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Research Report Prepared for
Auckland Transport

6th May 2011

2011 Auckland Region Manual Cycle Monitor

- Howick Ward -

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TABLE OF CONTENTS

APPENDICES

1. HOWICK WARD SUMMARY OF RESULTS

1.1 Introduction

The Need For Reliable Cycle Trip Data

Monitoring cycle movements and cycle traffic is important to Auckland Transport, to identify where investment may be needed to improve infrastructure for cycling. Cycle traffic data will also help Auckland Transport prioritise future funding through the Auckland Land Transport Programme[1].

Cycle traffic data will help inform a major programme of improvements for cycling in the Auckland region. In 2007, over $100 million was planned to be invested in building over 50% of the Regional Cycle Network by 2016. By mid 2009, 21% of the Regional Cycle Network had been built. Comprehensive cycle data assists with the development of the region's cycle network and prioritisation of projects.

This cycle monitoring gives precise cycle traffic information for a number of locations across the region, which can guide investment in infrastructure and other programmes. It also allows Auckland Transport to track progress against a quality baseline over the coming decade.

Manual Cycle Monitoring

Historically, manual cycle monitoring had been carried out in four of the seven Auckland region Territorial Authorities (TAs). However, each monitor had been undertaken using a different methodology[2]. This variability prevented the possibility of comparing the relative popularity of different sites across TA boundaries. In addition, each monitor programme took place at different times of the year, preventing comparability from location to location since factors such as weather, school/tertiary education holidays, seasonal variations and daylight savings each have an impact on the numbers of cyclists. Even within TAs, inconsistencies as to when counts took place from year to year prevented robust comparability over time.

Through the Regional Cycle Monitoring Plan, it was proposed that these manual counts be regionally aligned to ensure better regional consistency. Ideally, cycle count monitoring would be carried out at the same time each year across the region, applying a standard methodology.

[1] Auckland Regional Transport Authority (2006) *Regional Cycle Monitoring Plan (Provisional Guidelines)*

[2] For example, Manukau and North Shore cities' monitors took place at the same morning and evening peak times, while Auckland city's differs by one hour for the evening peak, and Waitakere's differs for both peaks.

As outlined in the Regional Cycle Monitoring Plan, a consistent methodology would ensure that:

