School Travel Plan Programme: Regional Analysis Report 2009-2012

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1. Introduction

The School Travel Plan (STP) Programme is a joint-partnership between schools, local councils and Greater Wellington that supports school communities in developing and implementing action plans that improve road safety and promote active and sustainable travel to and from school. The programme has received funding from the New Zealand Transport Agency (NZTA) since 2006.

School age children are over-represented in the region's road safety casualty statistics. In 2009-2012, 10-14 year olds and 15-19 year olds were the second and third most common age groups in cyclist and pedestrian casualties respectively. Road safety data also shows that 15-19 year olds are the most common age group for at fault drivers (also includes motorcyclists) in crashes in the Wellington region.

Schools offer a unique opportunity to reach young people with road safety education. Young pedestrians and cyclists learn behaviours that they will carry with them as young drivers. Under *Safer Journeys* (Ministry of Transport, 2010), young drivers are an area of high concern, and cyclist and pedestrians are an area of medium concern.

This report presents information about the travel to school patterns of children, in the Wellington region, attending schools with travel plans. It looks at how children travel to school, how far children have to travel to school and perceptions of route safety. It should be noted that this information is not representative of the entire region, but as increasing numbers of schools become involved in travel planning the data collected through school travel plans will become a valuable source of travel to school information for the region. The report also includes regional road safety information for children of primary and secondary school age.

Data from the New Zealand Household Travel Survey (NZHTS) show that travel to school makes up around four percent of total trip legs in New Zealand (Ministry of Transport, 2012a). Since the early 1990s there has been a decrease in the proportion of children walking to school, and a corresponding increase in the proportion travelling by car. In particular, the proportion of primary/intermediate age children travelling to school by car increased from 31% to 58% between 1989/90 to 2008-2011. Given this, the aim of the STP programme for primary/intermediate age children is to reduce the proportion travelling to school by car, and increase the proportion using active modes or public transport.

This report also presents results for the regional level evaluation of the STP programme. It only looks at the change in travel to school behaviour (due to survey question changes, road safety perception data is currently not presented) for those schools in the region that have participated in both the baseline and evaluation data collection phases of the travel plan process.

2. Method

2.1 School travel plans

The School Travel Plan (STP) Programme is a joint-partnership between schools, local councils and the Regional Council that supports school communities in developing and implementing action plans that improve road safety, and promote active and sustainable travel to and from school.

A School Travel Plan (STP) is a document, which outlines a series of actions to improve road safety, and encourage and promote active and sustainable travel to and from school. Every school's travel plan is unique. The plan should result in benefits for students, parents and the wider community. It will assist students and parents in identifying safe, healthy and sustainable transport travel practices and help to reduce the number of cars on the road at peak times. In addition it will contribute to the improvement of the environment around the school.

In the Wellington region just over 78,500 children (Ministry of Education, 2012) travel to school every morning (see Table 1). Of these students around 63% are of primary and intermediate age. The national picture for school travel for children aged 5-12 years, shows that around 58% of trips to school are by car (Ministry of Transport, 2012). If it is conservatively assumed that there are two primary/intermediate age students in every car, and we assume 58% of trips to school in the region are by car, in 2011 there would be around 14,300 car trips to school for primary/intermediate age children every morning in the Wellington region.

Table 1. Number of students in the Wellington region by school year level, 2009-2012

	Student numbers as at July			
Year level	**2009**	**2010**	**2011**	**2012**
Year 1 to Year 8 (primary/intermediate age)	49,918	49,682	49,754	49,733
Year 9 to year 15 (secondary age)	29,517	29,390	29,346	28,944
Total	**79,435**	**79,072**	**79,100**	**78,677**

The Wellington Region Land Transport Strategy 2010-2040 sets the following target for the programme:

94, or 41%, of primary and secondary/intermediate schools and 26,761, or 34% of school children exposed to school travel plan activities by June 2013.

As of the end of December 2012, 66 Wellington region schools with a combined roll of 22,807 school children[1] have, or are developing STPs.[2] Figure 1 and Figure 2 show how the programme is tracking towards its 2013 target of schools and students exposed to STPs respectively.

The number of schools enrolled in the STP programme is tracking just below target, whereas the number of students in the region exposed to STP activities is tracking just

[1] Based on July 2012 roll counts from the Ministry of Education school roll returns.
[2] For primary and intermediate schools only these figures become 61 schools with a combined roll of 18,200 children.

above the target for the programme. To keep on target, growth in the number of schools participating in the STP programme will be required over the next year.

Figure 1. The number of schools that have, or are developing travel plans, 2006-2012

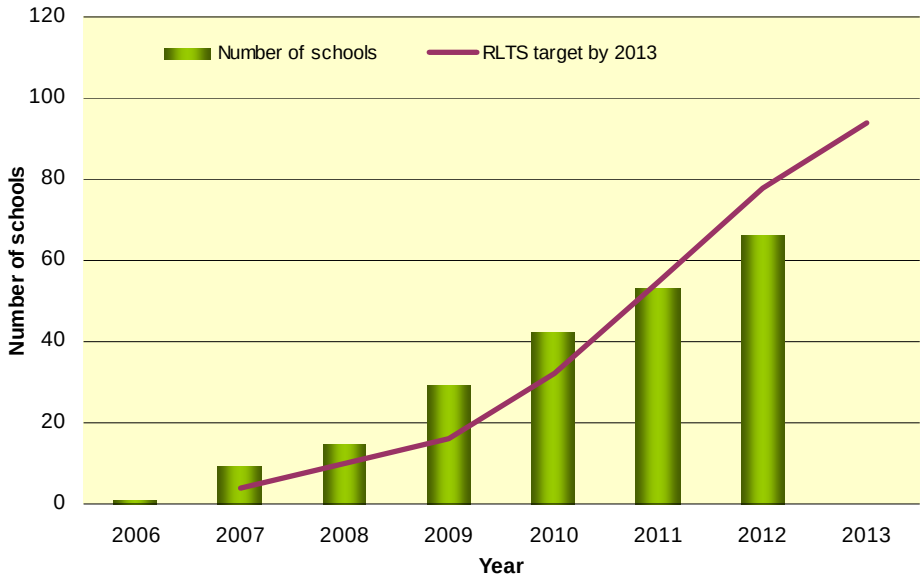
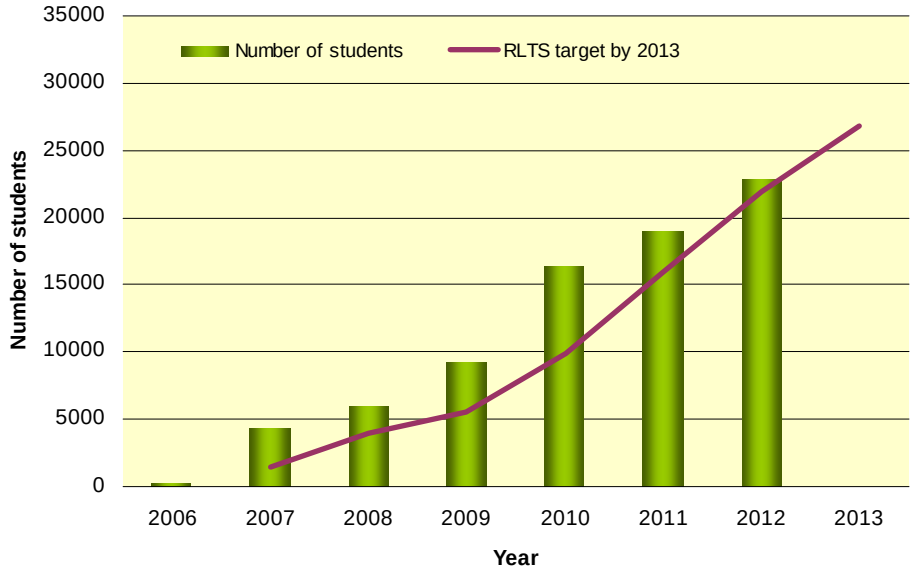


Figure 2. Number of students involved in or exposed to STP activities, 2006-2012



2.2 Data collection phases

Schools involved in the STP programme participate in data collection and monitoring phases. This involves using baseline surveys, conducted at each participating school, that gather information from students and parents around current school travel methods, barriers to using active modes and road safety. Once travel plan activities are implemented, students and parents at the school are re-surveyed typically a year on from implementation. Students participate in on-going surveys to track progress of their travel plan, refine its implementation and provide data on regional trends in travel behaviour (detailed below).

Data from parent surveys has been collated into one dataset. As there have been changes to the survey questions since the start of the STP programme, only the questions that have remained consistent, or can be meaningfully recoded are included in the dataset. There is another dataset for class survey data.

Parent Survey

The parent survey was redesigned for use with the 2011 school year onwards. It is much shorter than previous versions of the parent survey. The survey continues to collect information from parents on how their children travel to school, and what would encourage their children to walk or cycle to school more often. The rest of the survey focuses on safety, looking at perceptions of route safety, and what safety concerns they have about travel to school. Only the safety information collected from parents is used in the analysis in this report.

Class Survey

The class survey records how students travel to school over a one week period and the year level of the student. Home address information is also collected so routes taken from home to school can be mapped to calculate distance travelled, based on mode of travel. Each classroom of students, at each school, was also interviewed to ascertain their perceptions of safety on their route to school and their road safety concerns.

2.3 Calculation of kilometres travelled

The home addresses supplied by survey respondents, and the school addresses are geocoded and used in a customised ArcGIS template to calculate kilometres travelled (KT) based on travel mode.

To calculate KT the main dataset needs to be broken down into smaller datasets for the individual schools, and then each school dataset is broken down further by usual travel to school mode.[3] The template is then used to run each analysis which involves one school point shapefile and one home address shapefile by travel mode. The template calculates KT values based on the shortest route.[4] Once KT values for all respondents with geocoded home address information had been processed these were exported into Excel and then joined to the main dataset.

2.4 Regional travel behaviour-primary/intermediate

Data from both the baseline and evaluation surveys are used to look at the regional travel to school behaviour. Data is pooled together over four years to provide a large enough sample for analysis. This year, data from four overlapping time periods 2006-2009, 2007-2010, 2008-2011 and 2009-2012 is available for comparison. Trends in regional travel to school behaviour can then be examined by looking at data across these overlapping time periods.

[3] The usual modes used for KT calculations are: car (friends car, family car), active (walk, cycle, scoot and skate, walking school bus), PTbus (bus, school bus, private bus), and PTother (train, ferry and other).

[4] Some criticise this as unacceptable and/or inaccurate because people often do not take the shortest or quickest route, however, recent analysis has shown that assuming direct routes is reasonably accurate (NZTA, 2009).

Participating schools

The total number of primary/intermediate schools included in the parent and class datasets that provide a picture of regional travel over the 2006-2009, 2007-2010, 2008-2011 and 2009-2012 periods are shown in Table 2. Also shown is the number of parent and student survey responses received across participating schools. Over the 2009-2012 period responses from 24,446 primary/intermediate age students, across 56 schools, are included in the regional travel behaviour analysis.

Table 2. Number of schools, and parent and student responses used in the Wellington region travel to school behaviour analysis 2006-2009, 2007-2010 and 2008-2011, and the STP programme evaluation

	Regional				STP evaluation	
	06-09	07-10	08-11	09-12	Baseline	Evaluation
Number of schools*	27	36	46	56	26	26
Number of parent responses	-	-	871#	1970#	-	-
Number of student responses	9,303	15,417	19,576	24,446	7,251	8,803

*Not all schools that are enrolled in the STP programme have data included in the class or parent datasets, so totals do not equal the total number of schools enrolled in the programme

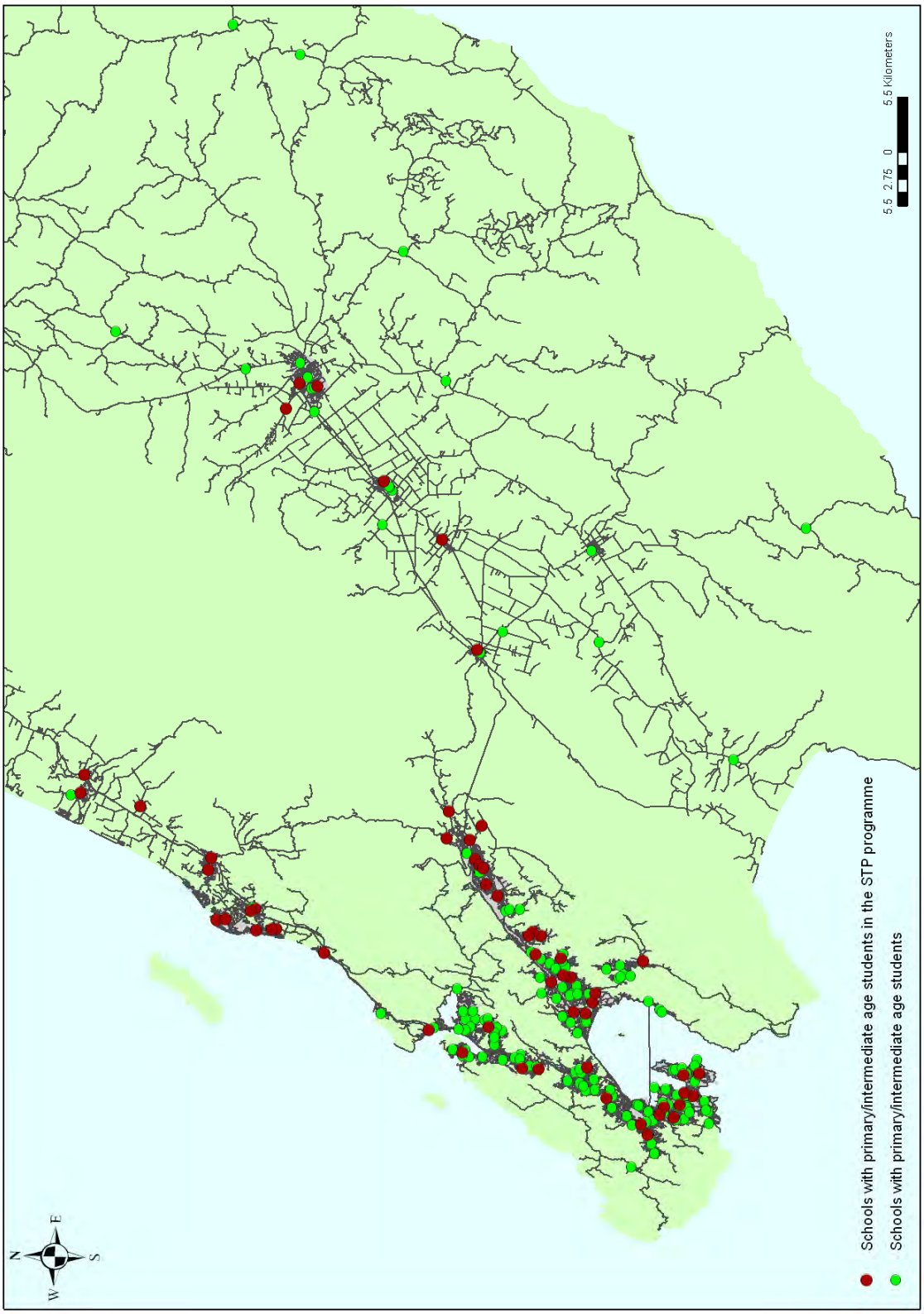
#Only includes data for 2011 onwards, as the redesigned survey questions do not allow comparisons with previous years data

Figure 3 shows all the schools in the region with primary/intermediate age students and which of these schools are currently in the STP programme. Each Territorial Authority (TA) has at least one school in the programme and at least one school included in the 2009-2012 analysis. However, in the 2009-2012 analysis some TAs are over-represented and some are under-represented compared to the regional picture. Table 3 shows the number and percentage of schools with primary/intermediate students across the region and included in the 2009-2012 STP regional analysis. It also shows the percentage of schools within a TA that are included in the STP analysis for 2009-2012.

Table 3. Number and percentage of schools with primary/intermediate age students in the Wellington region, and in the 2009-2012 STP regional analysis by territorial authority

	Region		STP 2009-2012		% of regions schools in STP 09-12
TA	# schools	% schools	# schools	% schools	
Carterton District	6	2.9	1	1.8	16.7
Kapiti Coast District	17	8.2	13	23.2	76.5
Hutt City	47	22.6	13	23.2	27.7
Masterton	14	6.7	3	5.4	21.4
Porirua City	29	13.9	3	5.4	10.3
South Wairarapa District	8	3.8	2	3.6	25.0
Upper Hutt City	16	7.7	8	14.3	50.0
Wellington City	71	34.1	13	23.2	18.6
Total	**208**	**100**	**56**	**100**	**27.1**

Figure 3. Wellington region schools with primary/intermediate age students, all schools and schools in STP programme to date



In particular, primary/intermediate schools in Wellington City (23% in dataset compared to 34% in region) and Porirua City (5% in dataset compared to 14% in region) are under-represented and Kapiti Coast District and Upper Hutt City schools are over-represented (23% and 14% in dataset compared to 8% for both TAs in the region).

