown that child cycle accidents correspond to school starting and finishing times (Newbury, Hsiao, Dansey, Hamill, 2008). Similarly, the Ministry of Transport (2009) found accidents involving child cyclists (18 years and younger) and motor vehicles are more likely between 8:00a.m. to 10:00a.m. and 2:00p.m. to

6:00p.m. The field work was important to this research because it facilitated an experience that was as close as possible to the experiences that a child would have when cycling or walking to and from school. Subsequently, I believe my first hand experiences have significantly influenced my perception of cycling in the city. These experiences are scattered throughout this report in order to add an extra layer of insight of Hamilton-specific experiences.

Lastly, late in the research process, it occurred to me that I had never seen children cycling in high-visibility clothing and decided to check its availability. Accordingly, I undertook some further field research in as much as I canvassed a number of bike shops in regard to child cycle safety gear, particularly clothing.

## Chapter 2: Cycling in Hamilton

### Resources

#### *Internet*

There are many useful resources available on safe active transport. The internet in particular, offers cyclists, parents and children a useful mechanism by which to share and access information, tips, hints and advice in regard to active transport. Many different websites offer such a diverse range of information on safe active transport that one can be overwhelmed by the avalanche of results one has to sift through after a *Google* search. This can be counter-productive since it can discourage busy parents from using the internet as an information source. In view of the wealth of information available online, a full accounting of it is not practicable here. Therefore, two of the most useful websites have been selected for description and discussion. The first is the Hamilton City Council website.

This website and associated links paints a picture of the positive consequences of a safe active transport oriented city. The website also provides relevant Hamilton-specific cycling information, such as the Hamilton *bike buddy* (see below) system, and the *cycle network* (also discussed below). The second website selected is Skidlidkids run by Nelson City Council, in conjunction with the Tasman District Council. Skidlidkids is aimed at children and highlights all the major dangers of actively commuting in a clear but encouraging manner. It also provides information on up-and-coming children's events regarding active transport, bike maintenance, helmet safety, road skills and practices, national programmes, and hot topics such as *cycle trains*. Finally there is a page for parents which specifically highlights the benefits of active transport. Therefore this website can potentially play an important role in educating both parents and children about safe active transport.

#### ***Books, pamphlets and fact sheets***

One cannot assume that all families have access to the internet, since it is an expense that is beyond the means of some families. Some parents may also have little experience using the internet. Therefore other ways of accessing information were explored. This is particularly relevant because socio-economic status features as a factor in both accident and participation rates among children (Cerin et al, 2009). The University of Waikato's Education Library has a surprisingly large collection of resources on safe transport, many of which are aimed at young children. They present clear, fun messages for children, such as Uncle Anzac's *Kapai's Keep Safe Road Code* published by New Zealand Land and Transport Safety. This book has comprehensive information for children about safe active transport and has a particular section on basic bike rules, skills, equipment and maintenance. The book also has a section called *advanced bike rules* which contains useful information for both parents and children.

Amongst the other books available are titles such as the St John's *Child Safety Handbook: A Guide to injury prevention for parents of 6-12 year olds*, which has a section on being 'street smart' or the Land Transport Safety Authority's, *The Safe Cycling Book*. This book "is all about explaining cycle skills and road rules that are required for children to be a safe cyclist" (p.3). Both of these books are easy for children to read and offer a full range of cycling information, which can enable parents to successfully teach their children correct road and cycling safety rules and techniques. The last book of note is written by the New Zealand Police, (2006) called *Helping Hands: Helping to keep children safe on the road. A guide for parents and caregivers*. This is a resource that can be very helpful to parents over many areas of road safety. It highlights why road safety is important for parents to teach their children, as well as how to do it. The book explains the difficulties children may have dealing with traffic, and recommends walking with the children to school when they are very young, holding hands, showing them correct safe road behaviour and encouraging them to practise safe behaviour, as well as selecting safe routes and equipment.

As explained earlier I went to the Hamilton public Library to find out how many resources they had available on the topic. Again, this is an important exercise because not everyone has access to the University Library – or would think to use it. There were very few relevant resources in the Hamilton Public Library. I was able to find some books on safe cycling that were oriented towards adults (e.g. *Cycling for Fitness* and *The Bicycle Book*). These books are primarily written for adults, but parents who are new to cycling could find them useful because they highlight many important aspects of safe cycling, such as required equipment, safety gear as well as hazards such as congestion, junctions, conflicts, roundabouts, cycle lanes, and road surfaces such as railways and speed bumps. Nonetheless these books are aimed at adults and do not consider many of the unique safety challenges that children face on the road.

A further possible source of information for parents is one of the Automobile Association (AA) outlets dotted around New Zealand. The only information the local AA shop offered was a New Zealand Transport Agency handout on road rules and cycling equipment. It is a single page double-sided handout with basic information and tips, although it is not aimed at children. Additionally, Safekids New Zealand provided some examples of past resources for parents and children that they keep in their reference library. These resources offer pointed clear messages about safe active transport and would be useful to parents and children alike. Unfortunately, they are not readily available to parents in Hamilton. One such resource is a handout entitled, *Got a Bike? Be Smart, Be Safe, Be Seen*. It is available in different languages (Maori, Pasifika and Asian languages) and has basic information for children who cycle. The messages are simple and effective:

Be Smart: working on bike skills, planning safe routes, and knowing road rules,

Be Safe: Helmet, Bike safety, right size,

Be Seen: Bright clothing, reflector, bike light.

Another source that is available in many different languages is Land and Transport New Zealand's *Being Road smart for school: Best choices for our children*. This resource reminds parents what to teach their children, as well as encouraging parents to show their children rather than just tell them. The *Bike Wise* handout available from Safekids, *Hey Cyclists! Hey Motorists!* is a useful resource because it presents both the cyclists' and the motorists' perspective. This handout has two sides, one headed up "Hey cyclists" and containing nine points that cyclists should consider. The other side is titled "Hey motorists" and contains 10 points for drivers to remember. As noted above, many more resources were found during this research; only the most useful and relevant information for parents and their children is presented here.

## **Profiling Hamilton**

Hamilton has a relatively low commuter cycle rate, which is surprising considering that "geographically, generally Hamilton's roads are flat and wide, and there is also an increasing number of dedicated cycle lanes" (Hamilton City Council, 2009b). Over the past 30 years, the national transport policy trend has been to focus on motor vehicles as the main transport option, with little thought to alternatives such as cycling, and only minimal attention at times to public transport systems. Unsurprisingly, Hamilton regional plans, roading policies and transport strategies have also focused on private motorised transport and historically Hamilton has been a car dependent city. The effects of this are evident when one examines Hamilton's residential density. "Hamilton has a relatively low density at around 12 households per hectare" (Hamilton City Council, 2009d). Therefore destinations such as schools, shopping malls, and libraries are more likely to be further away, than in urban centres with higher population densities and their associated residential profiles – e.g. high rise apartments, town houses etc. "This is influential because the distance to a destination is a critical factor for choosing transport methods" (Gray, 2005, p. 6). The lower density and its accompanying urban sprawl tends to encourage motor vehicles as the preferred and most efficient transport choice. While distances in Hamilton are not excessive, the prevailing perceptions around distance and convenience reinforce the attitudes and habits of Hamilton residents as indicated by the fact that "70% of all car trips are 8 kilometres or less!" (Hamilton City Council, 2005, p. 20).

Grey (2005) argues that there are forces in Hamilton that make cycling even less attractive to the average person and they are factors which the city council cannot easily change. These are factors like the unpredictable nature of Hamilton's weather, which is likely to prompt commuters to choose covered transport modes, such as buses and private motor car. No statistical data are provided in relation to the weather however, and it is possible that the *perception* (as opposed to the reality) of unreliable weather prevents higher levels of active commuting. Some longitudinal research on weather conditions during key commuting hours would be useful.

Currently traffic volumes are rising faster than population growth (Hamilton City Council, 2009a), which has prompted a larger effort by the city council to counter propensity for motorised transport and encourage more active transport. Efforts include strategies such as dedicated cycle lanes slowly being added to main roads, and cycle tracks that provide the safest route for cyclists. *Share with care* paths<sup>5</sup> have also been established where appropriate. Public transport patronage was also encouraged through the introduction of the Orbiter bus service, which caters for the outer suburbs and was extended in July, 2009.