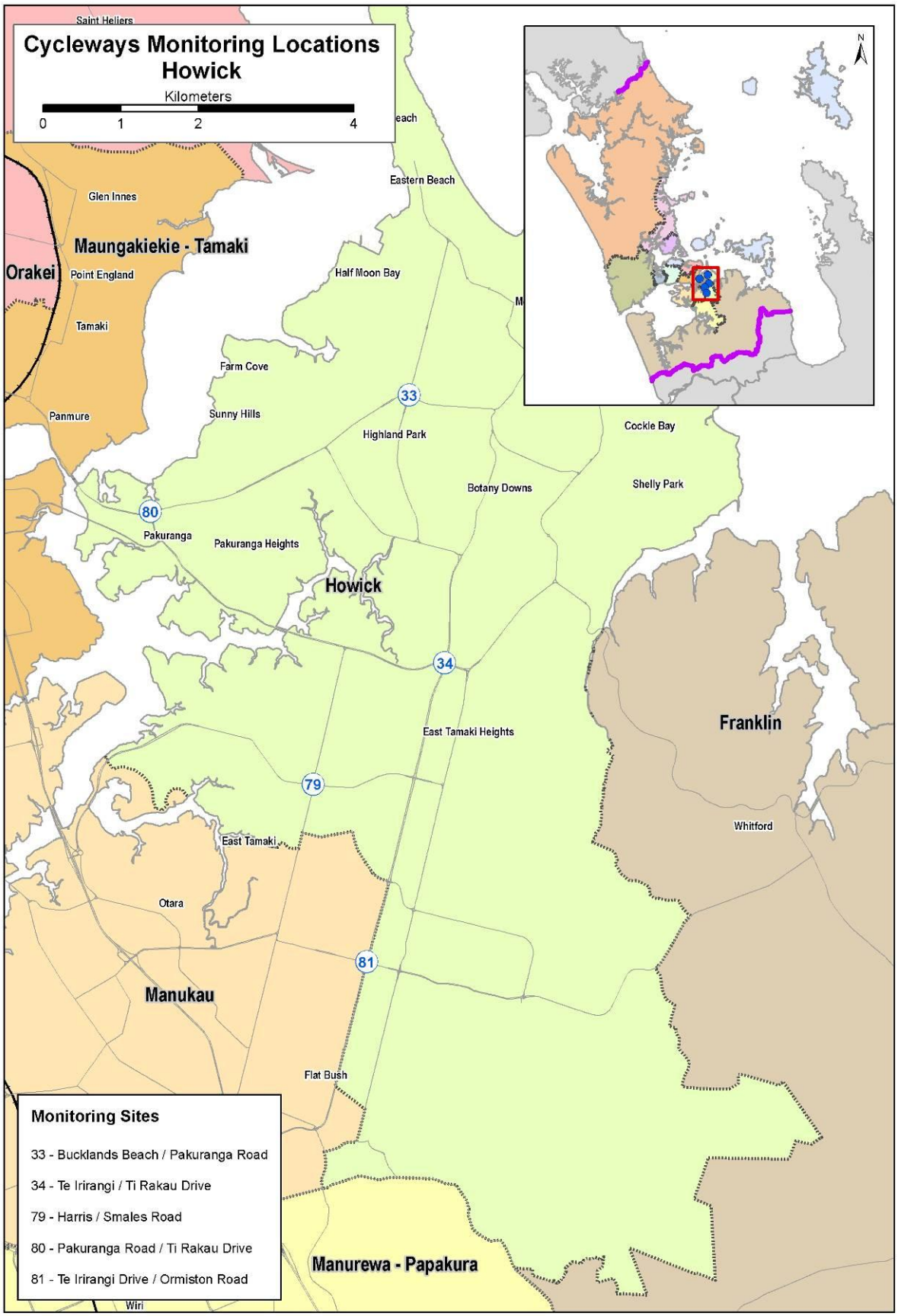
- standard monitoring days are used – that is, school and tertiary holidays, and statutory holidays are excluded and that monitoring preferably takes place at the same time each year to enable reliable year-on-year comparisons to be made. Decisions about whether cycle counts take place on weekdays and weekends would be made at the outset;
- a consistent set of times are used for monitoring, for the morning, evening and inter-peak periods; and
- a consistent method is used for monitoring direction and location of cyclists, including monitoring how many are on the footpath.

This report presents results from manual cycle counts conducted at two sites in the Howick ward following a standardised methodology. Results are presented site-by-site, as well as being aggregated to a ward and region level. For sites also monitored in 2007, 2008, 2009 and/or 2010, comparative results are provided.

Important Note: This report provides the results of manual cycle monitoring conducted at five pre-determined sites in the Howick ward only. Site-by-site results and ward summaries for all other Auckland region wards have been provided in separate documents. It is strongly recommended that this report be read in conjunction with the Regional Summary document, which provides aggregated data for the region, as well as a regional comparison of results.

Figure 1.1 shows the locations of the monitoring sites in the Howick ward. Note that one site (Te Irirangi Drive/Ormiston Road in Flat Bush – Site 81) lies on the border with the Manukau ward and consequently has been included in both ward reports.

Figure 1.1: 2011 Cycle Monitoring Locations in Howick Ward



1.2 Methodology

Manual cycle counts have been conducted using a standardised methodology across all sites. This methodology is outlined below.

Choice of Sites

Decisions as to which sites were chosen for cycle counts were guided by the planned developments for the Regional Cycle Network.

Manual counts were undertaken at 82 different sites throughout the region. Sites were distributed by ward as follows:

- Albany 15 sites
- Albert-Eden–Roskill 10 sites
- Franklin 2 sites
- Howick 5 sites
- Manukau 10 sites
- Manurewa-Papakura 4 sites
- Maungakiekie-Tamaki 7 sites
- North Shore 8 sites
- Orakei 2 sites
- Waitakere 13 sites
- Waitemata and Gulf 9 sites
- Whau 4 sites

(Note: Seven sites lie on the border of two wards. These sites have been included in both ward reports).

Monitoring Times

Time Of Day

Manual counts in the morning peak were conducted between 6:30 and 9:00 am, with manual counts in the evening peak conducted between 4:00pm and 7:00pm.

Day Of Week

Previous experience conducting cycle and other traffic manual counts has found that these counts are best undertaken on either a Tuesday, Wednesday or Thursday as travel patterns on Mondays and Fridays tend to be more variable.

