

# OVERCOMING BARRIERS TO CYCLING TO SCHOOL: A KEY TO IMPROVING TRANSPORT SYSTEM PERFORMANCE

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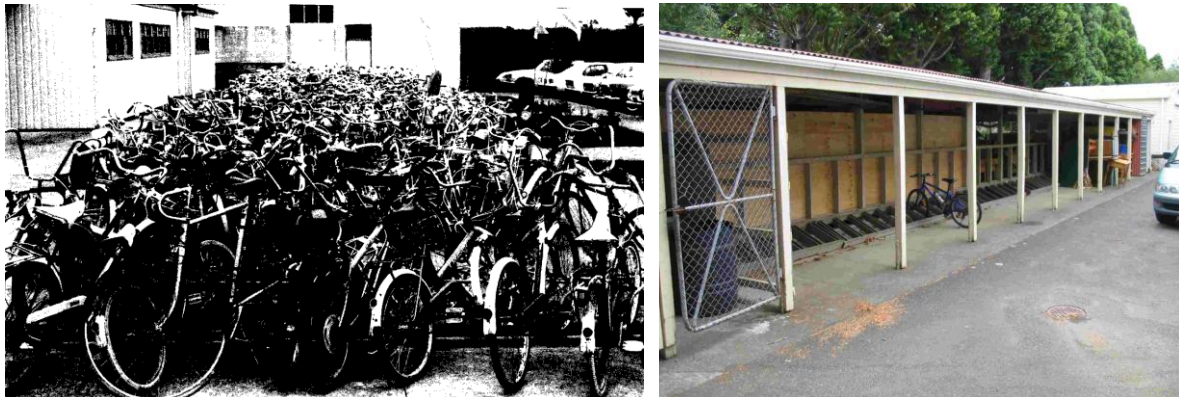
## ABSTRACT

Transport modes walking and cycling, including cycling to school, have been neglected yet they could play a key role in combating obesity, climate change and traffic congestion as well as restoring 'social capital' within communities. The objective of this research was to identify the specific barriers to school students cycling to school for six intermediate schools and recommend interventions that are likely to be effective, acceptable to parents and schools and favourable to school students for each of the schools. These specific barriers and solutions were then used to identify common themes, issues and solutions that might be considered at a national level, and give more confidence to those who are responsible for considering and acting on school cycling initiatives. Four stages of data collection were carried out, including the collection of existing school travel information, site visits, interviews, focus groups and questionnaires. In order to overcome barriers to cycling to school it is proposed that the development of genuinely safe and attractive school cycle networks, cycle training, effective bike storage and the continued implementation of slow zones around schools (or widespread lower speed limits) be implemented or given higher priority.

## INTRODUCTION

Cycling to school in New Zealand used to be common practice. As late as the end of the 1980s it was common to see the bike racks of primary, intermediate and high schools filled with bikes (Figure 1). In Auckland, between 1978 and 1980, approximately 20% of all intermediate school students cycled to school (Auckland Regional Authority 1980) and at some schools the proportion of cyclists was even greater. At Auckland schools Weymouth, Northcote, Papatoetoe, Mount Roskill and Greenmeadow Intermediates, ridership was between 45 and 70% of the school roll. Today, there is still the odd school that has a culture of commuter cycling. Approximately 22% of all students at Belmont Intermediate School on the North Shore of Auckland regularly cycle to school. Broadgreen Intermediate School in Nelson is situated next to a cycle way that has been formed from an old rail corridor and a huge 60-70% of students regularly cycle to school on a good day, and closer to 50% on days of poor weather. Unfortunately, these examples tend to be the exception rather than the norm.

In general, cycling as a travel option for school students has decreased significantly. The average proportion of school students cycling to school in Auckland was 4% in 2008 (ARTA 2008). A recent report by the Ministry of Transport (Ministry of Transport 2008) stated that in 1989/90 those aged 13-17 cycled just over eight kilometres per person per week. Over the period 2003/06 this figure had dropped to approximately 2.5 kilometres per person per week.



**Figure 1. A common sight at school bike racks in the 1980s (left) and 2008 (right).**

Meanwhile, a significant amount of commuter congestion is attributable to educational trips, as evidenced by comparing congestion in urban centres during and outside of school holidays. There is also an epidemic of childhood inactivity and obesity in developed nations and transport emissions account for a large proportion of greenhouse gases.