There are still many challenges for a cyclist in Hamilton, however. For example, in some cases “there is limited safe space for cyclists and hence a lack of connectivity on many arterial routes into the central business district and throughout the suburbs” (Gray, 2005, p. 7). I found this especially true when I cycled to and from schools. As a new cyclist I did not know the best routes to take and on some of the main roads, little space was available for me to safely cycle. My first cycling experience in the city involved me cycling on a major suburban route, Ellicott Road, where I had many cars drive very close to me. It took many cycle trips of exploring before I was able to devise the safest cycle route to and from the schools.

Hamilton’s efforts to encourage active transport are mirrored in varying degrees in other parts of the country. The following section presents a brief outline of some of the initiatives encouraging safe active transport, firstly at the local level, then extending to national and international strategies.

## **Hamilton strategies and initiatives**

### *Bike Buddy*

With this programme, the Hamilton City Council pairs up an experienced cyclist with a cyclist who wishes to begin commuting by bicycle. Wherever possible, the cyclists live in the same or a nearby neighbourhood and the experienced cyclist helps to identify the best routes to use, shares tips and tricks to cycling in the city and suggests the most appropriate type of cycle clothing and equipment.

### *Cycle parking*

Hamilton City Council has made an effort to establish many hundreds of cycle parks around the city in all the main destinations, such as shopping malls, where people work, libraries, pools, the zoo, and education institutions (Hamilton City Council, 2009b). Cycle parking is a way to make cycling around the city, seem simple and as a quick, easy and cheap alternative to a private vehicle. We note however, that in some cases the specific design of the cycle parks seems to be more concerned with aesthetics than with practicality. For example, it is difficult to stand a bike up on

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<sup>5</sup> Share with care paths, are footpaths that both pedestrian’s and cyclist are legally allowed to use.

some types of designs or the park is situated too close to the kerb, leaving very little safe space for the bike.

#### *Hamilton cycle network*

This is a project dedicated to making Hamilton safe and attractive to cyclists, through strategies such as allocating space for cyclists on the roads by developing cycle lanes, or widening footpaths to make them suitable for shared use, called cycle tracks (*share with care* tracks). Additionally the H.C.C has now marked quieter roads which link busier roads with tracks or cycle lanes to make cycling safer.

#### *Road Safe Fund*

Schools, community organisations and individuals can apply to the Road Safe Fund for financial assistance with a project focused on making Hamilton's roads safer. The grant is reserved for those projects not covered by Hamilton City Council's core responsibilities and the project must align with the council's vision of encouraging an array of transportation modes, along with enhancing road safety and improving the physical environment.

#### *Access Hamilton*

Access Hamilton is the city's primary transport strategy, which aims to create a "sustainable, integrated transport system for the city, supporting the Council's wider social, economic, and environmental objectives" (H.C.C, 2009c). The plan includes both infrastructure improvements and incentives to encourage the use of alternative travel modes. In recognising that widening roads and building alternative routes is not financially or environmentally sustainable, it instead focuses on alternative transport modes, including cycling (see above for discussion of improvements to Hamilton's cycle routes and bus services etc).

#### *Time Staggering*

Some primary schools that are situated near each other in Hamilton have adopted a time staggering strategy. This involves minimising traffic congestion by staggering the times school begins and end. For example, in the Dinsdale/Frankton area there are three primary schools that are all within approximately 2sq kms of each other. St Columba's School begins their school day at 8:45am and finishes at 2:25pm; Frankton Primary starts at 8:50 am, and finishes at 2:20 pm and Aberdeen Primary starts at 8:55 am and finishes at 3:00pm.

#### *Kids on Bikes*

People cannot bicycle if they do not have access to a bicycle, and studies show that the availability of a bicycle in a household is the strongest single predictor of bicycling for transportation (Cervero et al., 2009). Several different kinds of programs aim to increase access to bicycles, either through facilitating ownership or enabling temporary use of a bicycle. Hamilton has a programme called Kids on Bikes (K.O.B). The programme targets children from lower socio-economic backgrounds who may be facing weight challenges and/or low confidence. These children are offered the

opportunity to be part of a programme which is aimed at improving regular exercise rates, safety skills and bike maintenance skills. The programme requires the children to pass a safety and maintenance course. They are then able to earn 'bike dollars', so that after reaching 500 bike dollars they are allowed to keep the bike and safety equipment.

## **National strategies and initiatives**

### *Police School Road Safety Education*

Like the rest of New Zealand, Hamilton's schools also benefit from safety programmes provided by NZ Police. Specially trained police officers enter schools (from primary right through to secondary level) and deliver education on road rules, safety hazards and cycle skills. The Officer works with many different organisations including *Bike Wise*, city councils, and Land Transport NZ to ensure the correct and relevant messages are reaching our children.

### *0800 CYCLECRASH*

This is a service established to make cycling safer by enabling any cyclist to call at any time to report any problems that they may have encountered. Reports range from static problems such as potholes and overhanging branches to more immediate problems, such as bad drivers. The service will then do their best to follow up on the problems and in the process ensures a voice for cyclists.

### *Go By Bike Day*

Go By Bike Day is a national event organised by *Bike Wise*, which is dedicated to promoting and encouraging active commuting. Held this year on February 17<sup>th</sup>, cyclists travelled by bike to a central location (in Hamilton it was the Civic Square in the central business district) where they were rewarded with a communal breakfast. Similar events occurred in many other urban centres around New Zealand as a means of encouraging cycling in safe and constructive manner.

### *Variable speed zones*

Hamilton City Council has also implemented some national strategies to make active transport to school safer. A key strategy which has been implemented as 18 Hamilton primary and intermediate schools is the introduction of 40km/h variable speed zones around each school. This has multiple effects. In the first instance it reduces the likelihood of a child being struck by a vehicle and significantly reduces the level of injury in the event that a child is struck. The speed zones' existence also acts as a reminder to drivers to take extra care in the vicinity of the signs and alerts drivers unfamiliar with the area that there is a school nearby. School speed zones operate over specific time periods generally designed to coincide with peak traffic flows (35 minutes before the start of school and 20 minutes at the end of the school day), though they can also operate for 10 minutes at any other time of day when at least 50 children cross the road or enter or leave vehicles at the roadside.



The reason behind the speed restriction is to provide a safer road environment outside schools, reinforce driver expectations as to the likely presence of children in the area and encourage safe, active travel to school. The strategy has achieved a high profile, with the first Hamilton variable speed zone was launched on Tuesday 5<sup>th</sup> February, 2009 at Fairfield Intermediate School by Hamilton Mayor Bob Simcock and Minister of Transport Hon. Annette King (Hamilton City Council, 2009e). In principle, the strategy aligns with Tolley's view that of all the possible road changes the "most important is speed reductions to 30km per hour" (2003, p. 185) around school areas, though it would need to be lowered by 10kph to comply fully.

#### *School Travel Planning/TravelWise programme*

Under this programme, also supported by Hamilton City Council, a TravelWise team advocates for schools to ensure that all the necessary precautions are in place for children to travel actively to school. TravelWise deals with many different aspects of the built environment, using a range of measures to minimise congestion outside of schools. This may involve strategies to stop illegal parking and make access points safer. The TravelWise team also identifies safe routes to school and enforces Kea crossings (flags are put up during school patrol, to identify safe places to cross the road). Road safety education is a key platform which is used to encourage sustainable and safe active transport to school.

#### *Palmerston North Green Bike Trust*

This trust is based at Massey University and addresses similar problems. The trust recycles old bikes and then, rents, leases and or sells the recycled bikes. The trust also offers bicycle repairs with a wealth of spare bicycle parts (Massey University, 2009). Although aimed primarily at tertiary students, the trust is a means of overcoming some of the financial barriers to cycling in a sustainable manner and provides a model that might usefully be extended to other groups.

### **Safe cycling overseas**

#### *Safe Routes to School Project*

Similar steps have been taken overseas to improve routes to school. In 2005 the U.S devoted funding to the Safe Routes to School Project (S.R.T.S) after they recognised the numerous benefits associated with active transport to and from school. The S.R.T.S project combines schools, local government and the community's knowledge, along with regular evaluation to ensure a successful and safe environment for children to actively transport themselves to school. The projects involve a range of dedicated committees which take on specific tasks, such as the "enforcement and engineering committee, which develops recommendations for enforcement and engineering solutions" (Safe Routes to School, 2009). Similarly, the Traffic Safety Committee identifies unsafe driver behaviours and develops an education campaign to increase awareness. There is also a Mapping and Information Gathering Committee which obtains maps, collects information about

where children live, the routes they take to school and the condition of the streets along the way. All three of these committees have the capacity to minimise accidents on the roads for active transporters.