Time Of Year

To ensure consistency throughout the region, standard monitoring days were selected and agreed upon by Auckland Transport. In selecting the days, consideration was given to:

- the timing of school and tertiary holidays/the commencement of term time for tertiary institutions;
- the timing of statutory holidays (particularly Easter);
- the timing of Bikewise Month; and
- daylight saving times.

It was agreed that manual counts would commence on Tuesday the 8th of March and be conducted on the first three fine days of the 8th, 9th, 10th, 15th, 16th, or 17th of March.

Counts were conducted on the following days:

• Tuesday 8th March	Albany, Manukau, Manurewa-Papakura, Franklin
• Wednesday 9th March	North Shore, Waitemata and Gulf, Whau, Albert-Eden-Roskill
• Thursday 10th March	Maungakiekie-Tamaki, Howick, Orakei, Waitakere

Note: Counts in the morning and evening peaks took place on the same day for each site.

Weather and Daylight Conditions

Auckland city's 2006 cycle monitor provides a clear example of the impact of weather conditions on the validity of the data collected. During the (fine) morning peak, 1579 cyclists were recorded across the twelve monitoring sites. By comparison, in the (wet) evening peak on the same day, only 1050 cyclists were counted, demonstrating that only 66% of those who cycled during the morning peak were counted again in the evening. Such a significant drop in cycle numbers was not observed in previous years, when weather was comparable in the morning and evening peak.

To reduce the impact of weather conditions on cycle numbers, manual counts were conducted on predominantly fine days. In addition, if it rained during the morning peak, monitoring in the evening peak on that same day was also postponed, irrespective of the weather (as it can be assumed that cyclists' travel behaviour in the evening peak will have been influenced by decisions they made earlier in the day – for example, the decision to leave their bike at home and use public transport instead). Care was taken to ensure that all manual counts were conducted prior to the conclusion of daylight saving.

The weather on the three count days in 2011 was as follows:

Tuesday 8th March

- Sunrise: 7:12am; Sunset: 7:51pm.
- Highest temperature: 20.1 degrees Celsius.
- Fine weather for all sites in both the morning and evening shifts.

Wednesday 9th March

- Sunrise: 7:13am; Sunset: 7:50pm.
- Highest temperature: 22.5 degrees Celsius.
- Fine weather for all sites in the morning shifts. In the evening shift, showers were observed at some sites from 6.00pm until the end of the monitoring period.

Thursday 10th March

- Sunrise: 7:14am; Sunset: 7:48pm.
- Highest temperature: 21.7 degrees Celsius.
- Fine weather for all sites in both the morning and evening shifts.

Conducting The Manual Counts

Scoping Visit

Gravitas visited each of the sites prior to the first monitoring shift. This scoping visit was used to map the roading network and to identify and map the range of directions that cyclists could travel through the site. This visit was also used to identify any particular features (such as designated cycle ways) or potential hazards that surveyors needed to be aware of when monitoring at the site. As part of the scoping visit, a recommended observation point was identified and mapped (this point chosen on the basis of offering the best trade-off between visibility and safety). The maps prepared for each site have been included in this report – just prior to the count results for each site.

As part of the scoping visit, a small number of sites were identified as requiring two or more surveyors to accurately capture all cycle movements (due predominantly to the complexity of the roading/cycleway network at the site or poor visibility at the intersection). Two surveyors were used at:

- Great South Road/Campbell Road/Main Highway, Greenlane (Site 21; Maungakiekie-Tamaki/Albert-Eden-Roskill wards).
- Beach Road/Browns Bay Road, Mairangi Bay (Site 45; Albany ward).

Three surveyors were used at the ferry terminal site (Site 22; Waitemata and Gulf ward).

Briefing Session

Prior to their monitoring shift, all surveyors participated in a briefing session. The session covered:

- the overall aims of the Regional Cycle Monitoring Plan and how the manual monitoring fits with this Plan;
- the aims and purpose of the cycle monitoring and the process to be used;
- review of all materials supplied – how to interpret and use the maps, how to accurately record data on count sheets etc;
- health and safety issues; and
- general administration – shift times, collection and return of materials etc.