This over/under representation is due to the differing rates of participation of TAs and schools in the programme. From Table 3 it can also be seen that 27% of schools with primary/intermediate age children across the region participated in the STP programme across the 2009-2012 period. Across the region the Kapiti Coast District has by far the highest participation rate in the STP, with 77% of its schools with primary/intermediate age students participating across the 2009-2012 period. Upper Hutt City has the second highest participation rate at 50%. Porirua City has the lowest participation rate, with only 10% of its schools with primary/intermediate age students participating in the STP programme.

2.5 STP programme evaluation

Evaluating individual school travel plans is difficult due to the parent and student sample sizes involved. Whilst a number of individual schools have observed shifts in the mode of travel to school of their students it has not been possible to assess whether these are statistically significant changes or due to sampling error.

To overcome this issue and evaluate the STP programme, data from all schools in the region that have completed both their baseline and evaluation surveys have been pooled together. The results of baseline surveys for all schools in this pool are then compared to the results of the evaluation survey for all schools to provide a quantitative measure of the effects of the programme across the region, rather than for individual schools.

To date, 26 schools in the region have been in the programme long enough to have implemented travel plan activities and have conducted both class baseline and evaluation surveys (see Table 2). From the 26 schools participating in parent baseline and evaluation surveys, 7,251 and 8,803 student responses have been received respectively. This gives a regional student response rate of 80.4% and 93.0% for class baseline and evaluation surveys respectively.

2.6 Statistical tests

In this report all the comparisons that have been made were tested for statistical significance at the 95 percent confidence level (alpha level set at 0.05). The alpha level refers to the probability that a difference exists when in actuality it does not.

The confidence interval for a proportion, π, is:

$$p \pm z\sigma_p$$

where p is the proportion in the sample, z depends on the level of confidence desired (z = 1.96 for 95% confidence), and σ_p, the standard error of a proportion, is equal to:

$$\sigma_p = \sqrt{\frac{\pi(1-\pi)}{N}}$$

where π is the proportion in the population and N is the sample size.

To see whether the results of two groups that have been sampled independently of each other (e.g., the mode choice in baseline and evaluation surveys) are statistically significant their confidence intervals are compared. If the confidence intervals overlap the results of the two groups are not statistically significant.

2.7 Crash Analysis System (CAS)

The CAS is an integrated computer system that provides tools to collect, map, query, and report on road crash-related data. It contains data from all traffic crashes reported by police. The information provided by CAS is used to determine and analyse trends, which help direct recommendations around road safety funding allocations, target road safety programmes and monitor their performance.

Data from CAS relating to crashes involving school age pedestrians and cyclists, and injuries to school age pedestrians and cyclists, are presented in this report.

2.8 Regression analysis

When looking at related factors one at a time a number of significant relationships appear, but it is hard to tell how many of these are due to correlations between the survey variables. It is necessary to fit a model which includes all factors in order to see which remain significant when the other factors are also taken into account.

Multiple regression analysis was carried out to do this, and investigate the factors related to active mode use frequency per week. Active mode use frequency was used as the dependent variable, and student year level, distance to school and territorial authority were used as explanatory variables and included in the regression analysis.

The regression was carried out using a 'stepwise' approach in SPSS, whereby explanatory variables are added to the model one at a time, the most significant each time, until no further significant relationships (at the 95% confidence level) with the dependant variable can be found. The regression identifies the explanatory variables that have a significant relationship with the dependent variable, reported by SPSS as the standard (β) coefficient. This can be regarded as equivalent to an 'effect size', controlling for all other variables in the model.

2.9 Important points to keep in mind when reading this report

Data collected through the STP programme around travel to school behaviour and issues, currently involves around a quarter of schools with primary/intermediate age children in the region. Schools involved are not representative of the distribution of schools across the region, however, there is an expectation that as more schools join the programme, this type of analysis will provide a rich source of information about the region's travel to school behaviour.

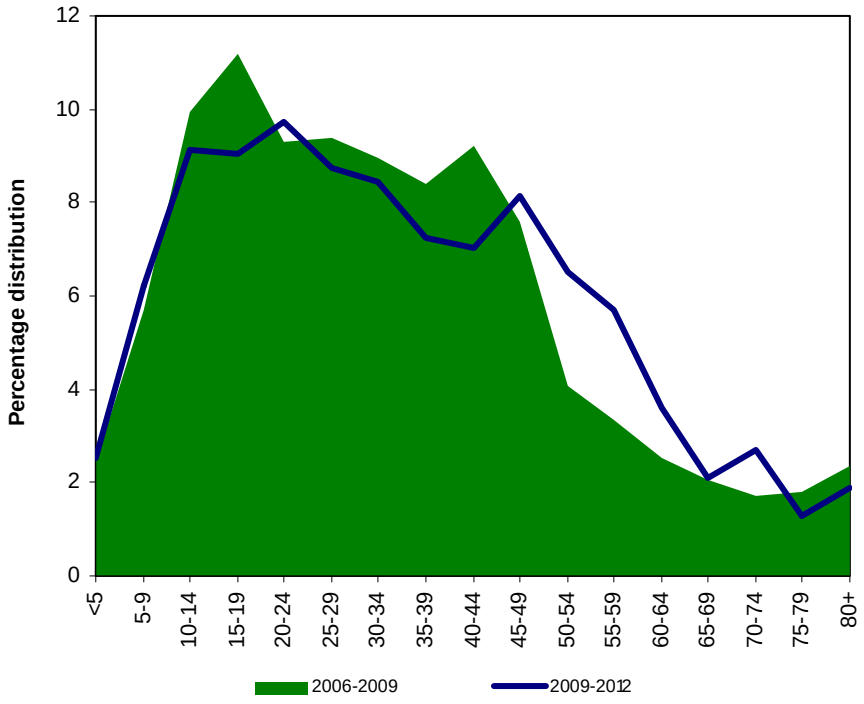
In addition, the evaluation of the STP programme is currently only based on a small number of schools. The number of schools will increase each year making changes in travel behaviour easier to measure and more complex analysis possible. As a travel plan is unique for each school it is not possible to relate travel plan activities to any resulting changes in travel to school behaviour.

The commentary in this report only includes findings/changes that are significant at the 95% confidence level. Whilst other trends may be apparent, these are not significant at this level with the current sample sizes in the datasets.

3. Road Safety of School Age Children

School age children are over represented in the region's road safety casualty statistics. As shown in Figure 4, in 2009-2012, 10-14 year olds and 15-19 year olds were the second and third most common age groups respectively in cyclist and pedestrian casualties. CAS data also shows that 15-19 year olds are the most common age group for at fault drivers (also includes motorcyclists) in crashes in the Wellington region.

Figure 4. Age distribution of pedestrian and cyclist casualties on the road, 2006-2009 and 2009-2012



Increasing the safety for school age pedestrians and cyclists is key to increasing active mode use for travel to school. Currently just under half of all crashes involving school age pedestrians and cyclists occur during the commute to/from school between the hours of 7:30 - 9:00am and 2:45 - 4:15pm. This suggests that improving safety during the commute to/from school period could have a significant impact on road safety statistics.

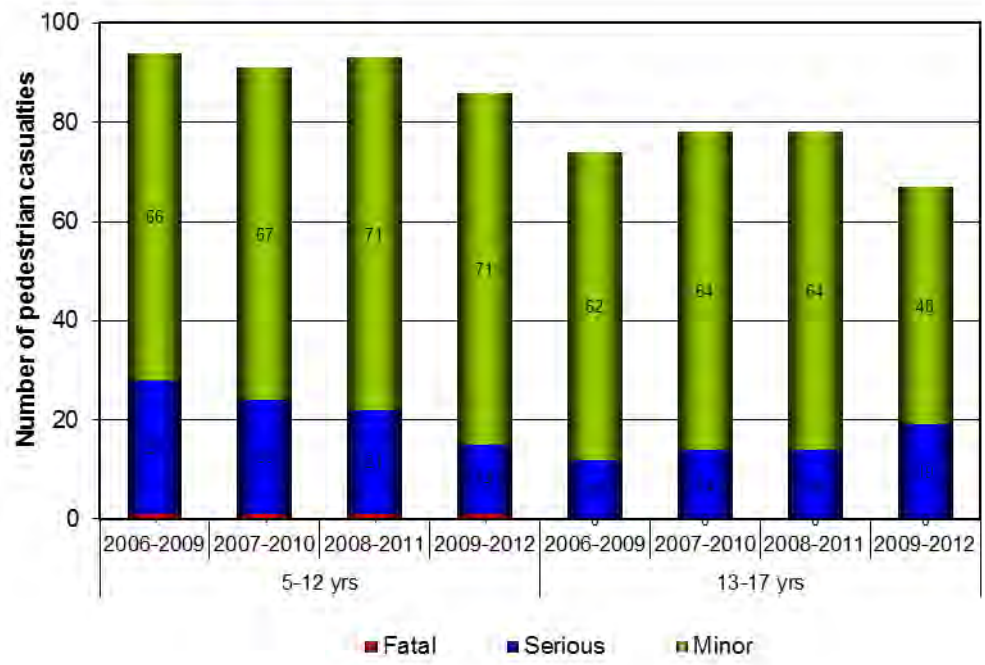
The following sections take a closer look at pedestrian, cyclist and driver casualties as reported in CAS. For this work primary age children are defined as being 5-12 years old, while college age includes all 13-17 year olds. Eighteen year olds were excluded from the college age group for analysis as approximately half of this age group will no longer be in college and, having reached the legal drinking age, their crashes include factors that cannot be generalised to other ages.

3.1 Pedestrian casualties

In the 2009-2012 period there were 153 school age pedestrian casualties in the Wellington region (Figure 5), making up 28% of the region's total number of pedestrian casualties. The location of these casualties across the region is shown in Figure 6 (see maps in Appendix 1 for a more detailed look at the locations by TA). Fifty-six percent

of these casualties (n=86) involved 5-12 year olds and 44% (n=67) involved 13-17 year olds. Of these casualties, one was fatal, 33 were serious and 119 were minor.

Figure 5. Number of school age pedestrian casualties by injury severity, 2006-2009 to 2009-2012



Larger numbers of 5-12 year old pedestrians are injured than 13-17 year old pedestrians. In 2009-2012, 56% school age pedestrian casualties involved 5-12 year olds, although the majority of injuries were minor, there was one fatality and 14 serious injuries. Since the first measurement period, 2006-2009, there has been a 9% decrease in pedestrian casualties involving 5-12 year olds, with serious casualties decreasing by 48% (from 27 in 2006-2009 to 14 in 2009-2012).

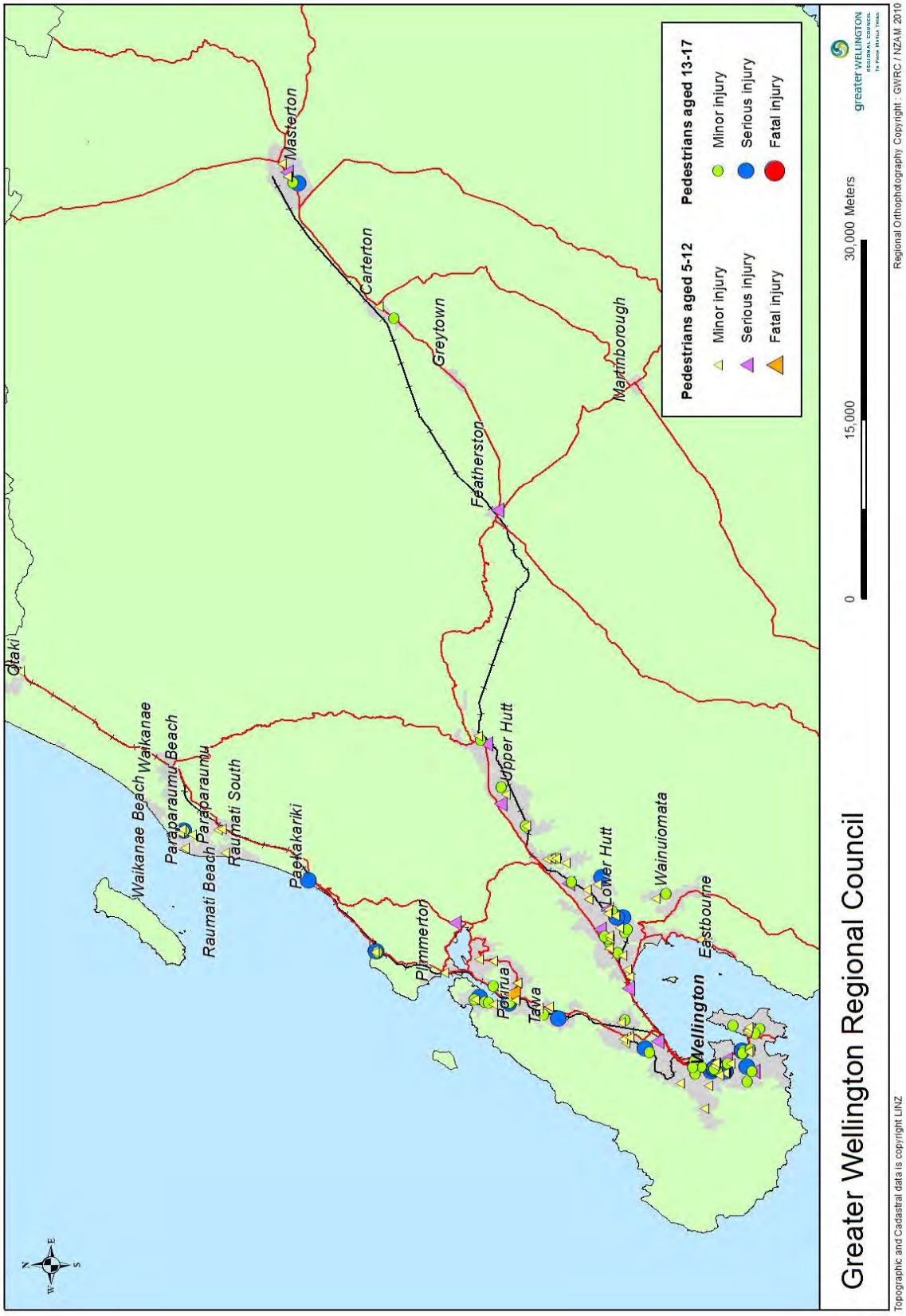
A slightly different trend is observed for 13-17 year old pedestrian casualties. Although there has been an overall decline of 10% in the number of casualties, the number of serious injuries has increased (from 12 in 2006-2009 to 19 in 2009-2012), whereas the number of minor injuries has decreased (from 62 to 48).

The factors contributing to crashes involving 5-12 year old pedestrians and 13-17 year old pedestrians are similar. The most frequently noted pedestrian causes[5] resulting in school age pedestrian casualties are:

- Crossing, running heedless of traffic (26% for age 5-12 and 14% for age 13-17)
- Stepping out from behind a parked vehicle (10% for age 5-12 and 7% for age 13-17)
- Crossing heedless of traffic (3% for age 5-12 and 11% for age 13-17)

[5] Please note that a single crash can have more than one cause attributed to it.

Figure 6. Location of school age pedestrian casualties in the Wellington region by injury severity, 2009-2012



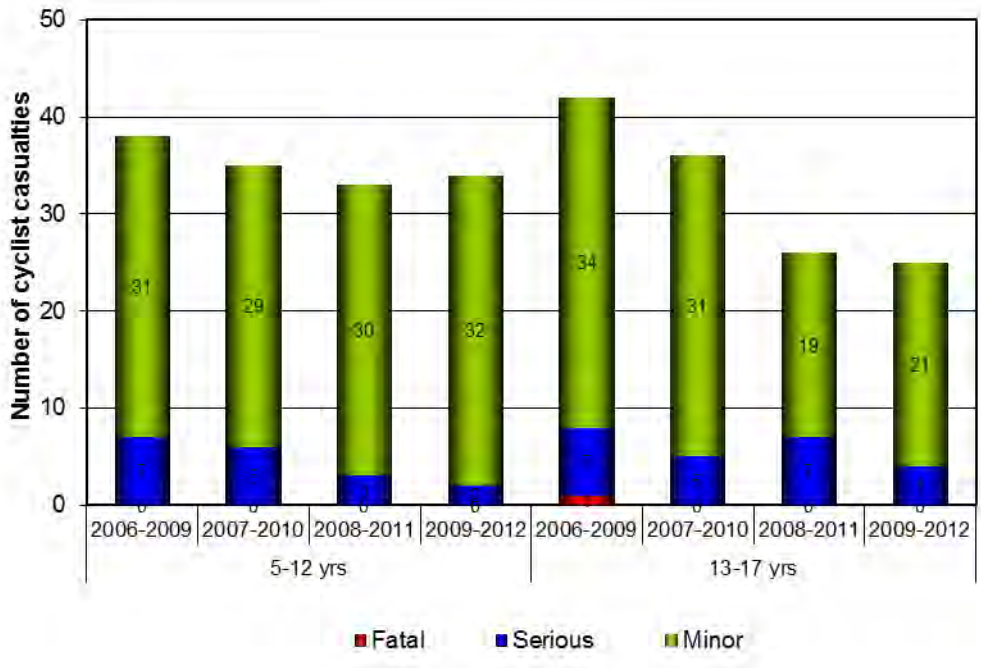
Whereas, the most frequently noted driver causes resulting in school age pedestrian casualties are:

- Failed to give way to a pedestrian at crossing (5% for age 5-12 and 8% for age 13-17)
- Did not see or look for other party until it was too late (5% for age 5-12 and 7% for age 13-17).