The decrease in cycling to school is despite a wide range of significant benefits associated with cycling as stated by the Ministry of Transport (Ministry of Transport 2008):

- Improved liveability of communities
- Good for the economy
- Improved safety and personal security
- Improved community accessibility and cohesion
- Part of Climate change solution
- Health benefits.

Accordingly, one of the key challenges outlined in the New Zealand Transport Strategy (New Zealand Government 2008) is to increase the availability and use of public transport, cycling, walking and other shared and active modes. But more recently, in the most recent Government Policy Statement (New Zealand Government 2009), active transport, including cycling, is given less priority. Despite the many benefits of cycling to school, it appears that many still believe that the risk of accident or injury as a result of cycling to school outweigh the benefits or simply that this area of transport is relatively insignificant and is not a priority for action. This seems to be particularly so for primary schools where it is generally considered that children are too young to bike to school. Yet with more attractive cycling facilities, better training and more encouragement, many more primary school students might safely bike to school than currently do so.

A comprehensive survey of 2355 school student's on the North Shore of Auckland (Horspool 2006) is currently New Zealand's most comprehensive examination of the barriers to cycling to school faced by school students. The purpose of the report was to understand how teenagers perceive cycling, including the barriers faced by those considering cycling to school, the health benefits of cycling, environmental benefits, the change in attitude towards cycling in the transition from intermediate to secondary school and safety issues involved with cycling. The key findings of the survey were:

- 75% of Year 8, 9 and 10 students on the North Shore own bikes.
- 9% of Year 8 and 3% of Year 9 and 10 students regularly cycle to school.
- Boys are seven times more likely to cycle to school than girls.
- 33% of Year 8, 16% of Year 9 and 11% of Year 10 students would prefer to cycle to school.
- 40% of students live between 1 and 3 kilometres from the school gate, a suitable distance for cycling to school.
- Safe crossings, safe routes and the need for on road cycle lanes are cited as the most important barriers to cycling to school.
- Secure, covered bike sheds would entice more students to cycle to school.
- More than half of the students indicated that having friends to ride to school with was important.
- More than 60% of those who regularly ride to school ride on the footpath.
- 32% of year 8, 9 and 10 students reported doing less than 3 hours of exercise per week.
- Cycle skills training was also shown to be very important for potential riders.

A key message from this report is that there is significantly more demand for cycling to school than 'supply' of cycling infrastructure and initiatives. Based on these findings, one would expect that if there was good amenity for cycling, then it would be likely that many more students would actually cycle to and from school.

Obesity is an epidemic in the developed world (Ministry of Health 2009) and should be a significant factor when the merits of cycling initiatives are considered. Energy balance (the balance between energy intake and energy expenditure) is at the core of the obesity problem and overseas there is a growing recognition that active transport – including cycling for children, has an important role to play in fighting obesity (Department for Transport 2006, Foresight 2007). Within New Zealand, research has shown that those who use active transport modes to commute to a place of work or study are more likely to be classified as sufficiently active for health benefits and be of normal body mass index (BMI) classification when compared with those who use automobile modes to access their destination (Badland and Schofield 2008). Increasing evidence for the health benefits of active transport (Genter et al. 2008) has led to larger health benefit allocations within active transport economic evaluation processes although the benefits of active transport may still be understated (Genter et al. 2008, SQL Consulting 2008).

The literature suggests that a number of approaches are needed to increase school commuter cycling (Department for Transport 2004, 2006, Horspool et al. 2006, NZTA 2008) but user-friendly environments for cyclists appear to be a priority. Safe routes to school, Neighbourhood Accessibility Plans, lower speed limits, and 'Self-Explaining roads' are all approaches that have relevance. Practical road safety training and effective bike storage are also commonly reported as being important.

However, many are still unsure of the right approach when cycling to school is considered. Therefore, the objective of this research was to identify the specific barriers to school students cycling to school for six intermediate schools and recommend specific interventions for the schools, along with more general, national level recommendations.

## **RESEARCH APPROACH**

Six schools participated in the research - three within Auckland and three outside of Auckland. The Research was carried out in four stages:

- 1) Gathering initial information
- 2) Student focus groups
- 3) Recommendations for action, theoretical maximum number of student cyclists and parents' survey
- 4) Collective themes, consideration of benefits and costs and recommendations

For stage one, school travel survey information, an initial site visit (examining the school environment and surrounding streets and a meeting with a school representative) provided an understanding of the key cycling issues faced by each school. For the next stage, student focus groups gave greater insight into the barriers and solutions for each school. A package of proposed cycling specific interventions for each school was then developed. For each school there was a significant focus on the development of a school cycle network, but secure bike storage, cycle training, bike buddies, a school cycling officer, low speed zones, enforcement around the school and cycle trains were also included as options.