All aspects of active transport are covered. Some of the S.R.T.S strategies are extraordinary. For example, in Cleveland, Ohio, one of the school's "students stencilled their names in footprints they spray-painted inside newly painted crosswalks in the area. Not only is the decorated crosswalk visually appealing, it also increases the students' feelings of ownership in the project and draws drivers' attention to the need to watch for young pedestrians" (Safe Routes to School, 2009). A combined individualised and community approach such as this can make small alterations to the routes to schools which can reduce the risk of accidents and therefore encourage more children and their parents to participate in active transport.

Between 1985 and 2000, Denmark promoted active transport through a concerted programme of infrastructure improvements. These improvements included segregated cycle ways and footpaths, reallocation of road space away from cars in favour of pedestrians and cyclists, 20kmph (and lower) speed limits in residential areas, along with requirements for motorists to defer to pedestrians and cyclists at side roads and crossings. These investments in infrastructure have had measurable effects. "The number of children (6-16 years old) killed or injured fell by 46 percent; approximately half the reduction is put down to road safety and cycle route improvements" (Osborne, 2005, p. 237). Clearly, creating a safer physical environment for cyclists and walkers can significantly reduce accident risks as well encourage more children to participate in active transport.

### *Cycle Trains.*

Cycling is a mode of transport that has many personal and environmental benefits and it makes sense that children should be encouraged to cycle to and from school. Furthermore, cycling is often prescribed by sports medicine specialists precisely because it causes "less wear and tear on the joints and muscles than jogging (Harris, 1996, p. 271). Therefore cycling can be a way for people of all shapes and sizes to achieve the recommended level of daily exercise. In New Zealand however, a relatively low number of children cycle to school, despite New Zealand's temperate climate and the flat contours of many of its town and cities. Mitchell, et al (2007) reported in their study of primary school-aged children that while "few children cycled to school ... all of those who were cyclists wished to persist with this form of transport. (They stated) that cycling was fun and faster than walking, and less boring than private transport" (2007 p. 619). Clearly there is a demand amongst children for continuing and extended participation in cycling.

Cycle trains present one strategy which, if facilitated and supported correctly, could be utilised in Hamilton to increase the number of child cyclists and simultaneously enhance their safety. Cycle trains follow the approach used for the walking school bus,<sup>6</sup> where adult conductors walk along a set route to school collecting children from

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<sup>6</sup> A programme aimed at children to allow them to safely walk to school in a supervised setting.

designated bus stops. Thus a “cycle train is essentially a walking school bus on bicycle wheels” (O’ Fallon, 2007, p. 11). The preferred adult: child ratio in a cycle train would depend on the children’s ages and skills, the nature of the route, and the confidence of the conductor” (O’Fallon, 2007, p. 30). The recommended age of children on cycle trains is “10 years or older” (O’Fallon, 2007, p. 23), though in practice, the most common participant (30% of participants) was just 8 years old in a trial held in Nelson (O’ Fallon, 2007).

Given the cost and time involved in upgrading a city’s physical roading environment to make cycling safer, cycle trains present an immediate alternative which can encourage children to cycle while minimising the risk of accidents through adult supervision and careful selection of the safest routes to school. An added bonus of the scheme is that as more children begin to cycle to school, the need for safer cycle tracks may become more obvious to drivers and the city council. “The presence of large numbers of bicyclists may also help underpin their legal use of roadways and intersection crossings and generate public and political support for more investment in bicycling infrastructure” (Pucher, Dill & Handy, 2009, p.16).

There are other, less obvious benefits of cycle trains in terms of creating a safer environment for child cyclists. Research has shown the presence of children on the road can positively influence motorists’ driving behaviour. A cycle train could therefore make cycling to school safer because of its greater visible presence and motorists can become more aware and cautious of a cycle train in comparison to individual cyclists. Secondly, a cycle train minimises the “stranger danger” risk because children are together in a supervised environment. Thirdly, it has been found that demonstrated behaviour can be an intervention in itself, and cycle trains can be a way for parents and other authority figures to demonstrate correct and safe cycle behaviour.

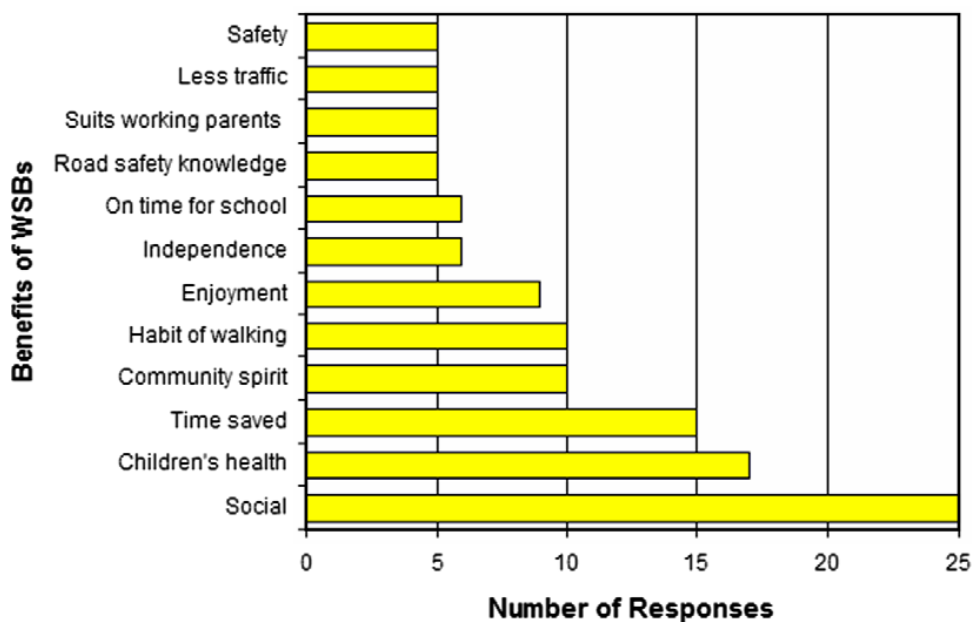
Cycling to school (rather than walking) also overcomes some of the issues regarding distance. O’Fallon (2007) reported that “walking school buses mainly appeal to those living up to 1 km or not much more than one km from the school” (p. 11). However, cycling can get a child to their destination much faster and with less effort so that while 2 or 3 kilometres is too far to walk, it is an easily managed cycle ride.

The usual process for establishing a cycle train route involves the co-ordinator or conductors cycling the route and paying particular attention to how children would experience various aspects and hazards; this is called a hazard audit (O’ Fallon, 2007). It generally takes about 15 hours to set up a cycle train in one school, with the hazard audit and contacting the parents being the most time-consuming elements (O’Fallon, 2007). Once the safe route to school has been selected and all possible hazards have been identified, the cycle train would use the same route every day, thereby alleviating some parental concerns around both road safety and personal safety. As Timperio et al (2006) note “parents may feel more comfortable if other children used the same route” (p. 49).

Cycle trains can be viewed as social support that safely facilitates active journeys to school, as well as offering on-the-road training for children who will eventually travel

alone (O’Fallon, 2007). They can also be a way to get older children interested in active transport. It has been found that cycling is more popular for older children who want to gain more independence (O’ Fallon, 2007). “By going through the cycling stages – for example, learning how to cycle, riding on the road in groups – parents and children become more confident about individual cycling” (O’ Fallon, 2007, p. 35). Furthermore, cycle trains can “empower children to get out on the scary road” (O’ Fallon, 2007, p. 33) and learn a new independence that is generally denied with the current chauffeuring culture. “Participation on a cycle train ensures that children reaching the age of 10-11 are able to independently and safely ride their bikes on the road” (O’Fallon, 2007, p. 38). The benefits of cycle trains are similar to the benefits of walking school buses, which Kingham and Ussher (2007) evaluated in a survey involving families who participated in the walking school bus in Christchurch. Their findings are presented below.

**Reported benefits of Christchurch Walking School Buses.**



(Kingham & Ussher, 2007, p.503)

The graph indicates that the social benefits of walking school buses in Christchurch significantly outweigh the other benefits identified by the families in Kingham and Ussher’s survey. Thus, it could be argued that the organisation of collective active transport offers *social* benefits not just for the children but also for the parents and ultimately this enhances the local sense of community. Improvement in children’s health was the next most often cited benefit. Interestingly, the third most common benefit was time saved. Many parents resist active transport on the grounds that they do not have time/it is not convenient, but this survey suggests another

misconception is operating. While further investigation of this aspect is warranted, in terms of the social aspects of walking buses, it is not unreasonable to assume that other types of organised active transport, such as cycle trains, will have similar benefits.