3.2 Cyclist casualties

In the 2009-2012 period there were 59 school age cyclist casualties in the Wellington region (Figure 7), making up 13% of the region's total number of cyclist casualties. The location of these casualties across the region is shown in Figure 8 (see maps in Appendix 2 for a more detailed look at the locations by TA). Fifty-eight percent of these casualties (n=34) involved 5-12 year olds and 42% (n=25) involved 13-17 year olds. Of these casualties, there were no fatalities but 10 serious injuries and 49 minor.

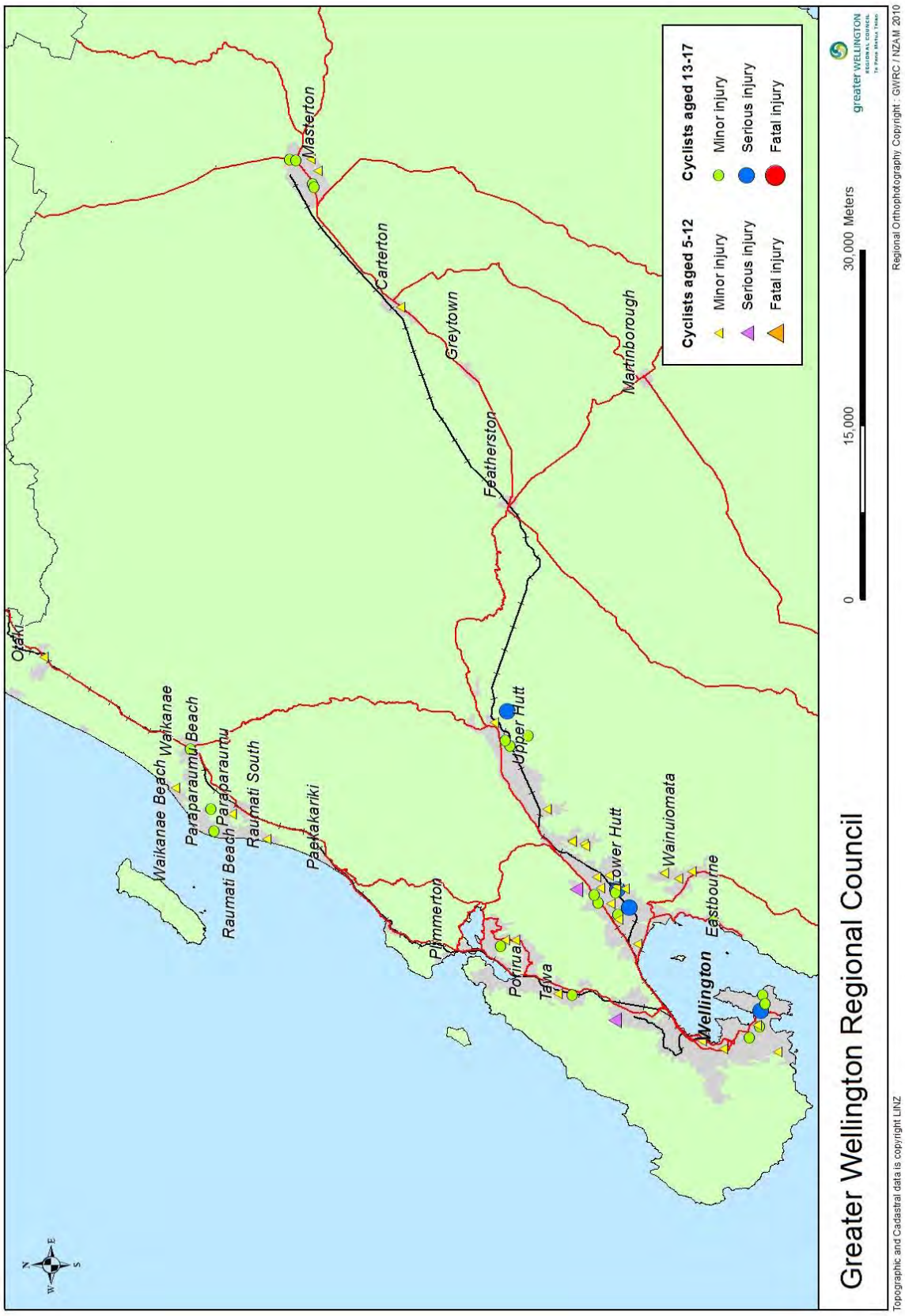
Figure 7. Number of school age cyclist casualties by injury severity, 2006-2009 to 2009-2012



Since 2006-2009 there has been a 26% decrease in school age cyclist casualties, with serious injuries decreasing by 57% (from 14 in 2006-2009 to 6 in 2009-2012) and minor injuries decreasing by 18% (from 65 in 2006-2009 to 53 in 2009-2012).

In 2006-2009, there were more cyclist casualties aged 13-17 than aged 5-12, however this has reversed in recent years. Another notable difference between the two age groups is that there are now fewer serious injuries for children aged 5-12 than aged 13-17. However, there has been no change in the number of minor injuries for 5-12 year olds from 2006-2009 to 2009-2012 whereas they have decreased by 38% for 13-17 year olds over the same time period.

Figure 8. Location of school age cyclist casualties in the Wellington region by injury severity, 2009-2012



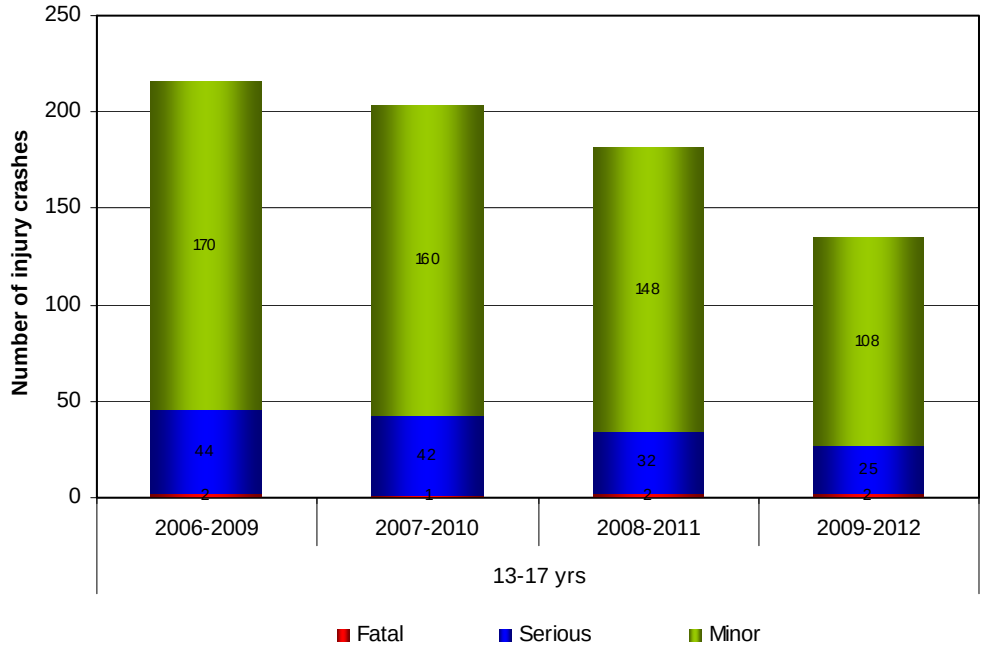
The main factors contributing to school age cyclist casualties are similar, although the frequency of the cause differs between the two age groups. The most frequently noted causes[6] resulting in school age cyclist casualties are:

- Entering or leaving private house/farm (13% for age 5-12 and 3% for age 13-17)
- Didn't see/look when required to give way to traffic from other direction (2% for age 5-12 and 11% for age 13-17)
- Didn't see/look when visibility limited by roadside features (9% for age 5-12 and 2% for age 13-17)
- Failed to give way at a giveway sign (1% for age 5-12 and 8% for age 13-17)
- Failed to give way at driveway (7% for age 5-12 and 3% for age 13-17)
- Riding on footpath (7% for age 5-12 and 5% for age 13-17)

3.3 At fault driver injury crashes

The number of crashes, by crash severity, as a result of a driver (includes car, SUV, truck, moped and motorcycle) being at fault is shown in Figure 9. In the 2009-2012 period there were 135 injury crashes on the region's road that were primarily the fault of a 13-17 year old driver, making up 9% of the region's driver at fault crashes. Of these crashes, two were fatal, 25 resulted in serious injuries and 108 resulted in minor injuries.

Figure 9. Number of at fault driver crashes by crash severity, 2006-2009 to 2009-2012



Since 2006-2009 there has been a steady decline in both serious and minor injury crashes where drivers aged 13-17 years were at fault. Serious injury crashes have

[6] Please note that a single crash can have more than one cause attributed to it.

decreased by 43% (from 44 in 2006-2009 to 25 in 2009-2012) and minor injuries by 36% (from 170 in 2006-2009 to 108 in 2009-2012). Despite this decrease in injury crashes, this age group remains one of the most common age groups for at fault drivers in crashes in the Wellington region.

3.4 Summary

It is widely accepted that CAS under-reports the number of road crashes and casualties, but even with this in mind the data presented in this section provides a valuable picture of road safety trends for school age children.

School age children are over represented in the region's cyclist and pedestrian road casualty statistics. Increasing the safety for school age pedestrians and cyclists is key to increasing active mode use for travel to school. Currently just under half of all crashes involving school age pedestrians and cyclists occur during the commute to/from school in the hours between 7:30-9:00am and 2:45-4:15pm. This suggests that improving safety during the commute to/from school period could have a significant impact on road safety statistics.

In 2009-2012, higher numbers of pedestrian and cyclist casualties were of primary age (aged 5-12) than college age (aged 13-17). In general there has been a decline in the number of school age pedestrian and cyclist casualties from 2006-2009 to 2009-2012, although the increase in aged 13-17 serious pedestrian casualties is of concern.

Running or walking across the road heedless of traffic are the two main factors contributing to school age pedestrian casualties. However, a number of school age pedestrian injuries occurred as a result of a driver failing to give way to a pedestrian on a crossing. These incidents are of concern as a crossing is an area of road that is regarded as a safe place for pedestrians to cross.

The leading cause of primary age (5-12) cyclist casualties is entering or leaving a private house/farm, whereas for college age (13-17) it is not seeing/looking when required to give way to traffic from other direction. Over 2009-2012 there were also a number of school age pedestrian casualties as a result of crashes that resulted due to the cyclist riding on the footpath. Higher numbers of these crashes occurred for children aged 5-12 than 13-17.

College age children are over-represented in at fault driver crashes in the Wellington region. Although it is encouraging to see a steady decline in both serious and minor injury crashes where drivers aged 13-17 years were at fault since 2006-2009, this age group still remains one of the most common age groups for at fault drivers in crashes in the Wellington region. In the 2009-2012 period they made up 9% of the region's at fault driver crashes.

4. Activities of the School Travel Plan Programme

4.1 School travel plan activities by territorial authority

Each school's action plan initiatives are selected by working parties which consider the results of the parent and class surveys in the context of the local environment. The working party members can be parents, school staff, police, road safety coordinators, community members or other organisations. The composition of these groups varies between schools as do the actions that the working parties select (see Table 4). The working party groups are facilitated by the Territorial Authority's school travel plan coordinators.

Table 4. STP Activities and Participants by Territorial Authority

TA	Schools/ Students	Activities
KCDC	18 6,500	• Increasing local capacity to deliver cyclist skills training • Parking changes to improve student safety • Participation in Movin'March by 6 schools • Implemented crossing improvements in 3 locations • Installation of 2 Kea crossings • The installation of two pedestrian crossings one with complimentary traffic calming • The relocation of one school patrolled pedestrian crossing • The introduction of a school patrolled crossing at Ōtaki College • Placing of a pedestrian refuge on the Te Kura-a-iwi o Whakatupuranga Rua Mano pedestrian crossing • Lengthened pedestrian phasing on SH1 at Paraparaumu during school arrival and departure times • Speed radar gun speed surveys, road safety and statistics project at 6 local schools • Working with 4 Student Councils on active travel initiatives

TA	Schools/ Students	Activities
		• Working with 4 student groups at other schools on both active travel and road safety • Cycle winter safety equipment distributed to cycling students – lights and fluoro back pack covers • Pedal Ready cycle skills training • Repainting of all school pedestrian poles at school pedestrian crossings • Inspection of all school pedestrian crossing patrol arms replacing stop discs where necessary • Worked with NZTA to develop footpath linkage to new underpass under SH1 Ōtaki • School patrollers competition and parade down Rimu Road • Scooter racks supplied to all schools requesting them • Upgraded cycle racks installed
PCC	3 1000	• Pedal Ready cycle skills training • Community "Big Bike Fix-up Day"
WCC	22 8000	• Fluorescent yellow backpack covers provided to all children in all participating schools • Road Safety curriculum work with year groups, syndicates and student teams through inquiry learning model • Pedal Ready cycle skills training • Participation in Movin'March • Student forum to present road safety findings to council and stakeholders
UHCC	9 2100	• Participation in Movin'March • Participation in Movin'March • Young Cyclist competition – road safety and bicycle

TA	Schools/ Students	Activities
		control skills
HCC	14 3400	• Safe Drop Off Pou (Posts) decorated by schools and installed in the community at locations from which children can safely walk to their school • 8 new Walking School Buses • Community "Family Fun Night" road safety and active travel focus • Fancy Feet Days (walking to school in decorated shoes) • Crossing safety promotion and driver education • Participation in Movin'March • Pedal Ready cycle skills • Scooter School Safety Skills programme • Road Safety through curriculum work through Math with traffic speeds measured by pupils using radar device • Big Bike Fix-up event at Epuni School • On-going programme of parking enforcement at schools
WRSC	6 1500	• Taking part in Walk & Wheel Wairarapa • Participation in Movin'March • Pedal Ready cycle skills
TOTAL	**70** **22,500**	

4.2 Regional active transport week: Movin'March

Movin'March 2013 was the Wellington region's fourth annual active travel week for schools. This year 39 schools with over 10,000 children registered to participate. This year's Movin'March promotion focused on getting active and being safe on the way to school as a community.

Schools received a resource booklet, with details of competitions, links to other programmes and ideas for celebrating the week. Those who registered on-line, or with the School Travel Plan coordinator or Road Safety Coordinator from their Territorial

Authority, received additional resources to use for their events. Schools were invited to take part in Movin'March in a way that suited their community – being able to choose from a list of activities or create their own Movin'March event.

The resource booklet, which went to all schools, promoted on-line resources for safe and sustainable travel initiatives. The focal event of the Movin'March week was an "All in Day" on the Wednesday, which involved ever student walking or wheeling at least part of their way to school. Twenty-nine schools took part is this even resulting in a total of 7,000 students travelling actively to those schools on that day.

For two schools Movin'March was not timed in a way that work in well with their plan for the term. One school held an Active April instead, and the other created Movin'May.

4.3 Summary

Schools in the region participating in the STP programme use the survey results to plan activities that are appropriate to the local community. Schools from the majority of territorial authorities tend to involve people from outside the school in activity planning to ensure that activities get support from the wider community.

Analysis of mode of travel to school for those students that live within 5km of their school showed significant increases in the proportion of students using active modes to travel to school since the schools became involved in the STP programme.

Initial findings from the schools included in this evaluation are encouraging and show positive shifts towards achieving the programme's aims.

The move away from a dependence on car travel suggests that parents are becoming increasingly aware of other travel to school options.

5. Regional Travel To School Safety & Behaviour

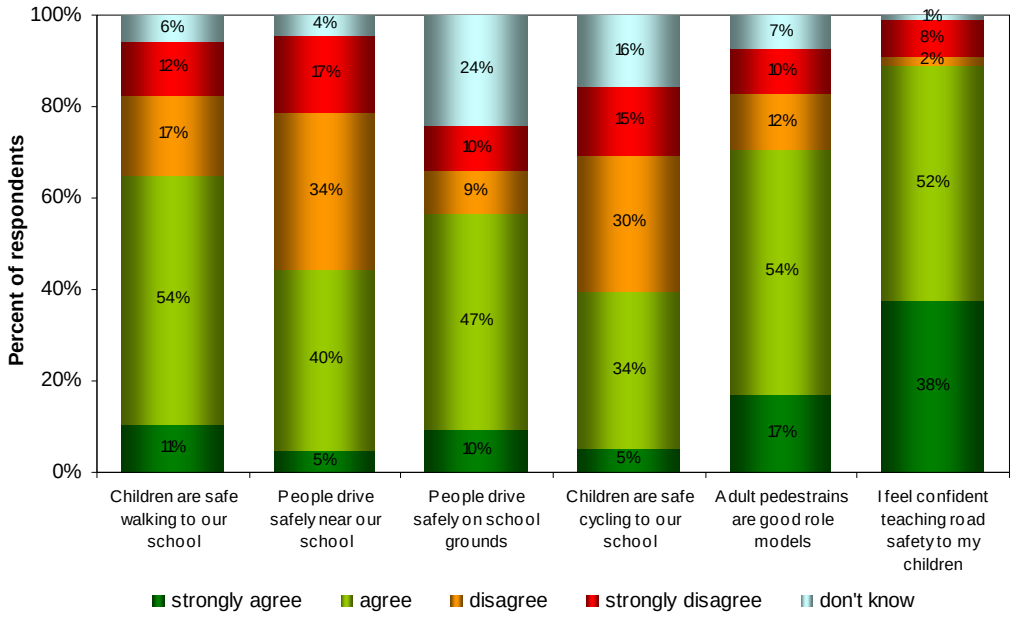
5.1 Safety

The parent STP survey was rewritten for the 2011 school year and now collects perception information across six aspects of safety. As the new safety questions are different from those asked in previous versions, 2011 was the first year of data available for monitoring regional school safety. Data from the 2011 and 2012 parent surveys have been pooled together and are reported here. As more data becomes available on parents' perceptions of safety it will become possible to look at changes in perceptions over time.