The theoretical number of students who might cycle to each school was then estimated using modal maps and rules for including possible cyclists. A parents' survey, which asked parents a number of questions to determine the importance that they placed on each of eight proposed cycling initiatives was then administered. Parents were also asked to openly comment on initiatives that they felt might be implemented to allow their child to cycle to school safely. The different data collection approaches for students and parents reflected the preferences of these groups. Focus groups worked well for students whereas parents preferred a questionnaire they could complete in their own time.

Finally, the findings from each of the six schools were compared to create overall themes that might have relevance at a national level. Brief and preliminary consideration of the costs and benefits of school cycle networks were also given.

## **RESEARCH FINDINGS**

For all schools except Mount Maunganui Intermediate, the number of students cycling to school was considerably lower than the number who would like to cycle to school or the maximum theoretical number of students who might cycle to each school (Table 2).

**Table 1. Estimated theoretical maximum proportion of students cyclists for each school.**

School	Approx % cycling*	% of Students who would like to bike to school	Theoretical max % cycling A (a)	Theoretical max % cycling B (b)
Avondale Intermediate	1%	16%	20%	55%
Kowhai Intermediate	7%	24%	14%	23%
Wesley Intermediate	2%	13%	31%	58%
			(c)	(d)
Devon Intermediate	14%	35%	29%	58%
Tauranga Intermediate	8%	23%	17%	34%
Mount Maunganui Intermediate	20%	N/A	16%	36%
<b>Average (SD)</b>	<b>8.6%</b> <b>(6.3%)</b>	<b>22.2%</b> <b>(8.3%)</b>	<b>21.5%</b> <b>(8.6%)</b>	<b>44%</b> <b>(15.0%)</b>

- (a) Not including pedestrians, public transport users and those who live greater than 2 km radius from school
- (b) Including pedestrians, public transport users and those who live greater than 2 km radius from school
- (c) Students who live within a 0.75 – 2km radius from school on reasonable cycling routes
- (d) PLUS all students who live greater than 2 km radius from the school on good cycling routes
- (e) Note that methods for obtaining the percentage of cyclists within each school differ. For Auckland Schools this information was obtained from school travel surveys. For other schools the information was obtained from a travel survey which was administered within this project

This supports previous literature and highlights that there is a demand for cycling to school, especially at the intermediate school level. Across all schools, and in support of previous research, the route to school including the amount and speed of traffic and crossing busy roads were seen as the most significant barriers to cycling to school by students and parents. Table 2 shows the parent’s rankings of each proposed initiative. Personal and bike security were also commonly reported barriers. The need for safe routes to school was a very clear priority for students and parents. Training, slower traffic and effective bike storage were consistently identified as priorities and in some cases, stranger danger and access to a bike were also important considerations.

**Table 2. Parent’s ranking of proposed cycling initiatives for each school.**

School \ Proposed Initiative	School cycle network	Cycle skills/ training	Low speed zone	Secure bike storage	School cycling monitor	Bike “buddies”	School gate enforcement	Cycle train
Avondale Intermediate	1	2	3	4	7	5	6	8
Kowhai Intermediate	1	2	3	4	5	6	7	8
Wesley Intermediate	3	1	2	5	4	6	8	7
Devon Intermediate	1	2	4	3	6	5	7	8
Tauranga Intermediate	1	2	4	3	6	5	8	7
Mount Maunganui Intermediate	1	3	2	4	6	7	5	8
<b>Overall weighted rank</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>

The initial school visits, site visits of roads around each school (which involved taking a large number of photos), student focus groups and TLA enquiries contributed to the development of cycling routes to each school.

The NZTA “Fundamentals of planning and design for cycling” guidelines and the Land Transport Safety Authority cycle network and route planning guide (LTSA 2004) were used in the development of concept cycle networks for each school. Along with the information gained from this project some specific requirements for Intermediate school level cyclists became evident:

Intermediate school students:

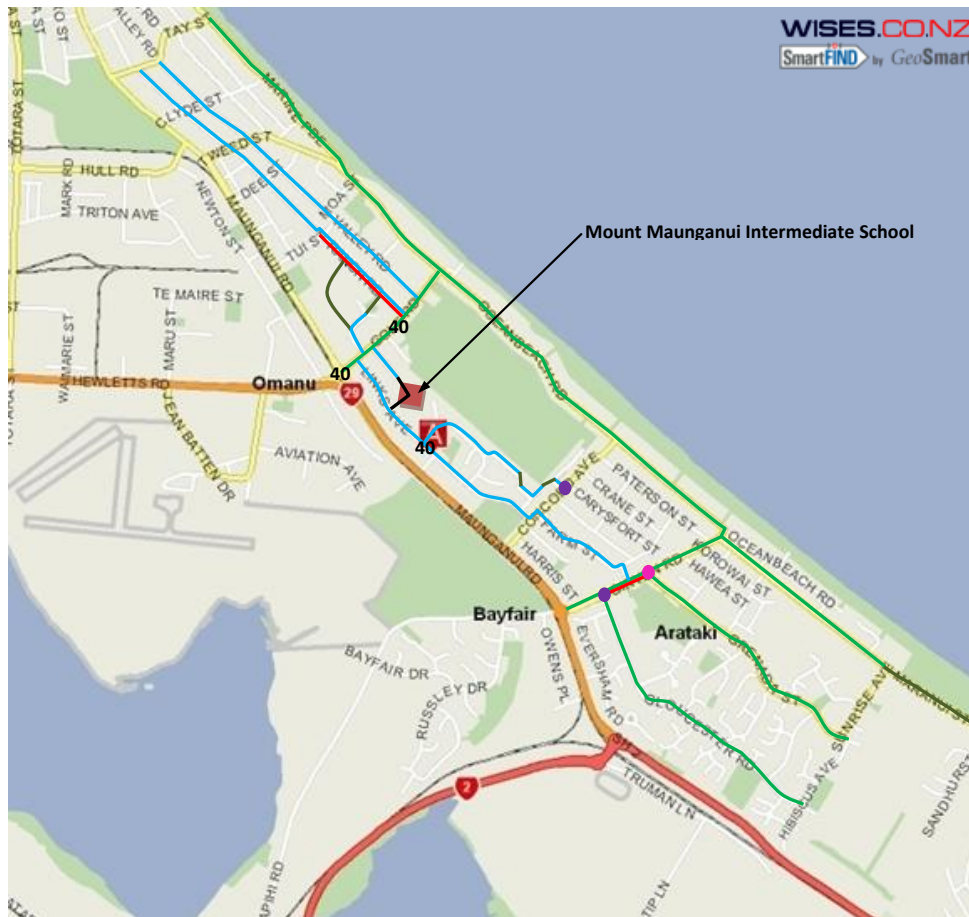
- Are generally not permitted by their parents to cycle on busy arterial roads, although the presence of a bike or bus lane appears to make this acceptable in some instances
- Frequently ride on the footpath along busy roads and in many cases their parents tell them to do so
- Will happily ride on quiet residential streets without specific cycling facilities
- Often use short-cuts, reserves, parks or even carparks to shorten their route and avoid busy roads - although there is sometimes concern about personal security
- Find crossing main roads a real barrier, especially if their route is not well connected to formal crossing points
- Appreciate slower traffic and less of it.
- Place a high value on their bike and somewhere secure to store it
- Think their cycling skills are good (especially boys) – but parents and school representatives place a high value on training
- Will cycle reasonably long distances if the route is good.
- Will cycle surprisingly short distances because they like riding their bike
- Also, many more boys seem to ride school. For girls, riding in pairs or small groups is common.

The proposed cycling network around each school aimed to service the clusters of student residences and already common routes. There was a heavy reliance on the local road network and off-road paths where they existed. In some cases cycle or even bus lanes on busy roads were included in the network as there were students using these facilities already. Where possible, alternative off-road routes or routes on quieter roads were also presented.

Almost all schools have busy arterial roads to negotiate and so 'share with care' footpaths connecting the residential road network to signalised or school crossings on arterial roads were also prescribed. In most cases, it was considered that the majority of engineering expenditure required to make the routes to school safe and attractive would be concentrated on shared footpaths with a good level of service on arterial and other busy roads and upgrades of signalised crossings to make them 'bike friendly'.

The other proposed interventions for each school depended on their 'cycle readiness'. For example, Avondale and Wesley Intermediates are likely to benefit from secure storage facilities and a programme to improve access to a bike, followed by training. More advanced schools where cycling is already part of the culture (such as Mount Maunganui and Kowhai Intermediates), cycle training and possibly a cycling officer might be appropriate options. Figure 2 shows an example of one of the cycle networks that was developed within this project.