“As more and more countries embrace cycling as a path to health and economic improvement” (Kypri & Wright, 2000, p. 7), cycle trains increase in popularity. There are cycle train programmes running in the United Kingdom, America and countries such as the Netherlands and Denmark. Flanders, Belgium has the most widespread cycle trains. For example “during the school year 2001-2002, 172 cycle trains were registered; and by the school year 2004-2005 a total of 317 trains were registered, with an average of four trains per school” (O’Fallon, 2007, p.3). This indicates that cycle trains can generate support which in turn further enhances safety. In New Zealand, there are just a few running cycle trains, one of which is in Nelson. Nelson City Council successfully supports cycle trains as a sustainable and safe means of transport for children. They have a school travel planner who is responsible for the co-ordination of the cycle trains within Nelson (Nelson City Council, 2009) and provide a model which could usefully be transposed into Hamilton if facilitated and supported correctly.

## Chapter 3: Benefits and barriers

### Personal Benefits of active transport

#### *Health*

Throughout the western world obesity has become such a significant problem that the World Health Organization (WHO) (2000) regards it as a global epidemic, one to which New Zealand has not been immune. The 2009 *Social Report* informs us that “in 2006/2007, New Zealand’s unadjusted rate was 26.5 per cent, compared to an OECD median of 14.9 per cent. Out of the eight countries that use actual measurements (rather than relying on self-reporting), New Zealand had the second highest obesity rate after the United States (34.3 per cent in 2006), and a similar rate to the United Kingdom (24.0 per cent in 2007) and Australia (21.7 per cent in 1999” (MOH, 2009a). The health effects of obesity include reduced life expectancy diabetes, kidney failure, urinary incontinence, joint deterioration, high cholesterol, and heart disease, all of which can significantly increase the cost of health care for the government. Active transport offers a simple, effective means of beginning to lower our obesity rates, and it is significant that increased obesity and coronary heart disease “cost more lives than lives saved by avoiding accidents through reducing cycling rates” (Kypri and Wright, 2000, p.3).

Obesity affects all New Zealanders, including children. Figures for 2006/07 show that ‘one in 12 children (aged 2-14) were obese and one in five children (20.9%) were considered over weight (MOH, 2007a, p.1). Children who are relatively heavy at age 5 or 6 are at significantly greater risk of obesity in early adulthood than are children whose size is average or lean (Kitzmann, Dalton, & Buscemi, 2008). There are multiple factors underlying our rising obesity rates and the inter-relationships between the factors can be complex. Taken together however, the range of factors implicated in the obesity epidemic can be broadly categorised as “lifestyle” factors. Cerin, Leslie and Owen (2009) have attributed the rise of obesity to social and technological changes that affect behaviour. These include the advances in labour-minimising technology, the over-consumption of high-calorie convenience foods, and lack of time and effort invested into physical exercise.

The practice of privately chauffeuring children to school contributes to the childhood obesity epidemic because it reduces a child’s opportunity to exercise regularly. Beaulieu notes that children and young people are now “recommended to take part in at least 60 minutes of moderate to vigorous physical activity daily in order to promote and protect healthy heart function, ... and reduce the risks of obesity” (2008, p. 8). Kypri & Wright report that “the most effective exercise prescriptions are activities that integrate easily into everyday life” (2000, p.4). Therefore active transport – such as walking or cycling to work or school – can provide an ideal means of integrating long-term, sustainable exercise regimes into daily routines (Tolley, 2003). Furthermore, Pont et al (2009), along with many other writers, concluded that “children who use active transport to and/or from school are more physically active, have higher levels of energy expenditure and are more likely to meet physical activity guidelines than children who are driven to school” (p. 849). That is, higher physical activity levels

appear to be sustained throughout the day in children who cycle or walk to school and they subsequently have overall higher levels of daily physical activity when compared with children who are chauffeured to school.

There are various programmes around the country designed to encourage children's participation in physical activity, such as the *push play* campaign which is aimed at informing parents about the recommended 60 minutes of physical activity (SPARC, 2008). Similarly, *Project energize* aims to "deliver green prescriptions, which involve the prescribing of a physical activity programme to children and youth who are at risk of suffering adverse health effects from being overweight or obese" (Blair, 2004, p.7). Project energize is part of many Waikato primary schools and helps schools identify what they do and how they could do it in a healthier active manner. Of most relevance to this research is the *Kids on Bikes* scheme, discussed above.

### *Child Development*

Kingham and Ussher (2007) point out that "there is a relationship between participation in physically active lifestyles and the physical, psychological and social health of children" (p, 503). Regular physical activity is not only beneficial in fighting obesity and all the physical side-effects of being obese. There is now widespread acceptance of the ability of physical activity to promote improvements in self confidence, emotional stability, and independence, and to reduce feelings of anger, anxiety, depression, tension and confusion (Smith, 2001, p. 6). In addition to these psychological benefits, Yeung, Wearing, & Hills (2005) note social advantages in as much as active transport can "enhance social interaction and maturation of children and promote independent mobility" (p.895). Thus good physical health influences a child's learning outcomes and social skills possibly through to adulthood.

Active transport to school can play a vital role in educating children about their environment and the safe practices that will ensure their individual safety. Beaulieu, (2008) explains how "cycling or walking around local areas increases young people's spatial and local knowledge, as well as enhancing problem solving skills and environmental awareness of fauna and flora" (p.10). Passive transport or chauffeuring children around unnecessarily can minimise a child's opportunities to build vital knowledge, such as how road rules operate, how to interact with fellow active transport participants (as well as passive transport commuters) and how their environment is constructed. Furthermore, timing is crucial. For example, O'Fallon (2007) argue that many children lose interest in being told what to do as they get older, so it is important to use this window of opportunity while children are you to impart "education to produce good life-long habits and skills" ( p. 34).

## **Public benefits of active transport**

### *Community*

In addition to the benefits for individuals outlined above, further benefits accrue to the entire community when it is oriented around active transport. Tolley (2003) argues that private motorised transport contributes to "community severance"; the consequence of this is that people find themselves separated or isolated from their

community. Thus one of the most progressive benefits is the fact that as participation in active transport increases, an individual's social capital and connectedness within the community will grow, as demonstrated in Swedish research (see McMillian, 2006) and reinforced by Kingham and Ussher's (2007) survey of walking bus families. Furthermore, the presence of children in public spaces may also possess wider societal benefits, such as contributing to a sense of community, feelings of trust, and mutual support (Mitchell, et al., 2007). Tranter and Pawson (2001) state that communities can be enhanced through encouraging the use of public space by children, as their presence often helps to break down barriers between adults, and makes the streets more interesting, liveable and communal" (cited in Mitchell, et al., 2007 p. 615).

Finally, as more motorists participate in active transport, there will be more people on the streets. This presents several benefits for the community, including a community where a higher percentage of motorists are likely to also be cyclists themselves. This may help form a community of motorists and cyclists who understand and respect the needs of both cyclists and motorists (Pucher, Dill & Handy, 2009). This necessarily helps to generate a safer road environment. A further benefit of increased numbers of active commuters is the fact that "the presence of large numbers of bicyclists may help underpin their legal use of roadways and intersection crossings, and hence generate public and political support for more investment in bicycling infrastructure" (Pucher et al., 2009, p.16). A final benefit of increased numbers of active commuters is the reduction in the number of private cars on the roads, which would again make active commuting safer for both adults and children.

### *Environmental issues*

Cycling is an efficient transport mode in terms of its use of road space and energy resources; furthermore active transport is ecologically sound and can satisfy the desire for physical fitness through exercise (Auckland Regional Authority, 1987, p.7). Active transportation can be a small lifestyle change for each individual, but it can have exponential effects in terms of reducing greenhouse gas emissions. Motor vehicles are significant contributors to greenhouse gases – "each car in its lifetime produces 2043 million cubic metres of polluted air" (Hamilton City Council, 2005). Chauffeur children to school contributes to air pollution, traffic congestion and the depletion of non-renewable energy supplies. By contrast, active transport produces no emissions, nor does it burn fossil fuels.

Unfortunately children are one of the most susceptible groups to the effects of pollution (Kingham, & Ussher, 2007). Regrettably, while bicycles produce no emissions, cyclists are often at higher risk of health problems related to the emissions of the vehicles amongst which they cycle. "Anecdotal New Zealand based evidence suggests that as much as 20-40% of the early morning traffic stream is a result of parents dropping their children off at school" (O'Fallon, 2007, p. 11). Air pollution around schools necessarily intensifies at peak travel times and the quality of the air near schools can be worse than other streets because short car journeys can be the most polluting (Sustrans, 2003). Thus, if more children and their parents participated in active transport to and from school air pollution near and around



schools would be reduced and many health risks associated with air pollution would be minimised.