Figure 10 shows the extent to which responding parents, at schools surveyed in 2011 and 2012, agree or disagree with six aspects pertaining to safety. The vast majority (90%) of parents feel confident teaching road safety to their children, with 38% saying they *strongly agree* and a further 52% saying they *agree*.

Results show that parents are much more likely to agree that children are safe walking to our school (65% selecting a rating *strongly agree* or *agree*), compared to cycling to our school (39% selecting a rating of *strongly agree* or *agree*). In fact, 45% of responding parents *disagree* or *strongly disagree* that children are safe cycling to school. Parents' perceptions of cycling safety may also be connected to the relatively high proportion of parents disagreeing that people drive safely near their school. The information from 2011 and 2012 shows that around half of responding parents *disagree* (34%) or *strongly disagree* (17%) that people drive safely near their school.

Figure 10. Extent to which parents agree or disagree with six aspects of safety, 2011-2012



Data from the Wellington Regional Transport Perceptions survey, conducted in June 2012, aligns with these findings. In 2012 it was found that 45% of respondents thought children in their local are were safe (selecting a rating of *very safe* or *safe*) if they cycle to school, compared to 76% thinking children are safe if they walk to school.

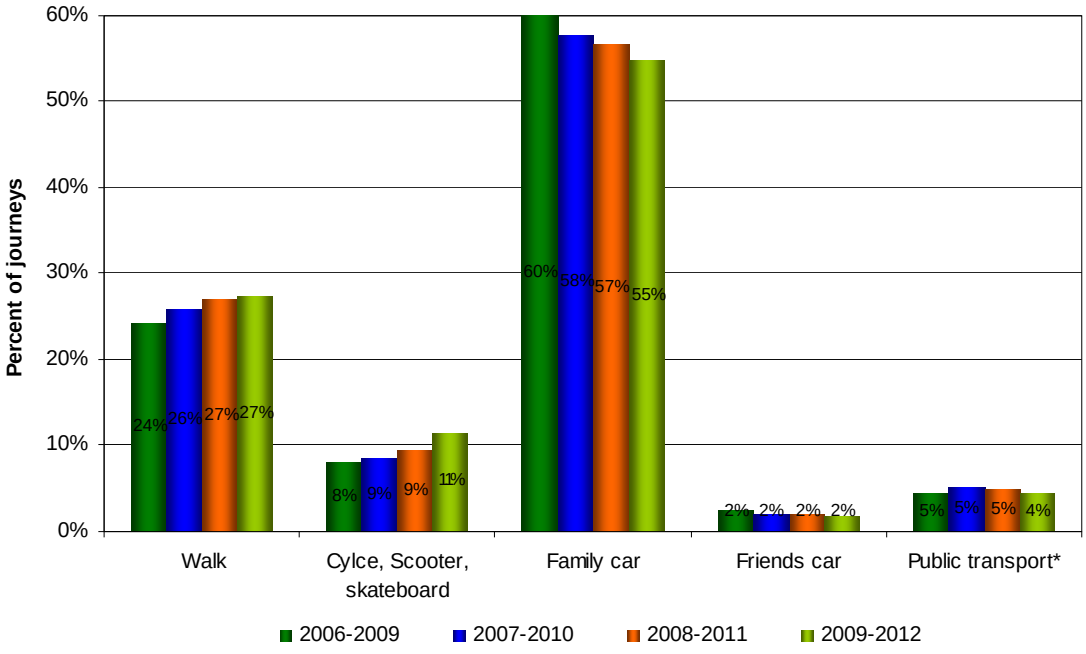
5.2 How the region's children travel to school

The STP surveys collect information from children about how they travel to school, including travel by vehicle, on foot, by bike and by public transport. Four years of STP data, from 2009-2012, for primary and intermediate age children has been pooled together to explore the school travel patterns in the Wellington region. Data for the 2006-2009, 2007-2010 and 2008-2011 periods is also presented for comparison.

5.2.1 Travel mode

Figure 11 shows the percentage of journeys (n=110,783) to school in the region by different modes over the 2009-2012 period. Data for the 2006-2009, 2007-2010 and 2008-2011 periods are shown for comparison. Data collected over the 2009-2012 period shows that around 57% of trips to school were by car (family car or friend's car), 27% were on foot, 11% by cycle, scooter or skateboard, and 4% by public transport.

Figure 11. Percent of journeys to school by mode, 2009-2012 and 2006-2009, 2007-2010 and 2008-2011



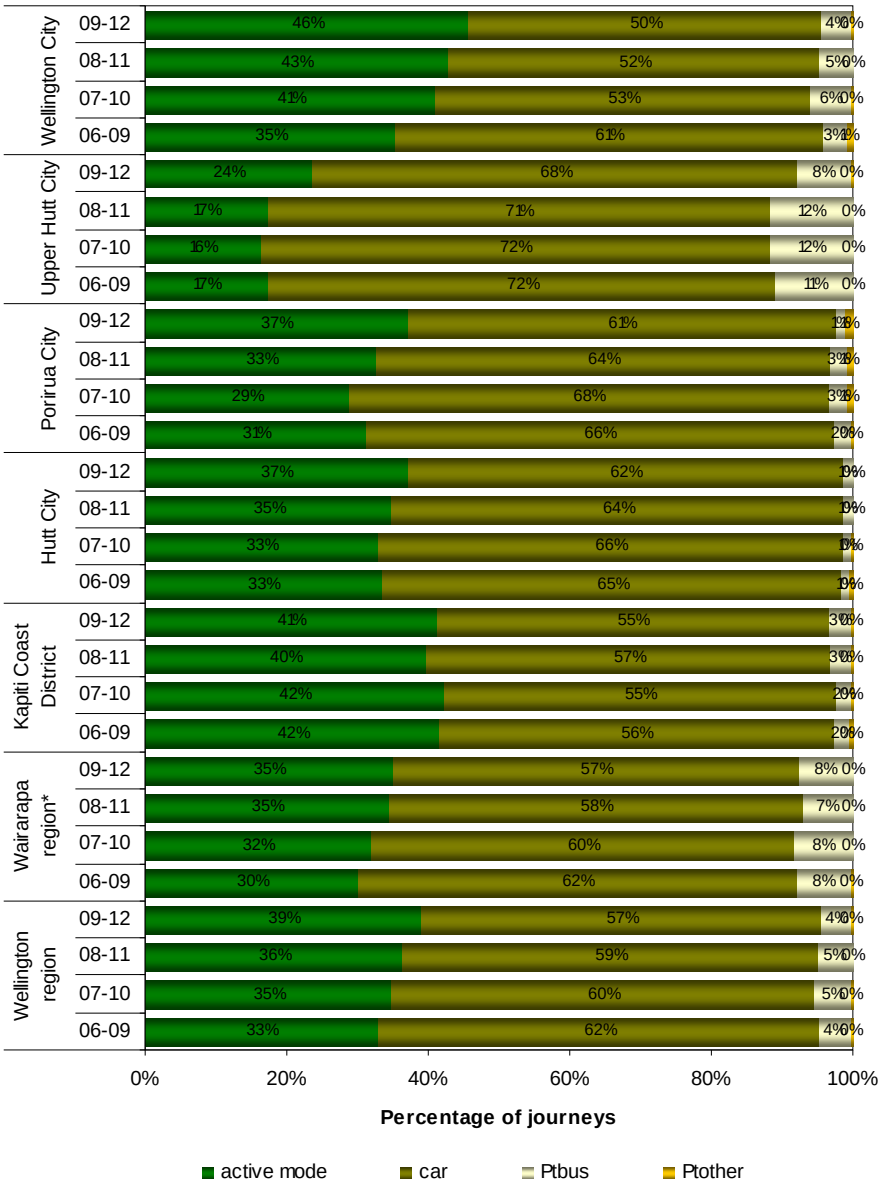
**Public transport includes bus, train and ferry

Comparing pooled data over time there has been a significant decrease in the percentage of trips to school across the region by car, and a significant increase in the percentage of trips by active modes. The percentage of car trips decreased from 62% in 2006-2009 to 57% in 2009-2012, whereas active mode trips (including walk, cycle, scooter and skateboard) increased from 32% to 39% over the same period.

Regional data from the New Zealand Household Travel Survey (NZHTS) (Ministry of Transport, 2012) over the 2008-2012 financial year period found that 59% of primary school children were driven to school (includes the categories passenger and car passenger + walk), 30% walked and one percent travelled by bike. Comparing the data from the STP programme and the NZHTS shows that lower proportions of students at schools in the STP programme are driven to school and higher proportions use active modes compared to the regional picture.

The mode share of travel to school for the individual TAs in the Wellington region is shown in Figure 12. Compared to the total region, there are a number of differences by TA for the 2009-2012 period. Children attending participating schools in Upper Hutt are less likely to use active modes to travel to school, whereas children going to participating schools in Wellington City and the Kapiti Coast are most likely to use active modes to travel to school. Children attending schools in Upper Hutt and the Wairarapa are more likely to travel to school by bus compared to the total region. Children attending schools in Upper Hutt are most likely to travel to school by car, followed by children attending schools in Hutt City and Porirua City. A similar pattern of mode use has been present since 2006-2009.

Figure 12. Percent of journeys to school by mode[7] for the individual territorial authorities, 2006-2009, 2007-2010, 2008-2011 and 2009-2012



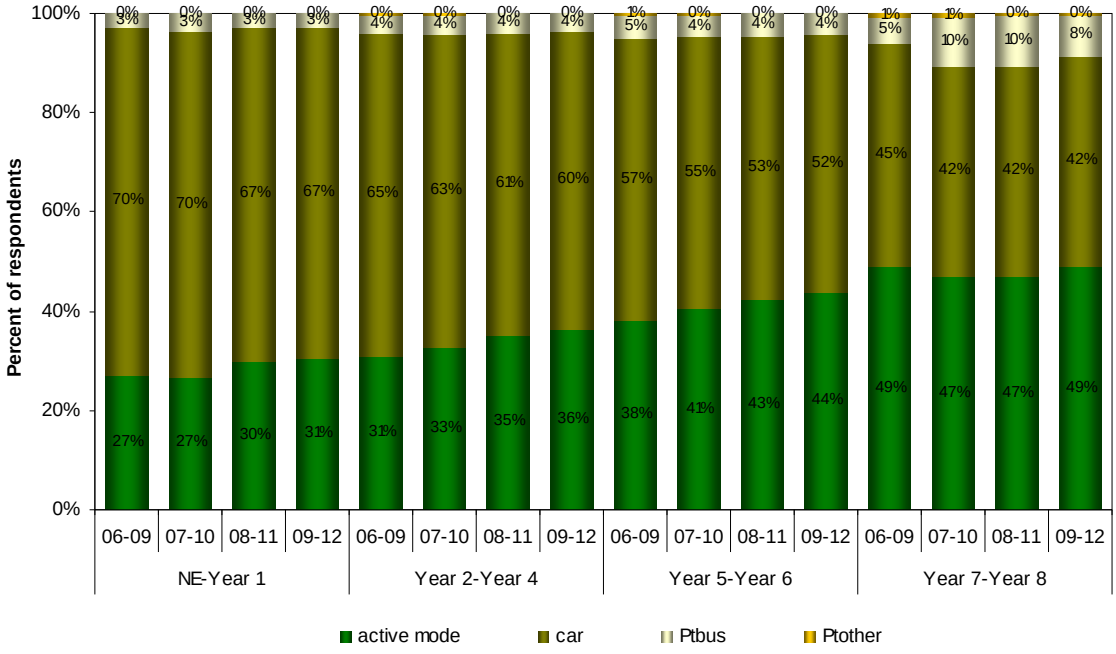
*Wairarapa region includes the Carterton District, Masterton District and South Wairarapa District.
Note: percentages not clearly visible are generally below 2%

[7] Active mode includes walk, cycle, scoot, skateboard and walking school bus; car includes family car and friend's car, Ptbus includes school and public bus; Ptother includes train, ferry and other modes.

Looking at the trends in mode share within individual TA's the majority have experienced positive shifts, with an increase in active mode use and a decrease in car use. The largest increases are observed in Wellington City, where active mode use at participating schools has increased from 35% in 2006-2011 to 46% in 2009-2012, and car use has decreased from 61% to 50%. Also of note are the changes in Wairarapa across the 2006-2009 to 2009-2012 period and the shifts in Upper Hutt City and Porirua City over the last two survey cycles. However, as there are so few schools enrolled in the STP programme in Porirua City, it is not possible to tell how much of the change in mode share is due to actual mode shifts or due to the travel behaviour of students from the new school that has joined the STP programme over the last year. However, as mentioned earlier in this report, as more and more schools join the STP programme this will increase our confidence that the observed mode changes are due to travel choice changes rather than the effect of a new school being added to the regional analysis.

A strong predictor of travel to school mode choice is the age of the student (Figure 13). As primary and intermediate age children get older they becoming less reliant on being driven and increasingly more likely to use active modes or public transport. In 2009-2012, 67% of new entrant-Year 1 students were driven to school, 31% used active modes, and 3% used public transport; whereas 42% of Year 7-Year 8 students were driven, 49% used active modes and 8% used public transport.

Figure 13. Mode of travel to school by year level of children, 2006-2009, 2007-2010, 2008-2011, 2009-2012



Note: percentages not clearly visible are generally below 2%

Comparing the four periods of pooled data, there has been a significant increase in the percentage of respondents, in New Entrant-Year 6 travelling to school by active mode and a decrease in the percentage travelling to school by car. The largest increases are observed for Year 5-Year 6 students. There has been little change in travel to school choice for Year 7-Year 8 students over this time.

5.2.2 Travel distance

The typical distances (median, mean and 5% trimmed mean[8]) children in the Wellington region travel to schools with STPs are shown in Table 5. The 5% trimmed mean distance to school, over the 2009-2012 period, for primary/intermediate age children was found to be 2.17km. Further analysis shows that the 5% trimmed mean distance to school by active modes is 1.12km and 2.79km by car, whereas the median distance is 0.91km by active modes and 1.87km by car. The 5% trimmed mean and median distance to school by active modes has remained relatively unchanged over the last few measurement periods. Other than a spike in the 5% trimmed mean by car in 2008-2011 this has remained relatively unchanged at around 2.80km, whereas there was little change in the median distance by car over the first three measurement periods, but this has decreased over the last measurement cycle.

Table 5. Kilometres travelled to school, 2006-2009, 2007-2010, 2008-2011 and 2009-20012

	Year	All modes	Car	Active
# of trips	**06-09**	40,926	25,568	13,480
	07-10	67,064	40,396	23,314
	08-11	79,159	47,124	28,454
	09-12	99,590	57,243	38,480
Median	**06-09**	1.51	1.99	0.83
	07-10	1.55	2.01	0.90
	08-11	1.53	2.00	0.91
	09-12	1.42	1.87	0.91
Mean	**06-09**	2.76	3.34	1.17
	07-10	2.67	3.29	1.20
	08-11	2.79	3.45	1.33
	09-12	2.61	3.28	1.27
5% trimmed mean	**06-09**	2.26	2.81	0.98
	07-10	2.25	2.80	1.06
	08-11	2.33	2.91	1.15
	09-12	2.17	2.79	1.12

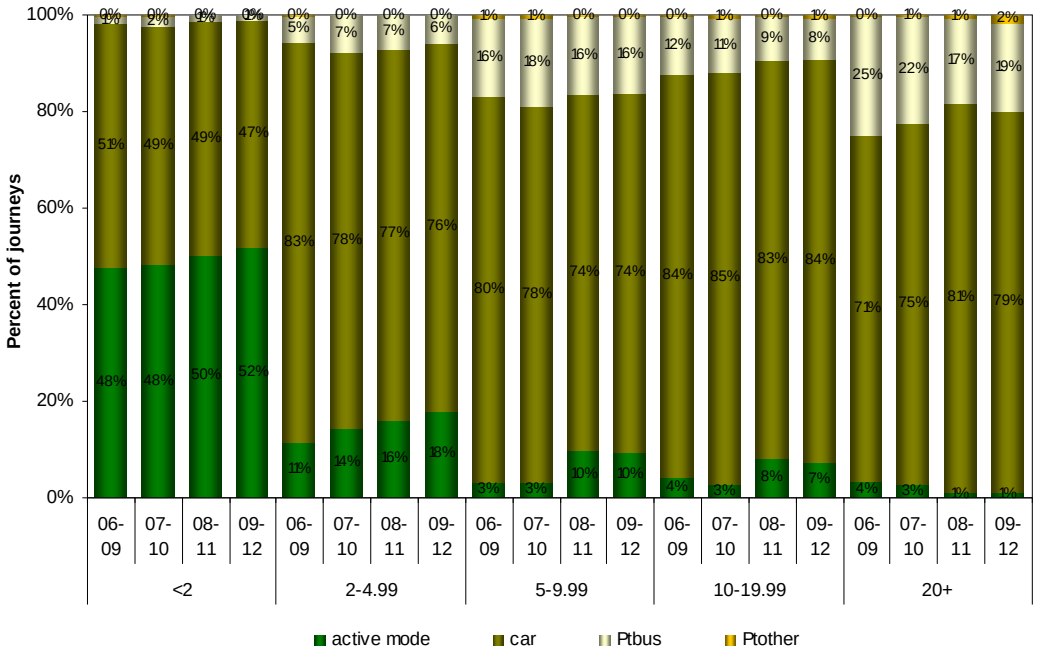
Short distances of less than 2km and less than 5km, from home to school, are of particular interest in school travel planning as these distances are often relatively easy to walk or cycle. Findings from the 2009-2012 class surveys show that 65% of children going to primary/intermediate schools with STPs in the region live within 2km of their school, 24% live 2-4.99km from school, a further 8% live between 5-9.99km and the remaining 4% live 10km or more from school.