This session was interactive, with surveyors being encouraged to ask questions and seek further explanation on issues they were unsure about. Surveyors were also provided with a copy of the briefing notes for reference during their shifts. During the briefing session, all surveyors were also required to conduct a "practice count" for 20 minutes at the Ponsonby Road/Karangahape Road site.

Conducting The Manual Counts

Each site was assigned to a surveyor, who was issued with a map that showed the range of movements a cyclist could make through that site. In addition to the map, surveyors were issued with a clipboard, a safety vest and a letter identifying them as a member of a Gravitas research team[3].

During their shift the surveyor collected data on:

- The total number of cyclists[4] passing through the intersection;
- The direction in which cyclists are travelling (using the numbers on the map provided);
- The time at which cyclists pass through the intersection (to the nearest minute);
- Whether cyclists are school children or adults (determined by whether they are wearing a school uniform or clearly of school age);
- Whether cyclists are wearing a helmet;
- Gender of the cyclist *(collected for the first time in 2011)*; and
- Whether cyclists are riding on the road, footpath or designated off- road cycleway[5].

[3] This letter also contained contact details for Auckland Transport and Gravitas Research and Strategy for any member of the public or local business owners who had queries about the work being undertaken.
[4] To ensure consistency across all surveyors, a "cycle" was defined as being non-motorised, with one or two wheels and requiring pedalling to make it move. Note that this definition did not include scooters.
[5] Note: For the purpose of this project, an off-road cycleway is defined as designated off-road path for cycles. This includes exclusive cycle paths, separated paths (such as the footpath on Tamaki Drive) and shared-use paths (available to cyclists and pedestrians). It excludes on-road cycle lanes (that is, designated lanes marked on the road).

Since 2009, surveyors have been required to indicate those cyclists riding together in groups of three or more. To be consistent with previous years, each member of these 'pelotons' has been included in the site-level analysis as a separate cyclist movement. However, where pelotons were observed, the number of cyclists and the time they passed through the site has been given in the report, along with a percentage figure indicating what share of all cyclists at the site were riding as groups.

In addition, where cyclists were recognisable, surveyors were instructed to record each cyclist no more than three times during a single shift, irrespective of how many movements they actually made through the site. Surveyors noted where and when this occurred.

Data was collected on the weather and daylight conditions at the site. Surveyors were also encouraged to record any information that may have affected cycle numbers or cycle movements at the site – for example, construction or maintenance works being conducted on the cycle way or road works at the intersection.

A team of supervisors checked that surveyors were in the correct position and recording data accurately.

Data Analysis

Upon their return to Gravitas, all count sheets were checked for completeness. The raw data was then entered into Excel for logic checking, analysis and graphing.

Annual Average Daily Traffic (AADT) Analysis

It is acknowledged that the number of cyclists using a site varies by time of day, day of the week and week of the year, and therefore it is not valid to simply multiply manual count data collected over a certain (relatively brief) period out to represent a full day, week or year. However, according to Land Transport New Zealand[6], Annual Average Daily Traffic (AADT) analysis can be used to estimate the average annual daily flow of cyclists from manual and automated cycle counts conducted at one point in time. The procedure involves deriving scale factors, which account for the time of day, day of the week, and week of the year (which varies with school holidays and season) as well as weather conditions on the count day. These scale factors are then applied to the count data collected to give an AADT estimate.

Using the manual count figures for each site, it has been possible to provide the average annual daily traffic flow of cyclists (cycling AADT) estimate for each site. AADT scale factors (morning and afternoon) were provided by ViaStrada[7].

[6] http://www.ltsa.govt.nz/road-user-safety/walking-and-cycling/cycle-network/appendix2.html
[7] ViaStrada is a traffic engineering and transport planning consultancy based in Christchurch, New Zealand.

By applying the scale factor to the manual count data for each morning and afternoon peak, and averaging the two figures, an average annual daily cyclist flow figure has been obtained for each site. *A more comprehensive overview of the methodology used for this analysis is provided in Appendix One.*

Note: ViaStrada acknowledge that, as cycling volumes fluctuate from day to day depending on the weather, this method should be used with caution. They note that ideally an estimate should be achieved based on the average of the results of several counts, rather than counts from a single day, as in this study[8].

School Bike Shed Counts

As stated above, manual cycle counts were undertaken during the morning (6:30am to 9:00am) and evening (4:00pm to 7:00pm) peaks. However, it was noted in the design phase of the project that the timing of the evening peak monitoring would mean that the greatest share of students cycling home from school will be excluded from the counts. This was identified as a potential weakness of the monitoring proposed.