### **Barriers to safe active transport**

Clearly, there are good reasons to encourage active transport and a range of programmes have been introduced to meet this goal. None-the-less, cycling and walking have been identified by many writers as among the most risky transportation modes for school children. As noted earlier, the perception does not necessarily match the reality, but this remains one of the key barriers to increased active transport by children. Kypri & Wright (2000) argue that it is the *perceived* risk of injury which prevents parents from allowing their children to participate in active transport and the following section will discuss this and other barriers that prevent children's safe participation in active transport to and from school.

Much of the literature acknowledges that increasing active transport is a multi-faceted challenge that requires a comprehensive community approach. As Wendel and Dannenberg (2009) point out, making a change in children's transportation modes will require coordination among health, transportation, education and communities as well as cooperation with parents and children. Moreover, many writers have highlighted the need for more cross-ministry integration in the decision-making process to ensure cycling is encouraged and facilitated in a safe and effective and consistent manner. The various physical safety elements that can prevent active transport are covered here in no particular order.

#### *Traffic congestion*

Many studies have found that congested traffic, along with busy roads with high speed limits contribute to parents not allowing their children to participate in active transport. There is an increased risk of injury associated with high speeds and congested traffic, so it is not surprising that it prevents active transport to school. Given that 90% of crashes happen in 50kph speed zones, it is clear that the urban environment is presently unsafe for cycling children (Safekids, 2007). Additionally, the risk of an accident becomes higher when one considers a child's limited experience with busy roads, negotiating traffic and making fast, safe decisions.

Significantly, in New Zealand, the Ministry of Health (2007a) found that 23% of parents reported busy traffic and the need to cross main roads as barriers to children's participation in active transport (p.44). The first time I cycled to school in the city (as a 22 year old!), I found it very intimidating and dangerous, especially when it came to crossing Ellicott Road, a busy arterial route in Hamilton. Schools are a significant generator of localized congestion. There are morning and afternoon peaks as parents chauffeur their children to and from school. This congestion causes problems with traffic flow on the streets near schools, and can potentially create hazardous conditions for children and adults travelling by non-motorized means (McMillian, 2006). Safekids (2007, p. 2) found that crashes involving child cyclists and cars "peaked between 3pm and 4pm (23%) and 8am and 9am (20%).

Traffic calming has been identified by many researchers as an effective but passive environmental intervention to minimise risk, and make active transport to and from school safer. It is worth noting that Ian Roberts, an expert on child pedestrian injury, has concluded that “if the money spent on traffic education, was spent on traffic calming, children’s lives would be saved (cited in Kypri & Wright, 2000, p. 6). Traffic calming, involves measures to reduce speed and/or traffic volume where appropriate. The *variable speed zones* currently in operation at some Hamilton schools are a key mechanism by which traffic can be calmed. The notion of traffic calming is epitomised however, by the design of the Dutch ‘Woonerf’ or ‘street for living’ from the Netherlands, which promotes the coexistence of pedestrians, cyclists and motor cars. The success of pedestrian safety interventions such as this is reflected in low child pedestrian injury rates in the Netherlands, despite the country’s high population density and high participation rates in active transport (Carver et al. 2008). Furthermore, similar efforts are being made in the U.K, where the English Department for Education and Skill (2003) now recommends that “local authorities should consider what measures might be appropriate to make the area around a school a safe place for children to enter and leave” (p. 18).

### *Infrastructure*

The way streets, roads and routes to major attractions are designed has the ability to significantly impact on the popularity of active transport in a city. Improving Hamilton’s active transport rates therefore requires altering the city’s current motorised transport-focused system to meet cyclist and pedestrian needs. Countries with high incomes, such as America, the United Kingdom, Australia and New Zealand have some general risk factors in common for pedestrians and cyclists, such as poor street visibility, high speeds,<sup>7</sup> lack of cycle space, lack of caution taken by both the driver and the cyclist, and poor provision at crossings and intersections<sup>8</sup> (Peden et. al, 2004). Nations with improved infrastructure, such as the Netherlands, have noticed a major increase in active commuting by adults and children, accompanied by a minimal accident rate. This suggests that with the right infrastructure active commuting can become both safer and more popular.

I have found through my own cycling experiences that Hamilton’s physical environment is not very supportive of cyclists. Many of Hamilton’s roads are unsuitable for adult cyclists to share with motorists, and would be even less suitable for less experienced and less visible cyclists, such as children. If Hamilton’s streets were further developed so that cyclists are not physically threatened, there may be more participation in active transport. Currently, Hamilton – like many parts of New Zealand – is devoting additional funding towards improving facilities for active transport.

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<sup>7</sup> At speeds of less than 30 km/h, pedestrians and cyclists can mix with motor vehicles in relative safety. At low speeds, drivers have more time to react to unexpected events and to avoid collisions.),

<sup>8</sup> In urban areas, most fatal or serious cyclist crashes occur at intersections

### *Distance*

The distance between school and home is a barrier to active transport, though this is sometimes be due to misperceptions about the length of distances to destinations, resulting in private motor vehicles being the preferred choice of transport. The Ministry of Health (2007a) found that 67.5% of parents or care-givers reported that they live too far away from school for their children to participate in active transport (p.44). Moreover McMillian's (2006) research found that "when caregivers report the distance from home to school as being less than one mile, the probability of walking or bicycling increased" (p.7). Similarly, Yeung, et al. (2005) found that "commuting distance was associated with increased odds of active transport in children" (p.899). Hamilton's typically low density housing zones result in sprawling suburbs, meaning that the distance from home to school will be longer than in high density housing zones. Despite having a zoned school system (where children are generally required to attend the nearest school), the (perceptions of the) distances involved are such that they still present a barrier to active transport for many children and subsequently a chauffeuring culture is further encouraged.

### *Safe routes*

Road design and traffic control are critical when establishing child-friendly routes to school. Routes that have lower speed limits, low traffic volumes and are simple for children to understand (for example roundabouts can be difficult to understand) can make children's active transport to and from school much safer and simpler and therefore more likely. Countries with roading policies that support safe routes to school have achieved much lower child pedestrian accident and death rates. Furthermore, safe routes can encourage further engagement with active transport and Timperio et al (2006) point out that "given the negative association between active commuting and the need to cross busy roads, parents may feel more comfortable if other children used the same route" (p. 49). That is, some children might be prepared to take a less direct route to school, if it is an established safe route used by other children. At present there are a small number of safe routes to and from local Hamilton schools, and most are not the most direct routes; this need not inhibit active transport significantly, however. A more pressing barrier in the course of this research was the difficulty I had in discovering where the safe routes are!

### *Attitudes*

Many cycling organisations such as *Cycle Action*<sup>9</sup> highlight the negative attitudes that motorists have towards cyclists, citing it as one of the biggest challenges cyclists are faced with in New Zealand. Cyclists legally have the same rights as motorists on the road (Land Transport, 2006b) but for many cyclists this is not a reality. Closely related to this, the Ministry of Transport (2009) found that 63% of crashes involving

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<sup>9</sup> "Cycle Action is actively involved in lobbying and consulting with local and regional councils and other government agencies (e.g. Ministry of Transport, New Zealand Transport Authority) for an improved cycling environment in Auckland" (Cycle Action, 2009).

cyclists were not the fault of the cyclist (p.6). Accidents which occurred during the period over which this research was undertaken support these data. For example, local media reported that a German tourist was killed by a truck on a New Zealand rural road and a group of cyclists was struck at an intersection in Auckland city, resulting in serious injuries for some riders. In both instances the police found no fault with the cyclists and the drivers were charged.

In the public arena, the accidents fuelled what has been an ongoing debate between motorists and cyclists in regard to the respective rights and duties of the parties. For example, Mike Fouhy, a recreational cyclist from Stoke, commented in the Nelson Mail that “road rage directed towards cyclists is getting worse” (2009). Along with Mike Fouhy, many cyclists have commented on drivers’ attitudes towards sharing the road with cyclists and have indicated that in order for cycling to become safer, motorists need to become aware of cyclists and their needs as equal road users. I had personal experience of this type of problem when cycling to Aberdeen primary school. I was travelling along a major route, Ellicott Road, close to Fraser High School. A motorist passed me, then stopped abruptly directly in front of me, parking on the yellow (no-stopping) lines to drop her son off at school. This pushed me out onto the middle of a busy main road, desperately hoping that other drivers were alert – and tolerant.