The mode of travel to school by distance travelled is shown in Figure 14. From the pooled 2009-2012 data it is found that just over half (52%) of students that live within 2km of school travel by active modes. This reduces to 18% for students living 2-4.99km from school. The percentage of short journeys to school by active modes has gradually increased since 2006-2009, but there are still large numbers of car trips to

[8] 5% trimming removes the largest 5% of values, and the smallest 5% of values before the mean is calculated. This reduces the effect of outlier/extreme values.

school that are less than 5km in length. In 2009-2012, 55% of trips less than 5km are by car, and 43% are by active modes.

Figure 14. Mode of travel to school by distance travelled, 2006-2009, 2007-2010, 2008-2011 and 2009-2012



Note: percentages not clearly visible are generally below 2%

If this information is assumed to be representative of the entire Wellington region,[9] as a conservative estimate, there could be around 13,600 car journeys to primary/intermediate schools across the region, per day, that are less than 5km in length.

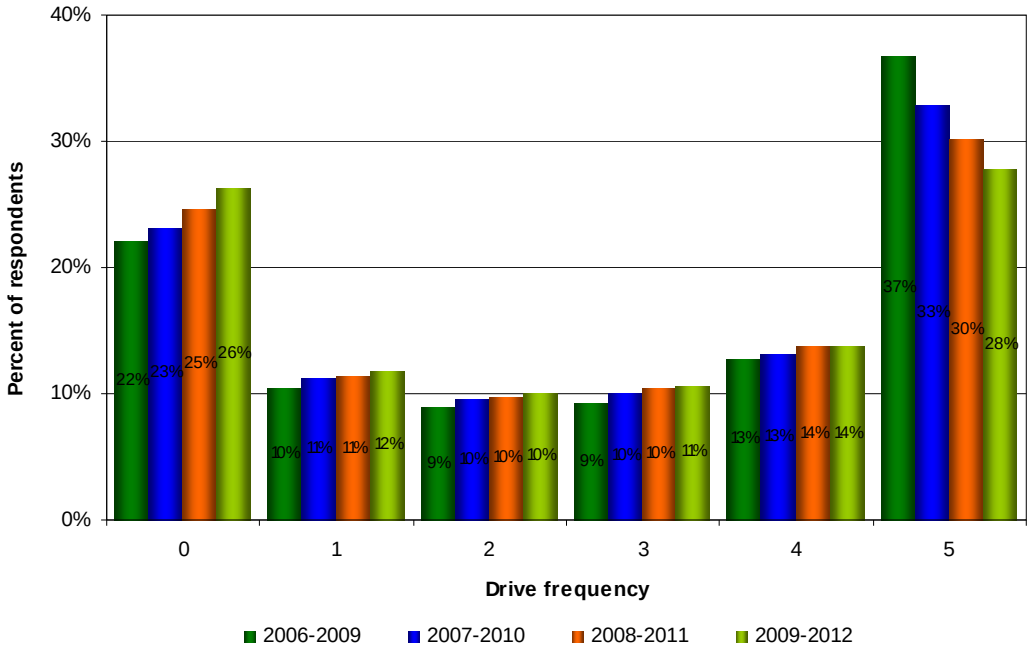
5.2.3 Frequency of travel by car

One of the aims of the STP programme is to reduce the proportion of school children in the region travelling to school by car. Analysis of class survey information from 2009-2012 shows that 74% of children are driven to school at least once a week, with 28% of being driven five times a week, and 46% being driven between one and four times a week (see Figure 15).

At a regional level, based on the observed drive frequencies in 2009-2012 and generously assuming each parent drives two children to school, in 2012 there would have been around 64,000 car trips to primary/intermediate schools in the region per week (12,800 per weekday).[10]

[9] Based on the number of primary/intermediate age children in 2012 (Table 1) and assuming (generously) that there are two children in every car journey to school.
[10] This is likely to be an underestimate as there are usually less than two children per car.

Figure 15. Weekly drive frequency to school, 2006-2009, 2007-2010, 2008-2011 and 2009-2012



5.2.4 Regression analysis

When looking at related factors one at a time a number of significant relationships appear, but it is hard to tell if these are due to correlations between the variables. To look at this issue regression analysis has been conducted to further investigate the variables that appear to have a significant relationship with active mode use (student year level, distance to school and TA). The regression found that distance travelled to school has the strongest relationship with active mode use, student year level has a moderate relationship (but is half that of distance travelled), and going to school in a particular TA does not have a significant relationship. These results tell us that the closer someone lives to a school, and the older a student is the more likely they are to use active modes to travel to school. And although differences by TA are observed when analysed in isolation, these all but disappear when distance to school and student year level are also taken into account.

Also of interest from the regression analysis was that only 45% of the variation in active mode use could be explained by distance travelled to school and student year level. This suggests there are a number of other factors, not investigated here, that influence whether a child will use active modes to travel to school.

5.3 Summary

This work continues to provide an annual picture of travel to school in the Wellington region, on a four-yearly moving average basis. To date, analysis has looked at the overlapping time periods, 2006-2009, 2007-2010, 2008-2011 and 2009-2012, to provide a large enough sample size and a pool of schools that cover the entire Wellington region (all TAs). With four time periods of data now available it is possible to examine trends in the region's travel to school behaviour. As more schools become part of the region's STP programme this data will become more reliable.

Over the 2009-2012 period, around 57% of travel to school, for primary/intermediate age children in the region, was by car (family car or friend's car), 39% was by active modes (walk, cycle, scooter or skateboard), and 4% was by public transport (bus, train and ferry). Over time, the STP data shows that there has been an increase in active mode travel to school (from 24% in 2006-2009 to 27% in 2009-2012) and a decrease in travel to school by car (from 62% in 2006-2009 to 57% in 2009-2012) for primary/intermediate age children. There has been no change in public transport use. Comparing the data from the STP programme to data from the NZHTS shows that lower proportions of students at schools in the STP programme are driven to school and higher proportions use active modes compared to the regional picture.

There are a number of differences in travel to school mode choice across the region. Compared to the total region, children in Wellington City and the Kapiti Coast District are more likely to use active modes to travel to school; whereas children in Upper Hutt, followed by Hutt City and Porirua City are more likely to travel by car. Mode of travel to school in the region is also found to be highly dependent on the age of the child, with older children becoming less reliant on being driven and increasingly more likely to use active modes of travel to school.

Short distances of less than 2km and less than 5km, from home to school, are of particular interest in school travel planning as these distances are often relatively easy to walk, cycle, scoot or skateboard. Data from STPs over the 2009-2012 period shows that around 88% of children live within 5km of their school. Even though the vast majority of children live within 5km of their school, around 55% of these short trips to school are currently by car with 43% using active modes. This illustrates that there is plenty of scope across the region for shifting children's mode of travel to school away from car travel.

Of the three factors (student year level, distance to school and TA) that appeared to have a significant relationship with active mode use, regression analysis found that distance travelled to school has the strongest relationship, student year level has a moderate relationship (but is half that of distance travelled), and going to school in a particular TA does not have a significant relationship. These results tell us that the closer someone lives to a school, and the older a student is the more likely they are to use active modes to travel to school. And although differences by TA are observed when analysed in isolation, these all but disappear when distance to school and student year level are also taken into account.

Also of interest from the regression analysis, was that only 45% of the variation in active mode use could be explained by distance travelled to school and student year level. This suggests there are a number of other factors, not investigated here, that influence whether a child will use active modes to travel to school.

The parent survey questions pertaining to safety were rewritten for the 2011 survey to reflect the changing information needs. As this is only the second year data has been collected for these questions it's not possible to look at how parents' perceptions of safety have changed over time. As a baseline this information tells us that the vast majority of parents are confident teaching road safety to their children. However, around half (51%) of parents disagree (selecting *disagree* or *strongly disagree*) that people drive safely near our school, and higher proportions of parents agree (selecting *agree* or *strongly agree*) that children are safe walking (65%) to our school, compared

to cycling to our school (40%). Regional data from the Transport Perceptions Survey (2012) aligns with these latter findings showing that respondents are more likely to believe that children are safe walking to school compared to cycling to school.

6. Evaluation of School Travel Plans

Up to the end of the 2012 school year, there were 26 schools that had completed class baseline and evaluation travel surveys. The data from these schools is presented in this chapter to look at the travel to school changes for those schools that have implemented STP activities.

6.1 Travel safety

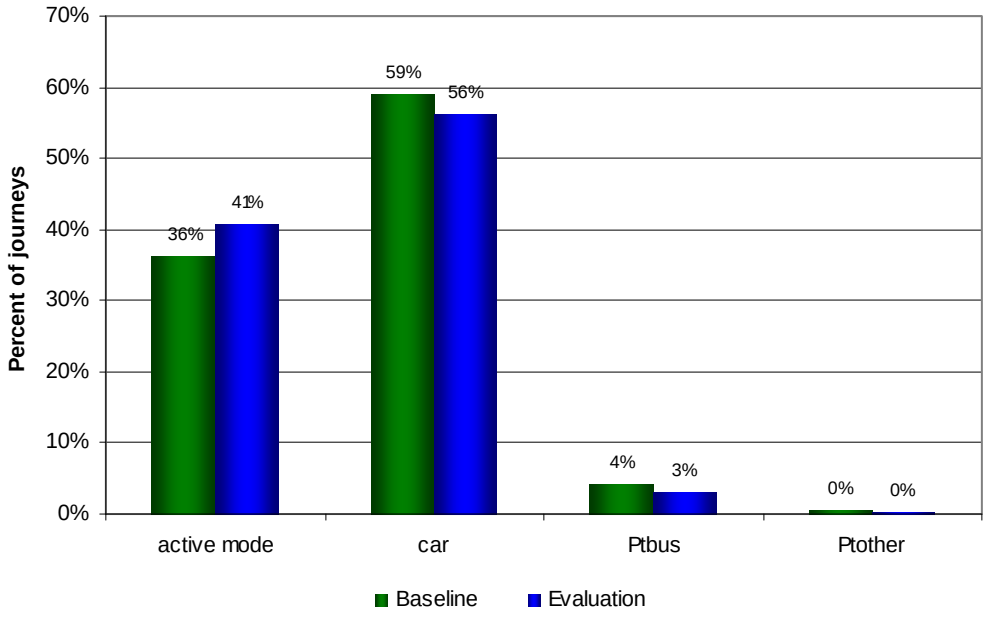
Evaluation of the STP programme in the Auckland region found that stakeholders thought that the success of the programme should be measured on both modal shift change and improved safety for child pedestrians and cyclists (ARTA, 2008). Auckland travel co-ordinators also commented that shifting parent's perceptions about safety was essential in order to achieve reductions in car use.

The safety questions in the Wellington region's STP programme were rewritten for 2011 to reflect the findings from the Auckland study and the priorities outlined in New Zealand's Road Safety Strategy (Ministry of Transport 2010). The rewriting of these questions means that currently no information is available for schools which have completed baseline and evaluation surveys.

6.2 Modal shift in schools with travel plans

From the class travel survey data, the region's schools with travel plans have achieved a statistically significant increase (4.6 percentage points) in the percentage of journeys to school by active modes (see Figure 16). A corresponding decline (3.0 percentage points) in car use is also observed.

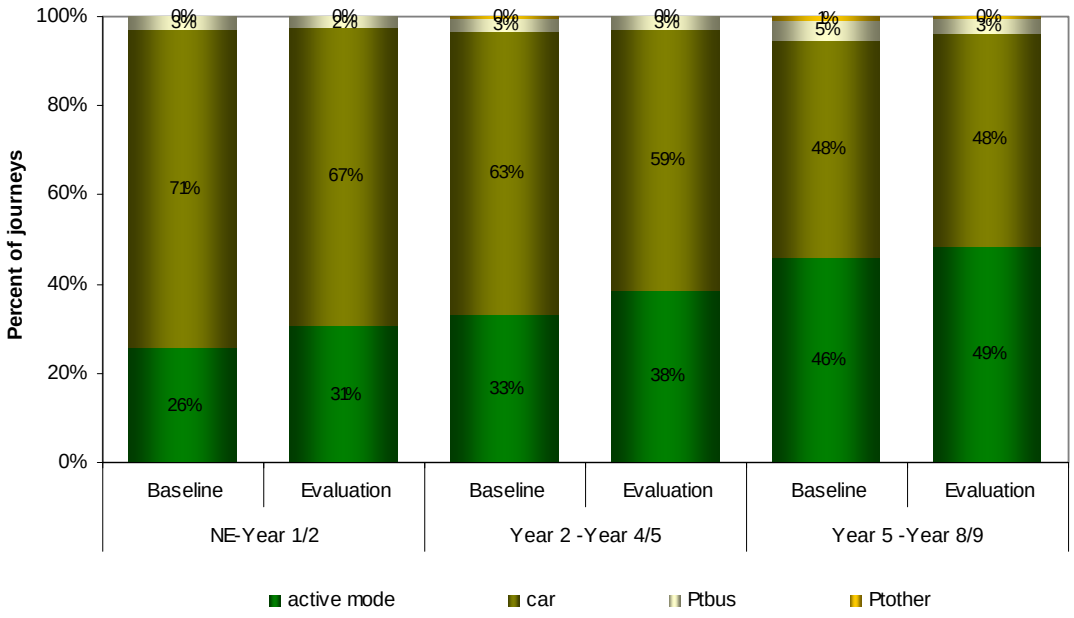
Figure 16. Change in mode of travel to school between class baseline and evaluation surveys



6.3 Mode shift by year level

The age of the student has been found to be a strong predictor of mode of travel to school in the Wellington region (see section 5.2.1 in this report), and for other regions (ARTA, 2008) and New Zealand nationally (Ministry of Transport, 2009). Figure 17 shows the change in mode of travel to school between class baseline and evaluation survey data by student year level.

Figure 17. Change in mode of travel to school between class baseline and evaluation surveys, by student year level



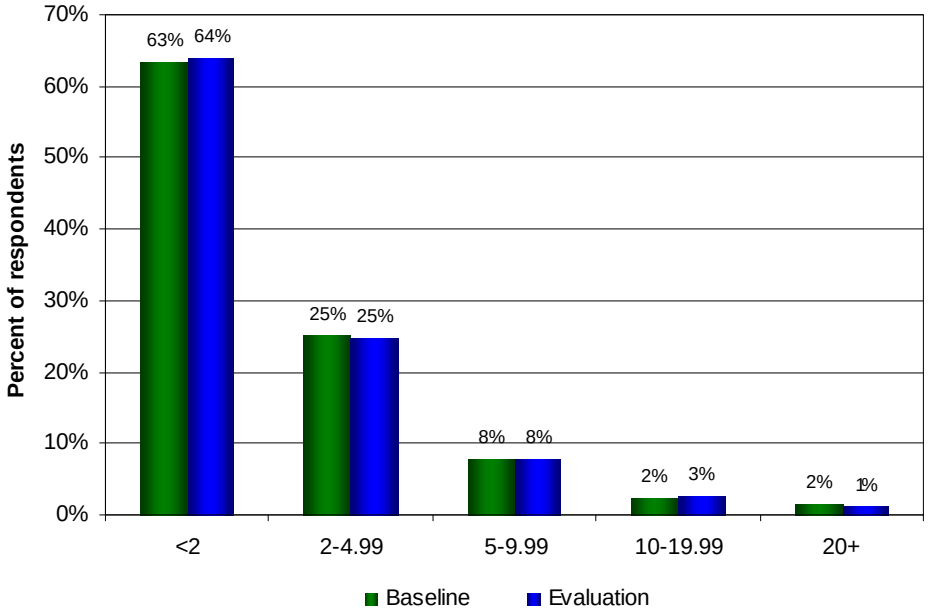
All age groups have seen an increase in their active mode use for travel to schools that have implemented STP activities, although the increases are greater for younger (NE-Year 4/5) rather than older (Year 5-Year 8/9) primary/intermediate students. A corresponding decrease in journeys by car is observed for younger students (NE-Year 4/5), but there has been no change for the older students (Year 5-Year 8/9), and instead a decrease in public transport journeys is observed.