Therefore, it was suggested that information on numbers of students cycling to and from intermediate and secondary schools across the region could be collected by counting the number of bikes in school bike sheds on a pre-determined day. Rates of cycling among students could also be assessed by calculating the number of bikes counted as a share of the school's total roll (or share of the school's roll eligible to cycle).

Initially it was decided that school bike shed monitoring would focus only on intermediate and secondary schools (and composite schools which included children of intermediate and secondary school age), since children travelling to primary schools are considered by many parents (and schools) as too young to cycle to school. Note however that, to ensure all children of intermediate school age cycling to school were captured, full primary schools (those catering for Years 1 to 8) were included in the school bike shed count from 2011.

[8] Appendix 2 of the Cycle Network and Route Planning Guide (CNRPG) (Land Transport New Zealand, 2004)

Methodology

The following process was used to collect the school bike shed count data.

1. Gravitas designed an information sheet that was distributed to most full primary, intermediate, secondary and composite (Years 1 to 13) schools in the Auckland region via email (note a small number of schools were omitted due to the special nature of the students e.g. boarding schools, special needs schools). This sheet was designed in consultation with Auckland Transport to ensure all necessary information was collected.

2. This email was then sent to all eligible schools in Auckland region (n=295) to notify them of the bike shed count and to let them know what they would be required to do. Included in this email was a link to an online count form.

3. To enhance the comparability of the school bike shed data with that of the regional cycle monitor, Tuesday 8th March was designated as the bike shed count day. (Most schools reported that they undertook the count on this day).

4. Once the school bike shed count had been completed, schools completed the online count form and submitted it electronically to Gravitas. Gravitas contacted all participating schools who had not returned their sheets after five working days, first by email (two rounds) and then by telephone. All count forms were checked for completeness before being data-entered into Excel. In 2011, 201 responses were received, a response rate of 68 per cent.

Reporting

The data from the manual counts has been presented at a site-by-site, TA and regional level.

Manual Counts - Site Level Reporting

The following results have been reported for each site:

- Total number of movements through the intersection during each peak;
- Total number of movements through the intersection during each ten-minute interval during each peak;
- Number of cyclists making each directional movement through the intersection during each peak; and
- Share of cyclists through the intersection during each peak who are:
  - adults/school children
  - wearing a helmet/not wearing a helmet
  - male/female
  - riding on the road/riding on the footpath/riding on an off-road path

Manual Counts - Aggregated Reporting

Results have also been reported at an aggregate level (that is, summing up all sites) – by ward and across the region – to show the total number of cycle movements recorded (both overall and by ten-minute intervals) and the characteristics of the cyclists.

Bike Shed Counts

Results have been provided by school (along with notes explaining why counts for some schools may not be representative), as well as at a ward and regional level. Raw cycle numbers and a "cyclists as a share of total school roll" figure have both been provided.

1.3 Summary of Results

This summary contains the aggregated results of the five sites surveyed in the Howick ward. It is split into four sections – a summary of results for the morning peak period (6:30am to 9:00am), a summary for the evening peak period (4:00pm to 7:00pm), a summary of aggregated results (morning and evening combined) and a summary of the results from the school bike shed counts.

While the summaries in this section are useful in giving an overall picture of cycling behaviour in the Howick ward, they hide much of the specific details of cycling behaviour at individual sites. The site-specific data varies significantly from site to site, and can be found in Sections Two and Six of this report.

Note: Surveying in the Howick ward was undertaken on Thursday 10th of March, 2011[9]. Sunrise was at 7:14am and sunset at 7:48pm. The highest temperature was 21.7 degrees Celsius.

[9] The only exception was Te Irirangi/Ormiston Road in Flat Bush which was monitored on Tuesday the 8th of March, along with the other sites in the Manukau ward.

1.4 Morning Peak

Environmental Conditions

- All sites had fine weather in the morning.
- There were no road works or accidents that may affect cycle counts in the morning.