The attitudes of pedestrians can also create a barrier, preventing children actively travelling to school. O’ Fallon, (2007) identified a problem with high school students and *share with care* policies. Often High school students will walk to school in large groups, dominating the entire width of a foot path, which can be very intimidating for younger children to cycle through. While it has been argued that as cyclists become more common on the roads, drivers should become more aware and courteous to cyclists, it is clear that it is not only motorists who need to become more courteous on the roads. As is often the case, the behaviour of the few colours perceptions of the many and many drivers express frustration with all cyclists due to some cyclists’ inconsiderate actions and so the cycle of frustration is repeated.

## **Personal Issues**

Other than the public barriers discussed above there are some personal factors which contribute to parents’ and children’s choice of transport mode. McMillian, (2006) points out that while infrastructure is important, is not the only factor that influences a caregiver’s decision about a child’s trip to school. Other significant considerations include the abilities of their own child/children, their unique family context<sup>10</sup> and “competing demands on their time and finances” (Pont et al. 2009, p, 858). These personal factors which contribute to a parent’s decision about active transport to school also need consideration, but perhaps the barrier that looms largest in many parents’ minds is that posed by other adults.

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<sup>10</sup> Marital status, ethnicity, availability of cars, or socio-economic status, for example

### *Stranger danger*

“In recent years there has been an increase in the publicity and occurrence of abductions, assaults and violations of primary school aged children” (Gray, 2005, p.6). This kind of danger is often referred to as stranger danger. “Stranger danger relates to parents’ fear that someone, a stranger may bully, molest or snatch their child” (McMillan, 2006, p.157). Parents and children are educated on stranger danger and Beaulieu (2008) notes that “parental concern about stranger danger is associated with decreases in the proportion of children who walk to school” (p. 26). This has a cumulative effect in that as the numbers reduce, the safety associated with high numbers is diminished. Thus as fewer children actively commute, the likelihood of more children actively commuting is further reduced. While we acknowledge these concerns, the perceptions of stranger danger tend to exceed the level of actual risk and the likelihood of abduction in New Zealand is relatively low. None-the-less messages from the media reinforce the perceived risk of stranger danger which then perpetuates a negative cycle of chauffeuring. This itself is counter-productive because as more children are being chauffeured to school, the number of children and parents on the streets reduces, making the chances of abduction more likely because there are fewer witnesses and people to watch out for or protect the child.

### *Time/Convenience*

Research shows that parents’ convenience influences a child’s opportunity to participate in active transport. Not surprisingly, McMillian (2006) found that the “caregivers who reported driving being more convenient, or to fit in with their own schedule better, had children that were less likely to walk or bicycle to school” (75). The demands of full time work and the corresponding fast-paced lifestyles, along with a mother’s work status “can also strongly influence whether children walk to school” (McDonald, 2008, p.327). Data from the United Kingdom show that convenience was a primary reason for dropping children at school (McDonald, 2008), and in New Zealand the pattern is repeated. The Ministry of Health (2007a) identified “time” (p. 44) as a significant reason for children not actively commute to school (MOH, 2007a), in part because children participating in active transport may also create extra planning for the parent. For example, in the Waikato the weather is considered to be unpredictable and therefore if a child is cycling or walking, parents need to make sure their child has remembered his/her raincoat, umbrella and even a change of clothes. The extra work and organising can reduce the desirability of active transport, as can the regular bike maintenance required for safe, reliable cycling. Again we note the contradiction evident in Kingham and Ussher’s (2007) survey.

### *Children’s abilities*

Every child develops at different ages and stages of growth and it can sometimes be difficult for a parent to be sure that their child has fully developed the skills needed to safely negotiate the dangers associated with cycling on the road, particularly at peak traffic times. Children face some additional challenges when cycling, including “hearing problems which affect detection of traffic, understanding the meaning of

signs and signals, judging speed and anticipating manoeuvres” (Tolley, 1990, p. 255). There are also those physical elements that make active transport more dangerous for children, such as their tendency to be easily distracted, their short stature and their inability to judge safe distances easily. The New Zealand Police (2006) also warn against assuming that your child can make good decisions when things present themselves unexpectedly, because children lack the experience that adults have in manoeuvring through traffic and understanding other road users’ often unpredictable behaviours.

Whitebread and Neilson, (2000) found parents rated their child’s age as the most important factor in their decision to allow their child to walk to school. Many of the resources available to parents regarding active transport recommend that children should not cycle on their own until they are at least ten years old. This is because many studies evaluating the developmental skills of children indicate that 5 to 6 year olds do not have sufficient skills to consistently cope with traffic (Whitebread & Neilson, 2000). However, a ten year old child who has been chauffeured by car to school their entire life may also lack some of the essential road safety skills. This is because “chauffeuring children to destinations limits their opportunities to learn how to walk or cycle safely in traffic” (Timperio et al. 2004, p. 46). Thus a parent may find it difficult to believe that their child is ready or has sufficient skills to navigate to school safely, or conversely and more dangerously, may assume that skills exist simply because their child is “old enough”.

#### *Socio-economic status*

Like most areas of life, travel behaviour is influenced by socio-economic and demographic issues. For example “if you’re a child with lower socio-economic status you are more likely to walk or cycle to school, and cross roads with higher traffic volumes and speeds than better off kids” (Kypri & Wright, 2000, p. 6). Hence belonging to a lower socio economic group increases the likelihood of an accident by virtue of the higher risk faced on the journey to school. Thus some child pedestrian injuries could be viewed as a direct result of the unequal distribution of wealth. Furthermore, this situation is heightened through the inequality that exists in access to prevention strategies. This can be seen in Auckland’s *walking school bus* programme “where half of Auckland’s walking school buses are operated by schools serving the highest 10% of socio-economic communities” (Newbury et al. 2008, p.3). Such inequalities suggest that more effort should to be invested into infrastructure and safety strategies for schools in the poorer areas of cities.

A further factor which can influence a child cycling to and from school is the high cost associated with bicycles and safety equipment. Many parents from lower income groups may not be able to afford this equipment, and theft can compound the expenses. Parents may therefore not allow the bikes to be taken to school, further minimising a child’s opportunity to participate in active transport.

#### *Fashion*

Active transport requires a reasonable amount of planning, partly because specific safety equipment and appropriate clothing are required. For example, a helmet,

supportive and covered-in footwear, a well-fitted backpack and high visibility clothing are all needed for safe active commuting. Some of these requirements however, can prevent or discourage some children from participating in active transport – particularly fashion-minded children. This is because some children may not have (or want to wear) appropriate footwear or they may not want to get “helmet hair” or may face teasing about their high visibility clothing. I found choosing the right outfits to cycle in a real challenge. I could not wear my flared yoga pants because they could get caught in the chain; I had a lot of trouble finding bright coloured clothing to ensure high visibility and the bright coloured clothes I did have were dresses! I even found the satchel bag that I own to be inappropriate for cycling without a carrier. The factors influencing transport decisions are clearly far more extensive than anticipated and fashion and practicality could prove to be significant barriers for some children. Moreover, many cycle shops are finding that children are resistant to key safety features, such as the reflectors that are legally required on bicycles. Many shop assistants reported seeing children taking them off before the bike even leaves the shop.

Finally, finding high visibility clothing in children sizes is a real challenge. Many children end up settling for adult sizes, which can create more safety issues for the child when cycling because the shoulder may fall down, distracting the child. Cycle store attendants reiterated children’s aversion to “uncool” equipment in regard to high visibility clothing, indicating a need to devise ways of improving the acceptability of key safety equipment.

## Chapter 4: Discussion and recommendations

### Discussion

There is a vast array of personal benefits associated with active transport for children, such as regular exercise, the opportunity to connect with members of their neighbourhood, increased opportunity to develop social and road skills and establish useful life long habits. Similarly, the public benefits which accrue from increased participation are many – community connectedness, the opportunity to encourage a positive culture change, a healthier population, minimised burning of fossil fuels and reduced congestion on the roads. Active transport therefore, is clearly worth encouraging and the strategies already in place in Hamilton and around the world, speak to an increasing appreciation of the need to enhance the safety of children (and adults) who engage in active transport. There is significant evidence that suggests the countries renowned for their policies of providing safe residential areas for children to play and safe routes to school have much lower child pedestrian death rates and higher participation in active transport. Thus addressing the physical environment in which children actively commute will ensure safer active transport.