6.4 Modal shift by distance travelled to school

Short distances of less than 2km and less than 5km, from home to school, are of particular interest in school travel planning as these distances are often relatively easy to walk, cycle, scoot or skateboard. Therefore, mode of travel to school is also influenced by the distance between a child's home and their school, with active modes of transport becoming less feasible for longer journeys to school.

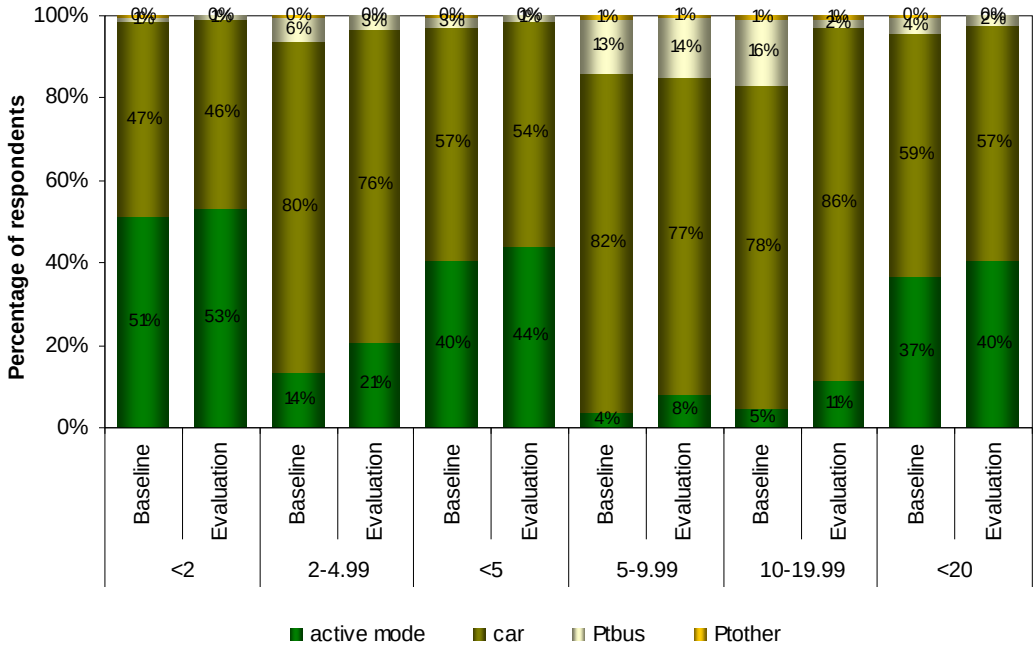
Figure 18 shows the distances children travel to their school from the baseline and evaluation surveys. In both the baseline and evaluation surveys, around 88% of students live within 5km of their school.

Figure 18. Change in distance travelled to school between class baseline and evaluation surveys



The change in mode of travel to school between class baseline and evaluation surveys, by distance from home to school is shown in Figure 19. For students who live within 5km of their school there has been a significant increase in the proportion using active modes to get to school (from 40% to 44%), and a significant decrease in car use (from 57% to 54%). The largest shift in active mode use was observed for students living within 2-4.99km of their school, with a seven percentage point increase (14% to 21%) in the use of active modes and a four percentage point decrease (80% to 76%) in car use to travel to school.

Figure 19. Change in mode of travel to school between class baseline and evaluation surveys, by distance travelled to school



There were also significant shifts for those students living between 5km and 9.99km from their school, with an increase in active mode use and a decrease in car use for travel to school. Due to the small number of students living more than 10km 10-from their school, none of the observed changes are significant.

At the 26 primary/intermediate schools in the evaluation, there has been an increase of around 315 active mode trips to these schools each day for students that live within 5km of their school. This amounts to over 60,000 more active mode trips to these schools per school year.

If this level of mode shift was observed for all primary/intermediate students across the Wellington region who live within 5km of their school, based on 2012 rolls, there could be around 1,600 more active mode trips per day, and over 320,000 per school year. Changes in the number of car trips are detailed in the next section.

6.5 Trip reduction

Currently there are 26 schools in the Wellington region that have been involved in the STP programme long enough to have completed both baseline and evaluation surveys. Based only on the students from these schools that live within 5km of their school, and if we assume (generously) each parent drives two children to school, there may have been around 100 fewer car trips to these schools each day (19,000 fewer each school year).[11]

Table 6 shows the estimated reduction in car trips for the students (living within 5km of their school) at the evaluation schools and for all primary/intermediate students across the region. It also shows the resulting reduction in vehicle kilometres travelled (VKT) and CO_2 emissions. The reduction in car trips to schools that have participated in the STP evaluation reduced vehicle kilometres travelled by 53,500km each year and reduced CO_2 emissions by 18.5 tonnes each year.

If the schools in the evaluation are assumed to be representative of the Wellington region, the STP programme could reduce the number of car trips, of primary/intermediate students who live within 5km of their school, by 500 car trips per day (100,000 fewer per school year).[12] This equates to 281,000 fewer vehicle kilometres travelled and a reduction in CO_2 emissions of 97.3 tonnes.

[11] This is likely to be an underestimate as there are usually less than two children per car.
[12] This is likely to be an underestimate as there are usually less than two children per car.

Table 6. VKT and CO_2 reduction for the STP programme, for students living within 5km of their school

	Total students	Car trips to school saved per year*	Reduction in vehicle kilometres to school each year**	CO_2 reduction per year*** (tonnes)
At evaluation schools	9465	19,183	53,522	18.5
All primary/intermediate regional schools	49,733	100,798	281,225	97.3

*School runs for a total of 196 days per year and assuming two children travel in each car

**Assuming each trip is 2.79km in length (the 5% trimmed mean car distance travelled to school for students in the region, 2009-2012-see Table 5. This will be an overestimate as 2.79km is for all students not just those living within 5km of their school.

***Fleet weighted exhaust emissions factor for CO_2 = 346g/km (Ministry for the Environment, 2008)

Whilst it is encouraging to see a reduction in car trips following STP activities, it is acknowledged that reducing car trips to school still may not stop the car trip occurring altogether as a number of parents are already driving (Durling & Winslow, 2011) when they drop their child off to school. Even if a number of car trips are still occurring, the finding that school travel planning has increased active travel to school is still important, especially in terms of the health benefits for students.

6.6 Summary

Currently there are 26 primary/intermediate schools in the Wellington region that have been in the STP programme long enough to have implemented some travel plan activities and participate in an evaluation survey. The number of schools is increasing each year making further analyses possible and more reliable.

Evaluation results to date are encouraging. There has been a significant increase in travel to these schools by active modes and a significant decrease in travel by car. Although older students are more likely to travel to school by active modes, it is the younger students who have experienced the largest increases in active mode use between the baseline and evaluation measurements.

Mode of travel to school is strongly influenced by the distance a child has to travel to school, with active modes of transport not feasible for longer journeys to school. Analysis of mode of travel to school for those students that live within 5km of their school showed significant increases in the proportion of students using active modes to travel to school since the schools became involved in the STP programme. A decrease in the proportion of students travelling to school by car is also observed.

Since the introduction of the STP programme, at the 26 schools that have participated in evaluation surveys, it is estimated that at a minimum there has been an increase of around 315 active mode trips and a decrease of around 100 car trips[13] to these schools each morning for students living within 5km of their school. If these changes were observed across the whole Wellington region there could be around 1,600 more active mode trips and at least 500 fewer car trips to primary/intermediate schools each morning.

[13] Car trip estimates assume there are two children in every car. This is likely to result in an underestimate as there are usually less than two children per car.

The reduction in car trips means that there will be a reduction in vehicle kilometres travelled, which brings with it an associated decrease in CO_2 emissions from car travel to school. Whilst it is encouraging to see a reduction in car trips for travel to school following the STP programme, it is acknowledged that reducing car trips to school still may not stop the car trip occurring altogether, as a number of parents are already driving when they drop their child off to school. Even if a number of car trips are still occurring, the finding that school travel planning has increased active travel to school is still important, especially in terms of the health benefits for students.

Initial findings from the schools included in this evaluation is encouraging and shows some positive shifts towards achieving some of the programme's aims. Each year increasing numbers of schools are signing up to the STP programme, and of the schools at the evaluation stage, significant increases in active mode trips and decreases in car trips have been observed. A move away from a dependence on car travel suggests that parents are becoming increasingly aware of other travel to school options. It will be interesting to see, when further safety information becomes available, whether this has an impact on parents' perceptions of safety.

7. References

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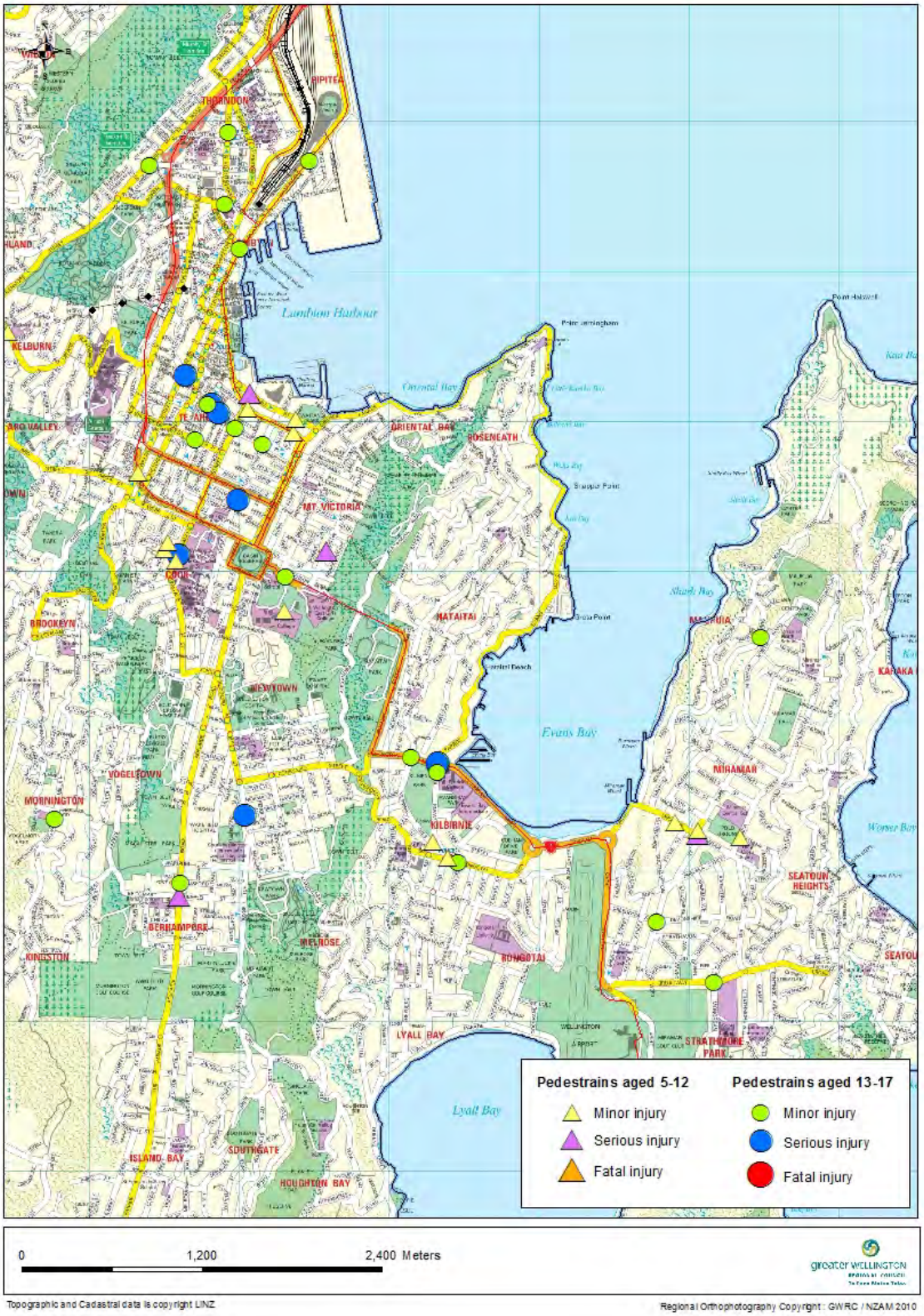
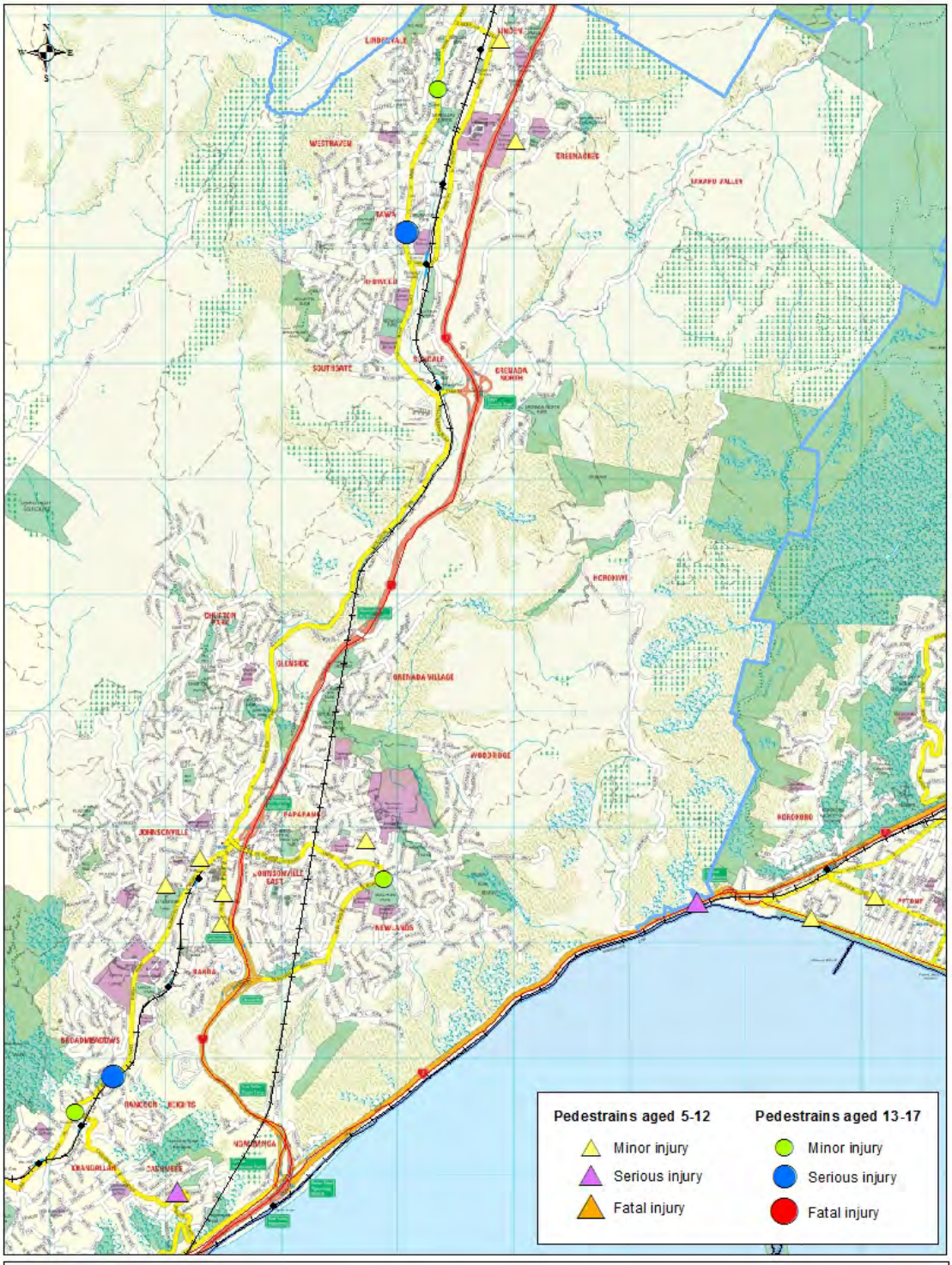
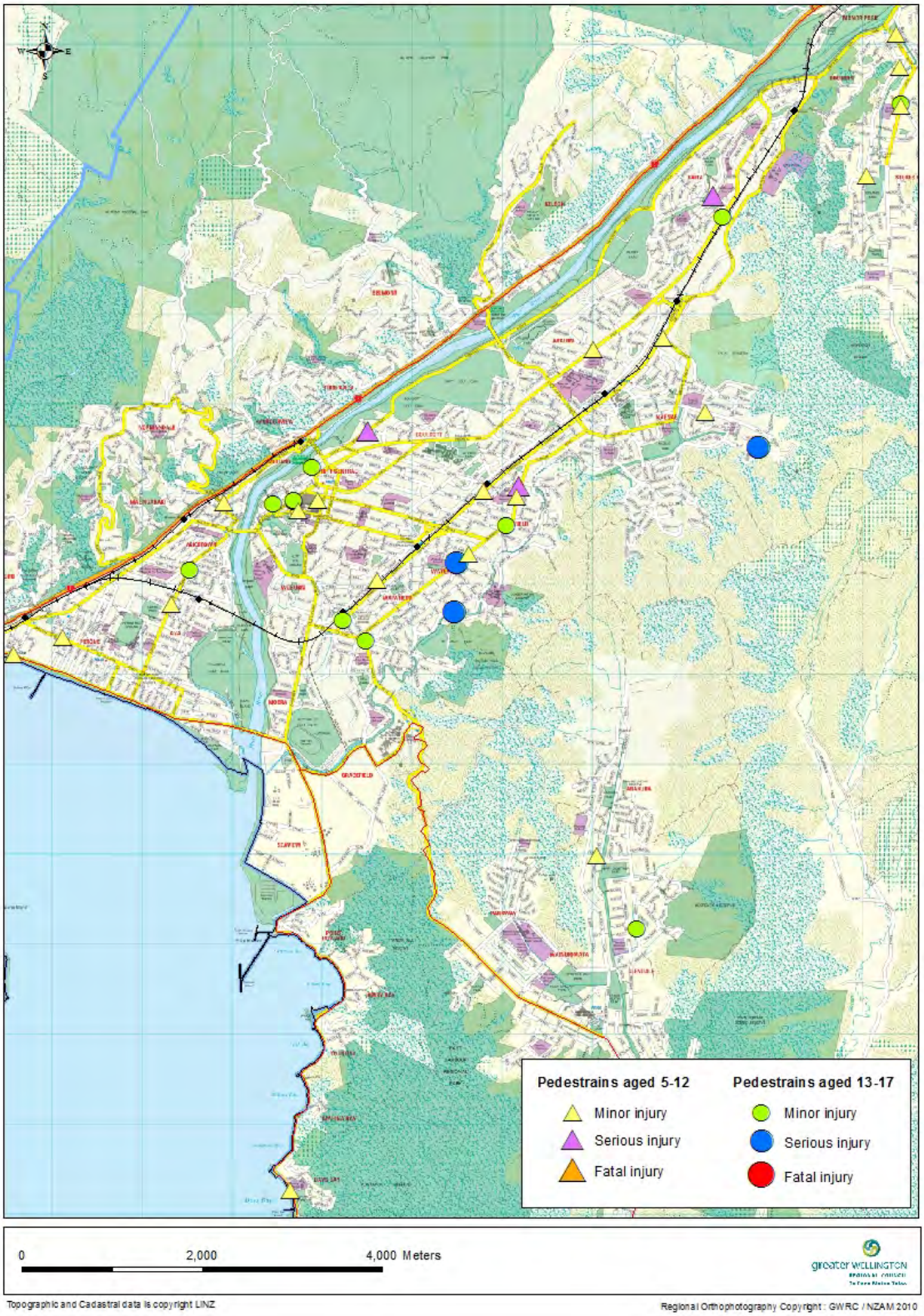
Appendix 1: Location of school age pedestrian casualties