Key Points

- Across the five sites monitored in the Howick ward, the number of cyclist movements has remained stable (198 in 2011, compared with 195 in 2010).
- The average volume of morning cyclists across the five sites monitored is 40 cycle movements (stable from 39 cycle movements in 2010).
- The busiest site in the morning peak is the intersection of Ti Rakau Drive and Pakuranga Road (59 movements, down from 70 movements last year), whereas the site at Te Irirangi Drive/Ormiston Road has the lowest level of morning cyclist traffic (24 cycle movements).
- Two sites recorded increases this year compared to 2010. These increases are at:
  - Harris/Smales Road – up 40 per cent; and
  - Te Irirangi/Ti Rakau Drive – up 23 per cent.
- The remaining three sites recorded declines, the most notable at Pakuranga Road/Te Rakau Drive – down 16 per cent.

Table 1.1: Summary Of Morning Cyclist Movements 2007-2011 (n)

Site Number	*Locations*	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11	Change 07-11
33	Bucklands Beach/Pakuranga Road	68	53	51	45	**43**	-4%	-37%
34	Te Irirangi Drive/Ti Rakau Drive	36	36	30	30	**37**	23%	3%
	Average per site (for 2 sites since 2007)	**52**	**45**	**41**	**37**	**40**	**8%**	**-23%**
	Total (for 2 sites since 2007)	**104**	**89**	**81**	**75**	**80**	**7%**	**-23%**
80	Pakuranga Road/Ti Rakau Drive	-	-	46	70	**59**	-16%	-
79	Harris/Smales Road	-	-	35	25	**35**	40%	-
81	Te Irirangi Drive/Ormiston Road	-	-	13	25	**24**	-4%	
	Average per site (all sites)	**-**	**-**	**35**	**39**	**40**	**3%**	-
	Total (all sites)	**-**	**-**	**175**	**195**	**198**	**2%**	-

- As shown in Table 1.2 below, morning cyclist characteristics this year are very similar to those reported in 2010. The majority of morning cyclists are adults (84 per cent, stable from 85 per cent last year).
- The majority of cyclists are wearing a helmet (95 per cent, stable from 93 per cent recorded in 2010).
- The majority of morning cyclists are males (89 per cent).
- Approximately two in three cyclists are riding on the road (63 per cent, down from 68 per cent in 2010).

Table 1.2: Summary of Morning Cyclist Characteristics

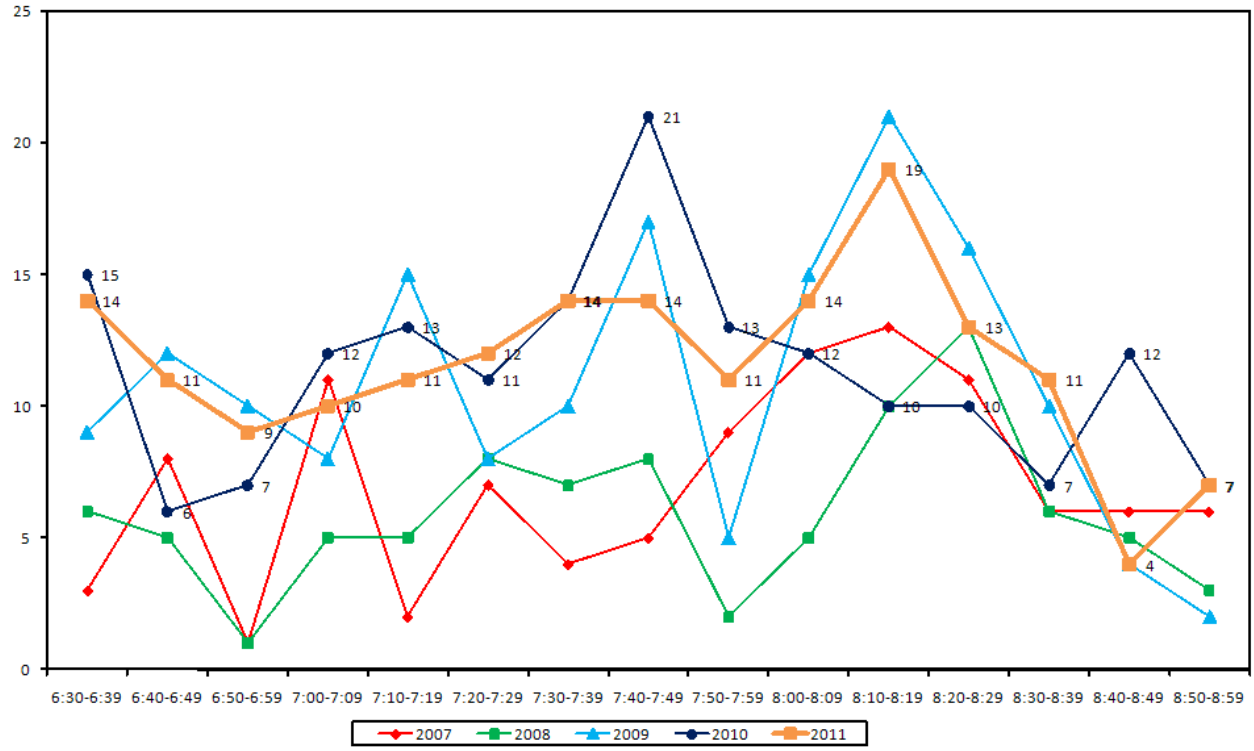
2007-2011 (%)