In spite of the initiatives already in place in Hamilton, my own experiences of cycling to and from school reveals an unsafe environment. Hamilton's roads are still very unsafe and somewhat confusing, and would be even more so for a child who is likely to have even less experience and knowledge than I do. Children therefore require a much safer physical environment if they are to commute safely. There is a certain irony in the fact that this research has found children will not be permitted to actively commute until the roads are safer, while at the same time improved safety would be a direct result of increased participation (e.g. from reduced traffic congestion and pollution and lower risk of accidents). Tolley (2003) argues that "proper planning for cycling and walking is a catalyst for road safety" (p. 172) and it is sensible to proceed from this standpoint in regard to roading and infrastructure. Hamilton has made some steps towards improving the physical environment and includes further improvements in it future planning.

Education and the promotion of active transport is a vital part of overcoming some of the personal barriers of safe active transport. Convenience is a major consideration when parents decide how their children will travel to school and active transport is not regarded as a convenient option. Safety concerns – both road safety and personal safety – also feature strongly in parents' decisions. Furthermore many writers have suggested that the decision to privately chauffeur their children demonstrates parents' underlying (negative) valuation of active transport. There is increasing evidence that school transport decisions are subject to a number of misconceptions however, the most notable being around convenience and safety. Therefore if parents were educated on the benefits of active transport for themselves, their children and their environment their decision to chauffeur may be influenced. Ultimately, this requires a culture change away from the prevailing car culture.



One of the most progressive benefits of safe active transport is that it can encourage a positive culture change in as much as it can influence individuals' decisions in the future. Active transport to school is a positive way to encourage and reinforce environmentally sustainable and healthy transportation decisions for the future. Once active transport (and therefore physical activity) is a regular occurrence for a young person, perceptions of actively commuting in adulthood may be revised. Hence, active commuting to and from school could significantly increase active behaviour in the future and therefore reduce the negative effects associated with inactive lifestyles in adulthood. This is supported by research that suggests "exercise patterns need to be established in childhood so that people maintain these habits as adults" (Tolley, 2003, p. 132).

#### *Safe routes and infrastructure*

In Hamilton, finding the safest, yet most direct route can be a challenge. While Hamilton does have a cycle network, it appears to not consider school children's needs. A possible solution to this is to work with individual schools and identify children and parents' preferred routes to school, altering the environment to meet their needs wherever possible. This may involve reducing speed limits on some of the most frequently used roads (rather than just the roads directly in front of the school gates), introducing *share with care* pathways, adding yellow lines to prevent motorists from parking on the sides of key routes or even widening roads to add in cycle lanes in order to give cyclists the recommended 1.5 metre space.

#### *Traffic congestion*

Traffic congestion around schools can create an environment where accidents are more likely to occur. Distance (or the perception of it) is an identified barrier that prevents children from participating in active transport. A simple solution to overcome both these barriers simultaneously would be to encourage a mixture of chauffeuring and active transport. This would minimise congestion outside the school, greatly reducing the accident risk and provide regular exercise for the children. The active component of the journey could be gradually extended as knowledge skills and physical development allow.

#### *Resources*

The resources available to parents in regard to safe active transport are varied and scattered, with access often dependent on the parents' own resources. For example, there is a variety of cycling information on the internet but the costs associated with computers and internet use can be too high for some households. I therefore surveyed other avenues of resources for parents and children. The public library had a few cycling focused resources, but none was directly related to children and active transport and unfortunately other avenues that were explored offered very little child specific information for parents.

This report identified several useful resources for parents in regards to safe active transport. This is encouraging, though ready access to it may be a problem for some parents. It makes sense for parents' information to be incorporated into a child's

safety education at school. This may be as simple as lending some of the most useful books out to children during Bike Wise week, or regularly highlighting the Safekids resource base in school newsletters to ensure parents are aware of these resources. Initiatives could go as far as inviting parents to take part in the child's bike training at school. It could also include offering parents training that highlights why it is important for children to participate in active transport and the part parents can play to make it safer for their children to actively commute.

#### *Education - children*

One obvious and relatively immediate avenue to a safer active transport environment is to educate children, parents and motorists. There are many aspects of road safety and active transport that children need to learn as they get older and a number of good programmes are provided in our schools. In conjunction with police, schools teach children the basic road rules and skills needed to safely negotiate around roads. As has been proven in research on helmet use, one of the best ways to influence a child's behaviour is to lead through example. Parents who regularly use a cycle helmet are more likely to have children who wear their helmet regularly as well. This is because "children are deeply embedded in their family contexts, and so behaviours, such as active transport, are influenced by their parents' attitudes, values and beliefs." (Pont et al. 2009, p. 858). Thus education on pedestrian or cycle safety is going to be most effective if it is reinforced in many areas of a child's life, such as at home, at school and on the way to and from school. Finally, as touched on throughout this report, if children are actively commuting as children, when they become motorists they may be more aware of the needs of cyclists and therefore make it safer for cyclists in the long term.

Whatever strategies are put into place, the "initiatives need to create a balance between promoting the benefits of cycling for children and meeting their safety needs" (Ministry of Transport, 2003, p. 5). Similarly, "it is also important to achieve a balance between promoting the needs of child cyclists, and meeting those of other road users" (Ministry of Transport, 2003, p. 5). If a significant amount of effort is invested into the needs of the cyclists and other road users such as motorists are disrupted from their general use, there is a possibility that they may become further irritated and less courteous to cyclists. This may then increase the risks of cycling and put our children in further danger. Therefore it is important to consider road use and road users in the fullest sense.

#### *Education – adult road users*

Driver education in New Zealand involves very little information on cycling. An enhanced component in the driver's licensing process which incorporates active transport could assist in promoting safer, more considerate driving behaviour by both motorists and cyclists. Similarly, there is currently no obligation for cyclists to undertake any educational activities at all before using the roads. Thus education about the rights and responsibilities of all road users could foster a culture change on both sides, creating a safer and more supportive road environment for cyclists and motorists.

## *Attitudes*

Currently Hamilton's motorists appear to be very unaccommodating to cyclists and unaware of cyclists' needs or rights. Cyclists have the same rights on the roads as motorists (Land and Transport, 2007), though they are physically much more vulnerable. Given that 63% of cyclist-related accidents are not the cyclist's fault, it is reasonable to assume that driver education is in need of enhancement and media reports suggest that (some) drivers' attitudes also need to alter, though it is acknowledged [some] cyclists also display poor road sense and etiquette. Many writers have argued that as the numbers of cyclists on the roads increase drivers' tolerance and awareness of cyclists also increases. Although there is a certain logic to this line of argument, the evidence is inconclusive. Certainly awareness will increase because cyclists will be a more noticeable part of the roading landscape, but this will not necessarily translate into greater tolerance and respect – indeed, quite the reverse regularly features in media reports. Culture is crucial.

The Ministerie van Verkeer en Waterstaat, Netherlands (2009) argues that it is the underlying culture of cycling in the Netherlands which contributes to their safe active transport environment. The Ministerie reports that accepting the cyclist as a normal traffic participant with equal rights in the 1950's and 1960's has been a crucial factor to the cyclists' safety in some of their main cities today. The effects are clear when one examines the participation and accident rates in these cities. Hence the high participation rate of cyclists contributes to the safety of cyclists because more motorists are likely also to be cyclists and therefore more understanding of a cyclist's needs. We might also note that as child cyclists become motorists themselves they are more likely to recognise the needs of cyclists and be more considerate. Moreover, the Ministerie (2009) associated some of the success to the fact that cycling is not considered a second class citizen's activity, but represents a positive environmentally friendly behaviour. None-the-less, most people will not cycle until it is safe. Therefore, along with changes to our infrastructure, educating drivers about the rights of cyclists and pedestrians is a key factor in achieving a safer physical environment for cyclists. Similarly, culture changes through further education about the benefits of active transport and the disadvantages associated with the chauffeuring culture need to occur.

## *Socio-cultural change*

Social norms and trends are aspects of life which we learn and pass on to our friends and family. Children are constantly learning new social and cultural norms and tend to be easily influenced. The Netherlands has a high percentage of the population who are at some stage active commuters, a trend which has been encouraged for many years through government initiatives and policies. Such policies and initiatives can potentially begin a process of social change. This is because active transport to school may become part of a culture as well as alter society's perception of the benefits and importance of being environmentally friendly, just as it is in the Netherlands. Younger generations' perceptions of active transport could become more favourable if given the opportunity to learn all the benefits of active transport, rather than conforming to the prevailing chauffeuring culture. Tolley, (2003) notes

that “those outside the cars are much more concerned about air pollution, road safety, occupation of space, increasing distances, and inhospitality of public spaces, while those in cars do not even perceive these as problems” (Tolley, 2003, p.129). Therefore if more children participate in active transport, issues that are currently not important to the general population may become more popular and further supported in the future.