Location of school age pedestrian casualties in Wellington City by injury severity, 2009-2012





Location of school age pedestrian casualties in Hutt City by injury severity, 2009-2012



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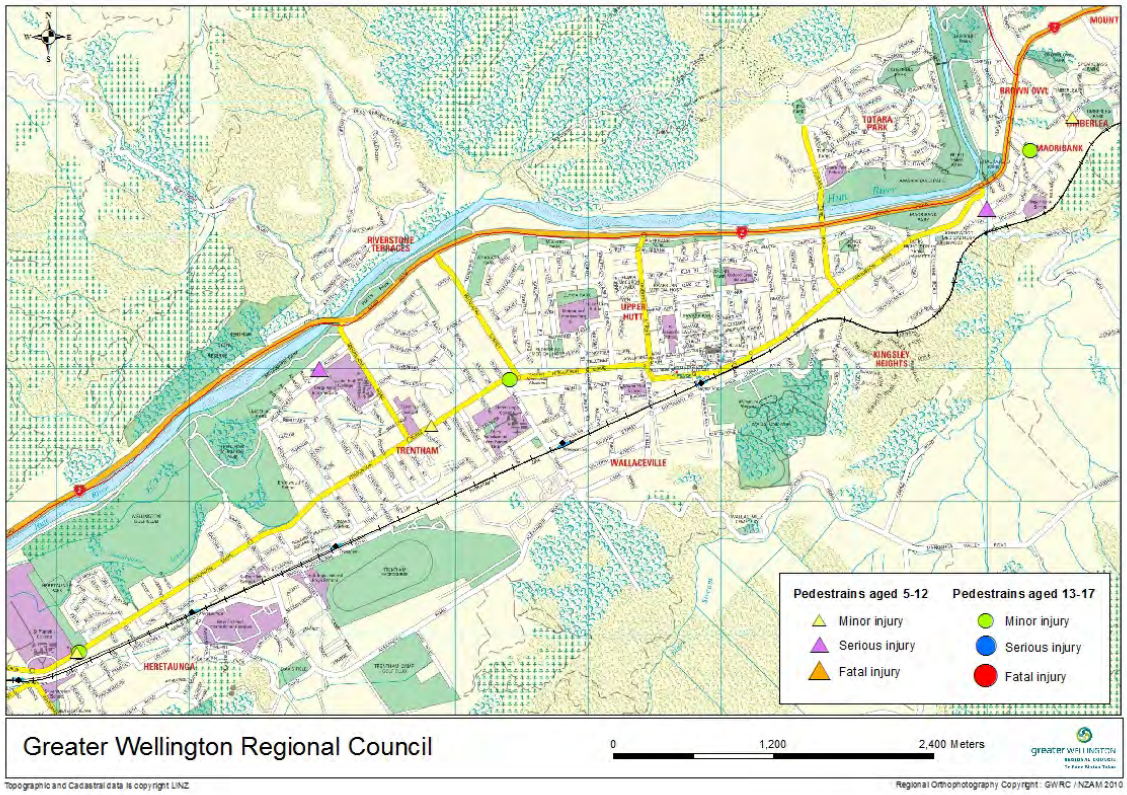
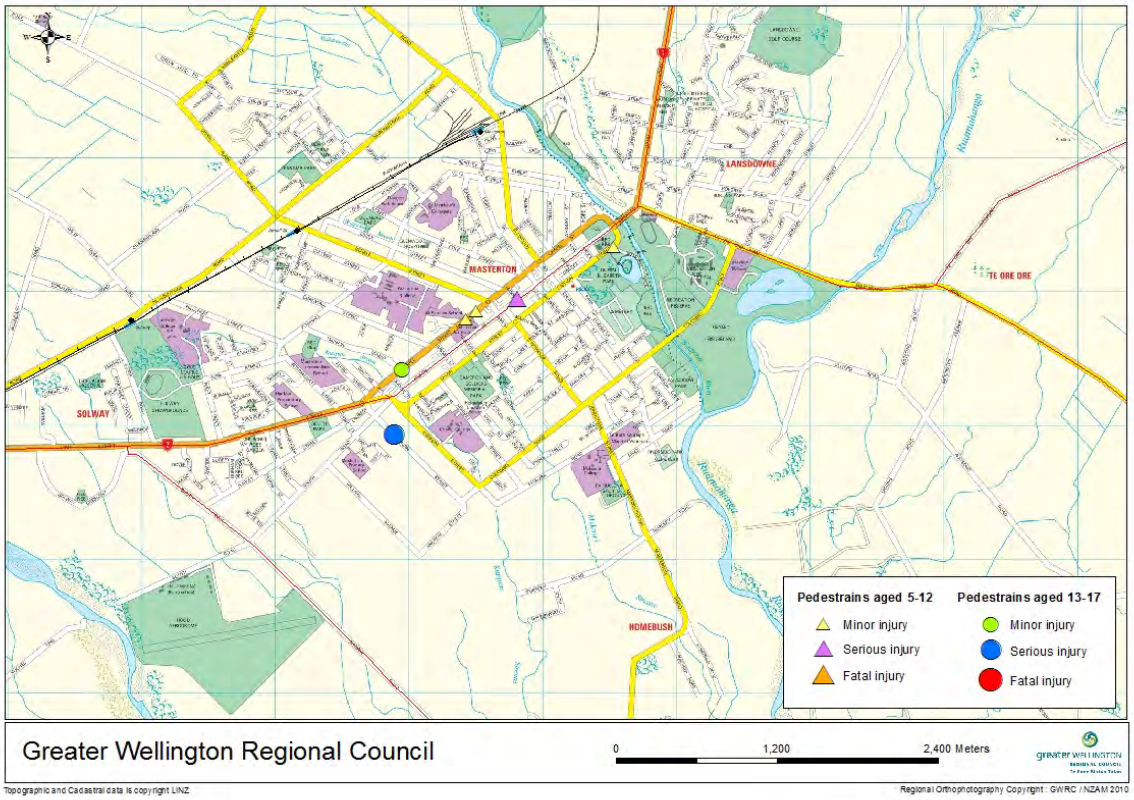
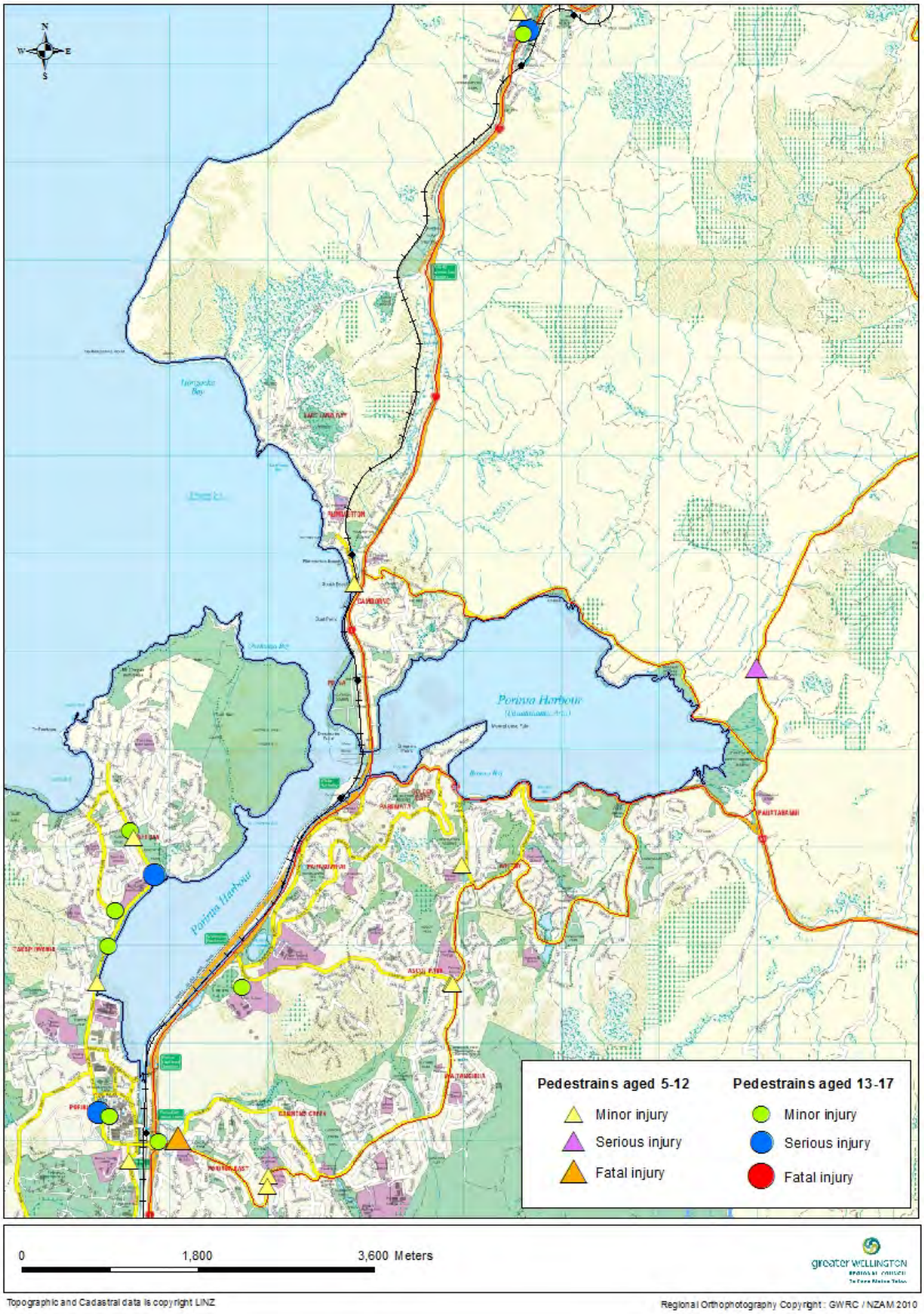
Location of school age pedestrian casualties in Upper Hutt City by injury severity, 2009-2012



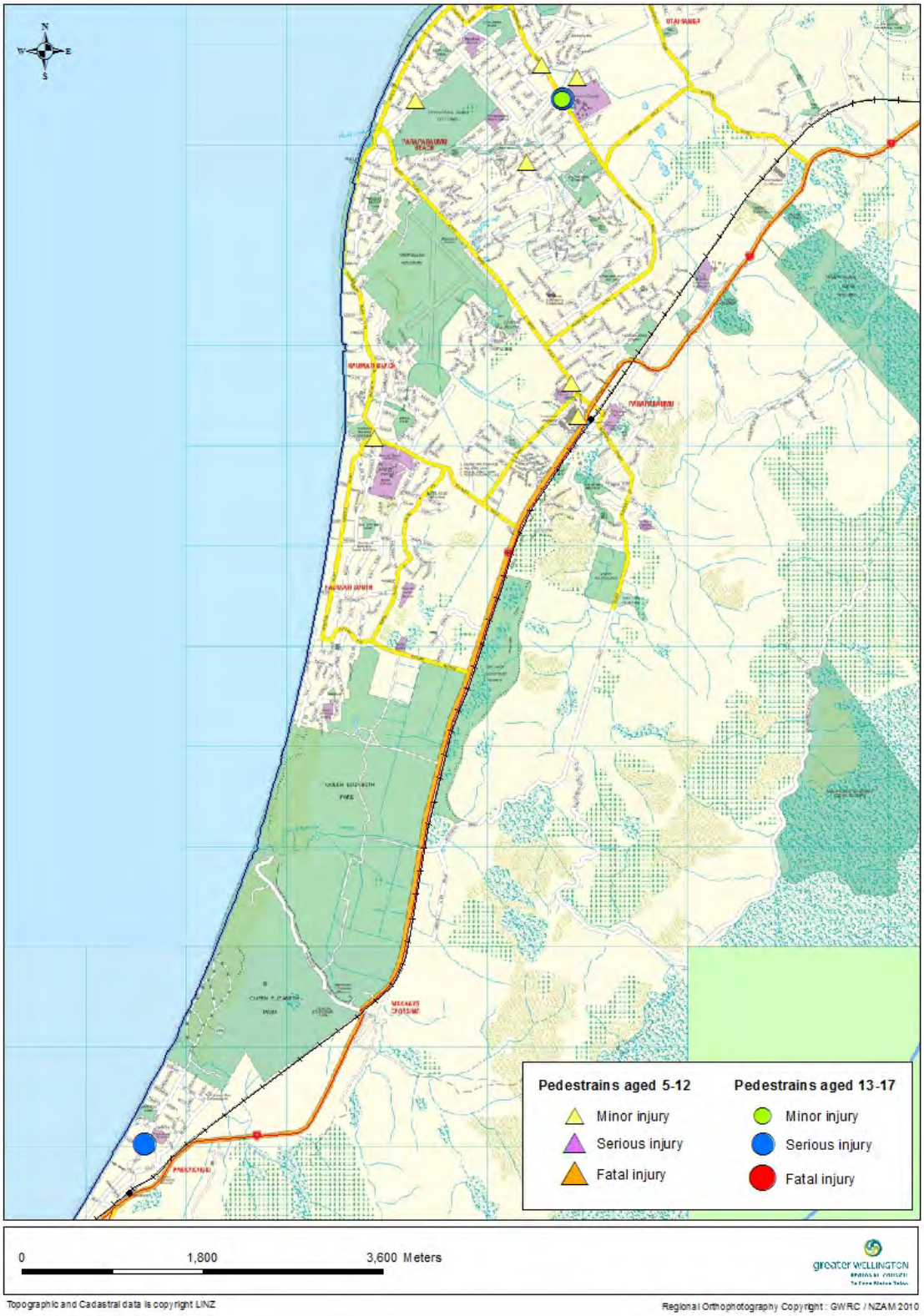
Location of school age pedestrian casualties in Masterton District by injury severity, 2009-2012



Location of school age pedestrian casualties in Porirua City by injury severity, 2009-2012