	2007	***2008***	***2009***	***2010***	***2011***	**Change 10-11**
Cyclist Type						
Adult	62	73	76	85	84	-1
School child	38	27	24	15	16	1
Helmet Wearing						
Helmet on head	80	92	90	93	95	2
No helmet	20	8	10	7	5	-2
Gender						
Male	-	-	-	-	89	-
Female	-	-	-	-	7	-
Can't tell	-	-	-	-	4	-
Where Riding						
Road	42	65	58	68	63	-5
Footpath	58	35	42	32	37	5
Base:	***104***	***89***	***175***	***195***	***198***	

- Figure 1.2 illustrates the total number of cyclists in the morning peak by time of movement. In 2011, morning cycle numbers were steady throughout the morning monitoring period, peaking between 8:10am and 8:19am (19 movements). This compares with a peak of 21 movements between 7:40am and 7:49am in 2010.

Figure 1.2: Total Cyclist Frequency – Morning Peak

2007-2011 (n)



1.5 Evening Peak

Environmental Conditions

- All sites had fine weather in the morning.
- There were no road works or accidents at most sites during the evening monitoring period.

Key Points

- Across the five sites monitored in the Howick ward, the number of cycle movements has decreased, from 287 movements in 2010 to 240 movements in 2011, a decline of 16 per cent.
- The average volume of evening cyclists across all five sites is 48 (down from 57 movements last year).
- Nine percent of all evening peak cyclists (n=21) were riding together in groups.
- The Pakuranga Road/Ti Rakau Drive intersection continues to be the busiest in terms of the evening cyclists' activity (65 cycle movements, down notably from 92 movements last year). The intersection of Te Irirangi Drive/Ormiston Road has the lowest level of evening cyclist traffic (32 cycle movements).
- Just one site recorded an increase this year compared to 2010 - Harris/Smales Road, up 8 per cent.
- In contrast, the four remaining sites in the Howick ward recorded declines, the most notable being Pakuranga Road/Ti Rakau Drive – down 29 per cent.

Table 1.3: Summary Of Evening Cyclist Movements

2007-2011 (n)

Site Number	*Locations*	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11	Change 07-11
33	Bucklands Beach/Pakuranga Road	72	77	43	69	**64**	**-7%**	-11%
34	Te Irirangi Drive/Ti Rakau Drive	45	39	29	48	**39**	**-19%**	-13%
	Average per site (for 2 sites since 2007)	**59**	**58**	**36**	**59**	**52**	**-12%**	-12%
	Total (for 2 sites since 2007)	**117**	**116**	**72**	**117**	**103**	**-12%**	-12%
80	Pakuranga Road/Ti Rakau Drive	-	-	77	92	**65**	**-29%**	-
79	Harris/Smales Road	-	-	25	37	**40**	**8%**	-
81	Te Irirangi Drive/Ormiston Road	-	-	20	41	**32**	**-22%**	-
	Average per site (all sites)	**-**	**-**	**39**	**57**	**48**	**-16%**	-
	Total (all sites)	**-**	**-**	**194**	**287**	**240**	**-16%**	-

- Evening cyclist characteristics this year show that the majority of evening cyclists in this ward are adults (89 per cent, up slightly from 85 per cent last year).
- More than four in five cyclists are wearing a helmet (89 per cent, stable from 90 per cent in 2010).
- Almost all evening peak cyclists are male (90 per cent).
- On average, two in three evening cyclists are riding on the road (65 per cent, down from 72 per cent last year).