### **Safety in Numbers**

Many writers have highlighted the notion of what is referred to as the “safety in numbers” trend. This refers to the fact that in cities where there is a high participation rate in cycling, there is also a corresponding low rate of cycle accidents. This trend leads itself to the argument that as cycling rates increase, cycling in general will become safer. The situation is more complex than this however, and the argument is flawed. While the presence of greater numbers of active commuters will serve to alleviate “stranger danger”, (in the sense that more people would be on the streets to discourage abductions and attacks) any connection with the reduction of other risks needs careful consideration. There will, of course, be fewer motorists on the road therefore reducing traffic congestion and its associated risks.

The presence of the cyclists, however, is likely to have been encouraged initially by strategies design to encourage cycling – infrastructure changes and traffic calming, for example. It is therefore not at all clear that greater numbers of cyclists on the road *per se* will necessarily enhance safety, but rather the measures undertaken to encourage cycling also serve to reduce the risk of accidents. Moreover cities with the infrastructure to support cycling have been encouraging cycling and active transport for a number of years, thus motorists have had the opportunity to adjust to the cyclists’ presence on the roads, and develop a culture of equal road rights between the cyclist and the motorist. In the absence of concomitant improvements in infrastructure and education, improved accident statistics are unlikely and subscription to the safety in numbers trend may itself be risky.

While it is acknowledged here that significant alterations in the physical environment are required before active transport to school can be safely encouraged, the prevailing chauffeuring culture in the pursuit of a safer lifestyle can be counter-productive in that it hinders a child’s opportunity to develop mentally, socially and physically. This report recognises the dangers of active transport, but highlights the need to find a balance between reducing accidents and encouraging children’s development through active transport. Existing barriers to, and initiatives aimed at achieving that balance are discussed below.

### **Recommendations**

In 2005, Gray conducted research on Hamilton for H.E.A.R.T (Hamilton’s Alternatives to Roothing Transport) and recommended the introduction of “a comprehensive safe routes to school programme, which could address all modes of travel to school, infrastructural improvements and behaviour change, but with an emphasis on

promoting walking and cycling” (p.9). Gray also suggested the provision of incentives to encourage cycling by students and advocated the development of a cycle route network connecting all parts of the city. Hamilton City Council has taken steps towards make cycling safer and more popular – though not as comprehensively as Gray suggested – and the key initiatives are now outlined and assessed. .

## **Existing initiatives**

### ***Kids on Bikes***

The *Kids on Bikes* scheme addresses many issues associated with inactive lifestyles, child development and barriers associated socio-economic status. It demonstrates and emphasises the importance of sound bicycle riding skills and knowledge of the road rules.

We recommend that the *Kids on Bikes* initiative should be supported and extended to ensure these benefits continue to reach as many children as possible.

### ***40km/h variable speed zones***

These reductions in speed limits reduce the risk of accidents because a lower reaction time is required for a motorist if a child appears in their path and the level of injuries sustained is significantly reduced if a child is hit.

We applaud the initiative, but would like to see it extended to all schools. We also advocate further reducing the speed limit to 30 km per hour.

### ***School Travel Planning***

School travel plans can be an essential way to fully facilitate safe active transport to and from school. To achieve maximum benefits, the school travel plan programmes need to include the Hamilton City Council, schools, the community, students and parents. Re-evaluation of school travel plans should be a routine part of any future infrastructure or transport developments.

We endorse the scheme and recommend that the model used in the United States (SRTS) is investigated further.

### ***Infrastructure***

While Hamilton has taken some steps towards safer active transport, the local environment still presents an ominous array of risks to children using the roads and finding the safest, yet most direct route can be a challenge. Traffic calming measures have a proven ability to provide a safer environment for active commuters. Similarly, changes to Hamilton’s infrastructure have established a means of traversing some parts of the city without the need to negotiate motorised transport. The separation of cyclists and motor vehicles (however slight the separation might be) is inherently safer than shared carriageways.

We recommend continued advances in roading and infrastructure changes such that the emphasis is on reduced reliance on private motor cars and increased participation in active transport.

### ***Time Staggering***

Staggering the start and finish times of schools within a specific geographical area in a simple but effective way of minimising traffic congestion with imposing undue inconvenience on any of the stakeholders, since the time changes are minimal.

We support its continuation and recommend extension where appropriate.

## **Cycling into the future**

Unfortunately, before children can actively commute alterations to both the physical environment and attitudes within the community need to occur. The following sections discuss a range of adjustments and strategies which may be appropriate in Hamilton.

### ***Traffic congestion***

Traffic congestion around schools creates an environment where accidents are more likely to occur. Measures to reduce the number of cars dropping children at school or picking them up at the end of the day, will reduce the risk of accidents significantly.

We recommend simulating the Happy Feet programmes, and driving children part of the way to school, leaving them to actively commute the remainder of the distance.

### ***Safety in numbers***

We do not accept this argument at face value. The safety referred to is not simply a function of the greater numbers of cyclists on the road, but is instead the result of broad-based and well-planned improvements in infrastructure, education and socio-cultural factors.

We recommend that this line of argument be discontinued, since to rely on it is likely to result in higher risks for cyclists.

### ***Fashion***

There was evidence that some aspects of safe active commuting were regarded as “uncool” by school aged children. They need not be and there is ample evidence in the media and retail sectors that it is possible to attach a cool mystique” to anything the marketers have a mind to. It does not take a great deal of imagination to think of ways to “jazz up” safety equipment and make it popular. Attaching the name or endorsement of a current popular personality (human or otherwise) seems the most obvious of strategies. None of the cycle stores in Hamilton stocked high visibility gear in children sizes, and most of them indicated that they would struggle to find a

supplier. It appears therefore that there is a gap not simply in the market, but also in regard to a very important aspect of child cycle safety considerations.

We recommend the development and marketing of themed lines of safety clothing designed especially to appeal to children.

### ***Resources***

Access to resources that this research has identified is problematic for families in Hamilton. We suspect that the problem is not confined to the Waikato region, however.

We recommend that Safekids take the initiative with schools by providing regular reminders (perhaps once a term) of the resources available. This process could be facilitated by the Ministry of Education to ensure complete coverage.

### ***Education***

There is currently no compulsory education for cyclists and only minimal reference to cycling in our drivers' education process. While we do not advocate licensing cyclists, we support any initiatives designed to encourage better educated, more considerate cycling in general.

We recommend that a more comprehensive component on the rights and obligations of active commuters is included in driver's licence testing.

### ***Cycle trains***

The Cycle Train concept can address many of the barriers that prevent children from cycling to school. It provides a safe and supervised environment in which they are able to learn the appropriate skills to be able to eventually safely cycle independently. Current cycle train programmes require participants to undergo road safety training and wear reflective clothing. This ensures children are equipped with the appropriate skills and equipment to actively commute as well as setting a standard of road behaviour for their peers and in the future. Further, because children in a cycle train are grouped together the risk of stranger danger is minimised and visibility is increased. Currently there are no cycle trains running in Hamilton.

We suggest that cycle trains are promoted at primary schools around the country as the preferred mode of transport to school and that particular efforts are made in lower socio-economic areas.

We recommend that cycle trains be trialed at some of the primary schools nearest to the city's most comprehensive cycle networks.

We also recommend the development of a system of certificated progress steps for children who participate in cycle trains.

## **Conclusion**

The literature search revealed that the combined health, community, developmental and environmental benefits of active transport “far exceed the health risks from traffic injuries” (Pucher, Dill, & Handy, 2009, p. 1). However this does not imply that further effort is not required to make active transport safer and more enjoyable. It has been found that active transport becomes far more common when facilitated by good infrastructure and policy.

Much of the New Zealand-based research has indicated that children do want to cycle and/or walk to and from school, thereby substantiating a significant demand. It is the community’s task to create a safe environment to allow children to participate in active transport with minimal risk of accidents. However, despite some of the very informative and motivational research already done (Gray, for example), more research is needed, particularly research that is specific to Hamilton. Special attention needs to be paid to children, teachers and parents’ perspectives in regard to potential safety hazards and personal barriers. This is because despite all the possible efforts to make the physical environment safe for children to actively commute, no culture changes will be made unless the personal barriers and attitudes are addressed.

Accidents involving child cyclists are avoidable and many of the initiatives discussed in this report can reduce the likelihood of such accidents. Furthermore, there are many negative side effects of the current chauffeuring culture, but attempts to change this culture require that alternative modes of transport be made as safe and as convenient as possible. This requires further research and much planning. It is important that the many stakeholders discussed here are all consulted about and involved in future developments and initiatives associated with safe road use.



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