One of the most striking differences between schools was that there appeared to be more of a cycling culture at 'non-Auckland' schools, despite the fact that none of these had received any school travel planning assistance. This generalisation requires caution as there are some Auckland schools with significant numbers of commuter cyclists.



- Key:
- Suburban on-road route (no bike lane)
  - Off-road route
  - Share with care footpath
  - On-road bike lane
  - Must walk with bike
  - Controlled or pedestrian crossing at major road
  - Proposed signalised intersection or pedestrian crossing
  - 40 Proposed 40 km/hr school low speed zone

**Figure 2. Proposed cycle network for Mount Maunganui Intermediate School.**

## RECOMMENDATIONS

Previous literature and the present study have demonstrated a number of key points related to cycling to school:

- In recent years, school travel plans have helped to increase the number of children walking to school, mostly through walking school buses. This increase has not occurred for cycling.
- There is strong evidence from New Zealand and overseas that active transport, including cycling to school has an important role for health benefits and in reducing obesity, which is an epidemic in developed countries. There are also many other benefits.



- There is evidence that children who regularly walk as a mode of transport are more likely to do so as adults (and may be more likely to encourage their own children to do so), which may give longer-term benefits to school active transport initiatives than are currently given.
- There is a strong ‘demand’ for cycling to school, especially at intermediate school age. Generally, approximately 20% of students want to cycle to school and are realistic cycling candidates, but this varies between schools.
- The main barrier to cycling to school is the traffic environment and lack of infrastructure provision at busy traffic locations, and related to this, parental concerns about their child’s safety (stranger danger as well as road safety).
- For children cycling to school, parents place a high priority on safe routes to school, cycle training, secure bike storage and slow zones, but there is also support for high visibility clothing. Other initiatives such as cycle monitors or officers, bike buddies and cycle trains may also be useful but are probably less well known or supported among parents.
- Overseas initiatives (including the development of safer routes, education, training and bike storage) to increase the number of students cycling to school have been successful.
- There appear to be different cycling participation rates and perceptions of safety requirements for cycling in different parts of the country. Auckland may be a region that faces larger challenges than other regions, and may need particular attention if a significant increase in cycling to school is desired.

Based on the key points above, the main recommendations for promoting cycling to school at a nationwide level are as follows:

- 1. Genuinely safe and attractive school cycle networks should be implemented or given higher priority.** These should be characterised by the identification and promotion of quiet residential streets, short-cuts, pathways and reserves and the engineering of safe and attractive routes through or across arterial ‘trouble spots’ nearer to the school. Shared pathways and slow speed zones may have significant roles at these locations. Promotional activities should accompany school cycle networks. Such networks may sometimes be feasible within typical school travel plan budgets; although there is a risk that current funding levels do not deliver genuinely attractive or safe environments for cycling to school.
- 2. Cycle training, secure bike storage and more slow speed environments should also be given priority.** It is encouraging that slow zones around schools, and more recently cycle training, are becoming established in New Zealand (including route planning). Cycle training provides skills and habits that can be applied throughout a person’s life. In some countries 30 km/hr speed limits are routinely used where vulnerable road users are expected. There would be considerable safety and travel behaviour benefits by adopting lower speed limits at appropriate locations in New Zealand. In the UK, “BikeIt” (cycling culture development) officers in schools have been very successful and may also be a useful initiative. Cycle trains may also provide a useful step towards independent cycling in some circumstances.
- 3. By more carefully considering the benefits that cycling to school (and active transport in general) delivers, higher priority should be given to school active transport projects and in particular school cycle network projects.** This would

help to ‘future proof’ New Zealand’s transport system, improve social and environmental well-being and improve overall network performance. Countries that have had traditionally low levels of cycling such as the UK, have realised this and are taking active steps to facilitate cycling, including cycling to school. There is increasing evidence that cycling infrastructure is cost effective when the wider benefits are considered, and especially when the infrastructure involves the use of existing road corridors.

## CONCLUSION

In New Zealand, cycling to school could have a role in fighting obesity, reducing transport emissions, alleviating traffic congestion and contributing to more cohesive communities. These benefits would ultimately improve transport system performance and contribute to a more sustainable economy. Unfortunately, the current form of New Zealand’s transport system, and corresponding parental concerns, are major barriers despite recent and commendable efforts by school travel coordinators. In order to overcome barriers to cycling to school, a number of initiatives have been recommended. In addition to giving higher priority to active transport, and in particular, school cycling projects, greater leadership is needed within the wider area of school transport. Only then will New Zealand start to realise the benefits that cycling to school has to offer.

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