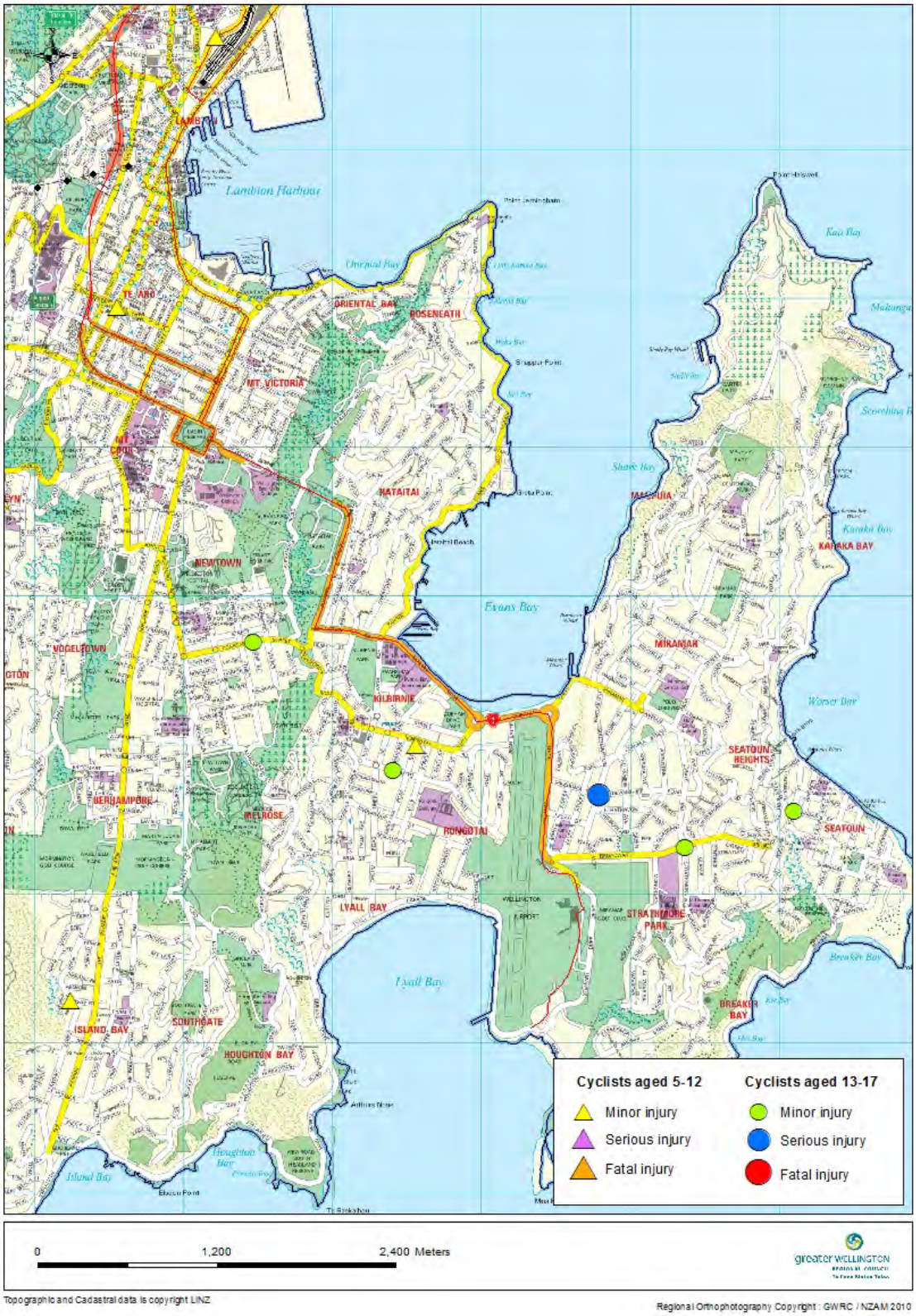


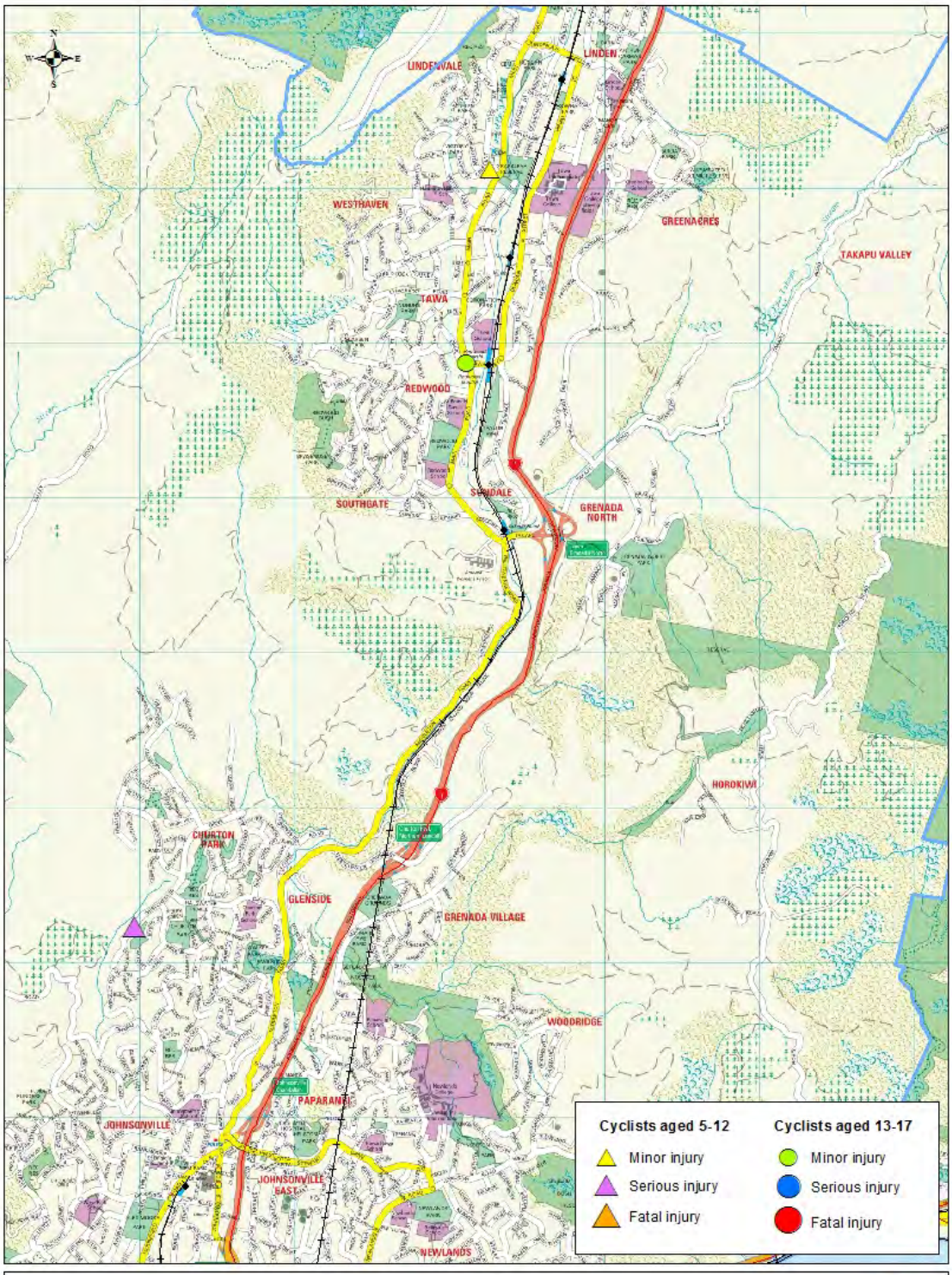
Location of school age pedestrian casualties in Kapiti Coast by injury severity, 2009-2012



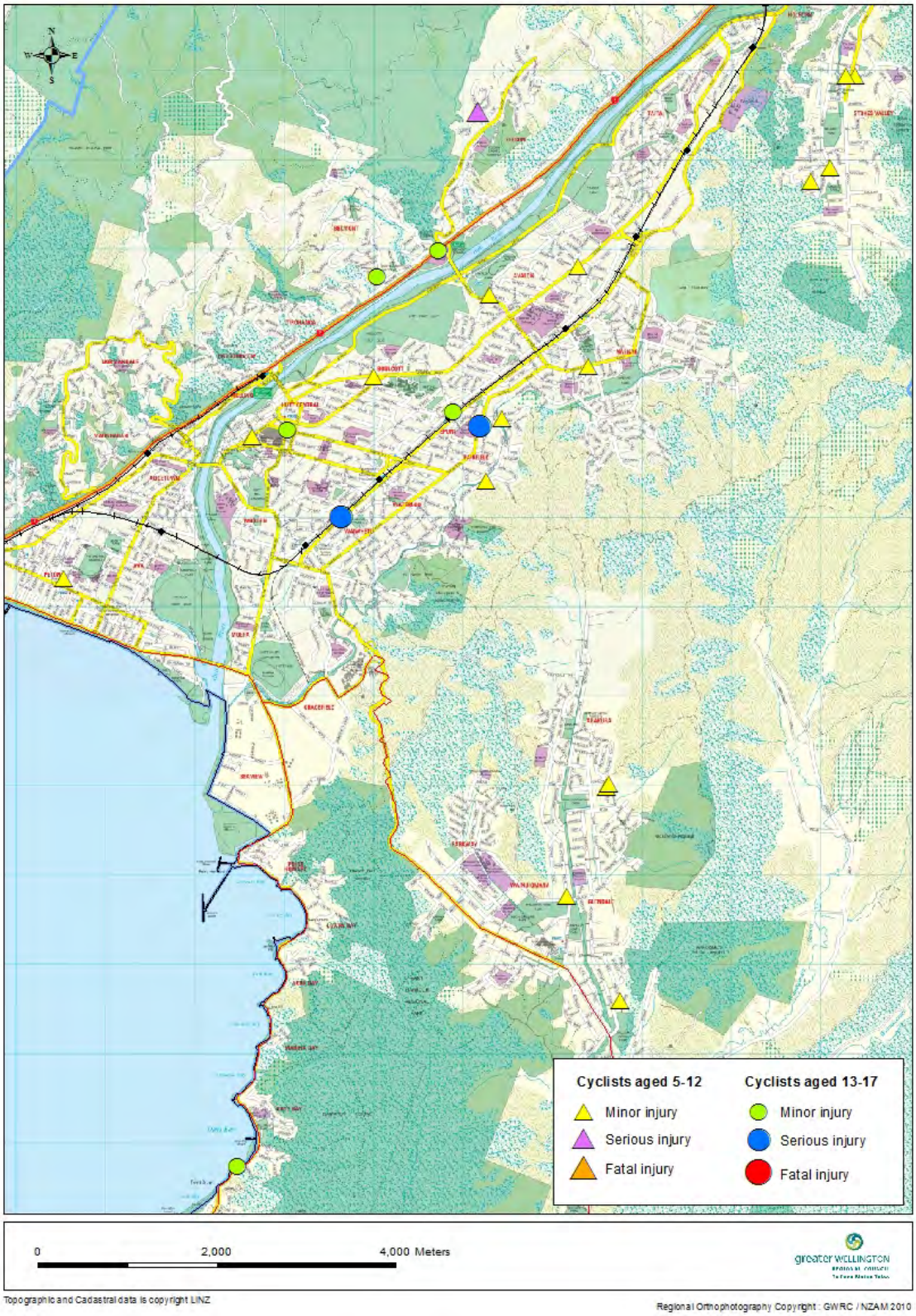
Appendix 2: Location of school age cyclist casualties

Location of school age cyclist casualties in Wellington City by injury severity, 2009-2012

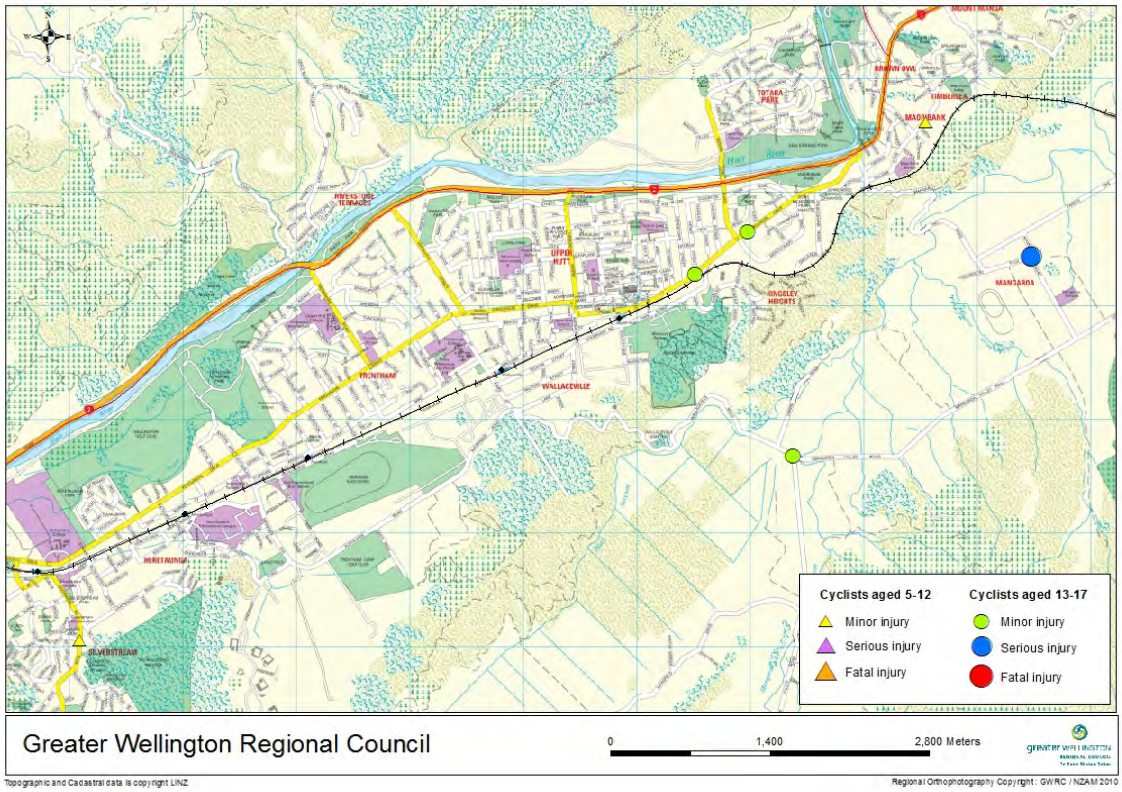




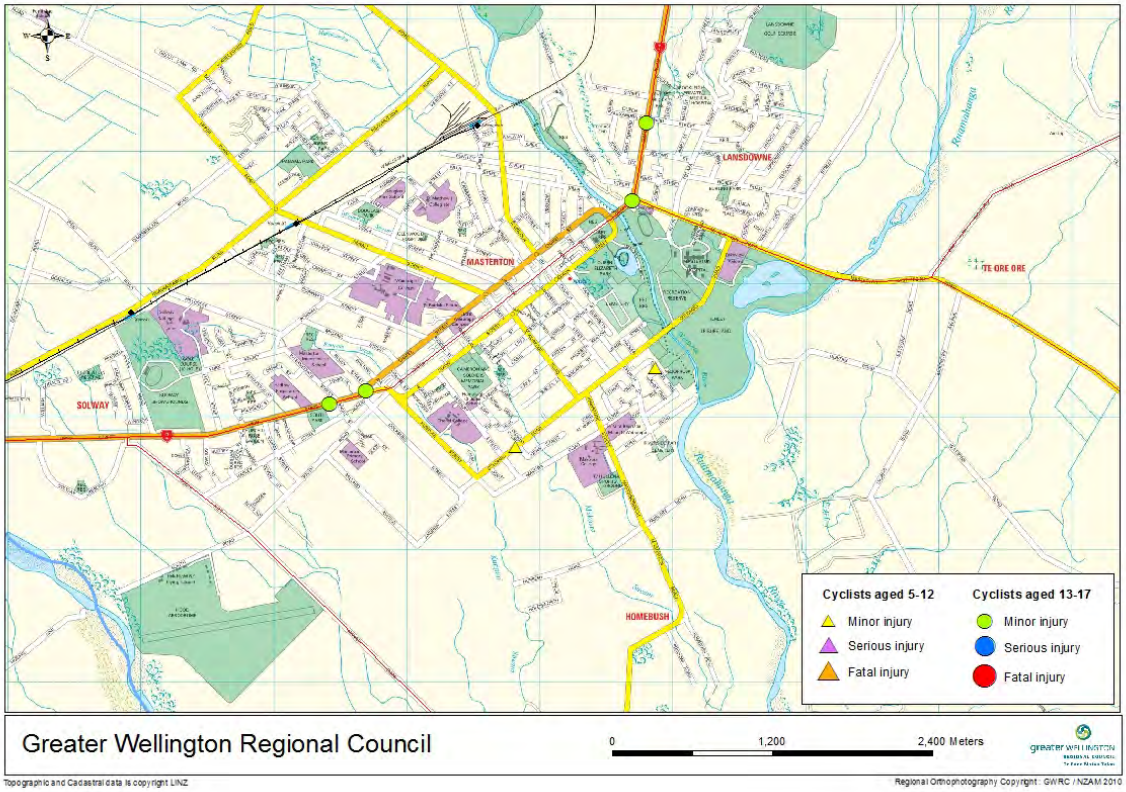
Location of school age cyclist casualties in Hutt City by injury severity, 2009-2012



Location of school age cyclist casualties in Upper Hutt City by injury severity, 2009-2012



Location of school age cyclist casualties in Masterton District by injury severity, 2009-2012



Location of school age cyclist casualties in Porirua City by injury severity, 2009-2012

Location of school age cyclist casualties in Kapiti Coast by injury severity, 2009-2012