Table 1.4: Summary of Evening Cyclist Characteristics

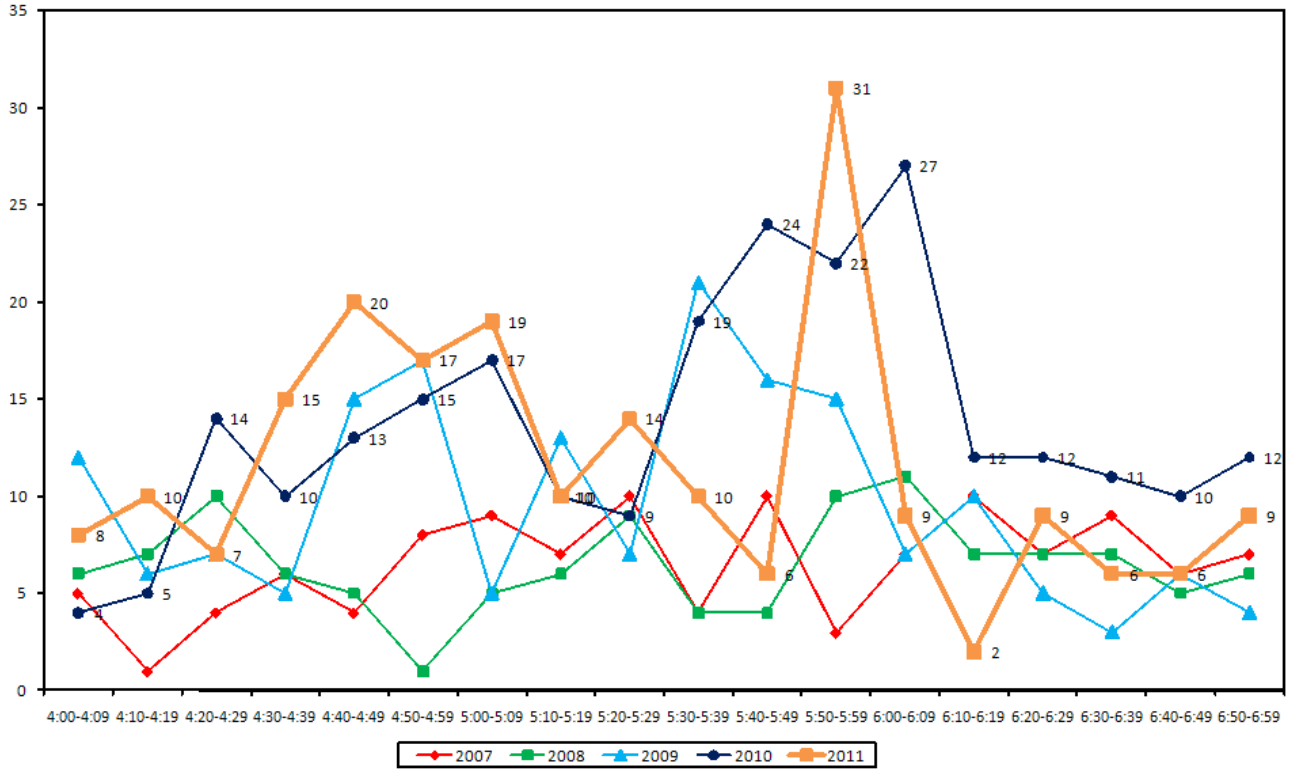
2007-2011 (%)

	2007	***2008***	***2009***	***2010***	***2011***	**Change 10-11**
Cyclist Type						
Adult	84	75	93	85	89	4
School child	16	25	7	15	11	-4
Helmet Wearing						
Helmet on head	75	79	89	90	89	-1
No helmet	25	21	11	10	11	1
Gender						
Male	-	-	-	-	90	-
Female	-	-	-	-	5	-
Can't tell	-	-	-	-	5	-
Where Riding						
Road	46	54	65	72	65	-7
Footpath	54	46	35	28	35	7
Base:	***117***	***116***	***194***	***287***	***240***	

- The overall pattern of cyclist volumes by time of movement in the evening is illustrated in Figure 1.3. Evening cyclist volumes fluctuate throughout the monitoring period, with the peak occurring between 5:50pm and 5:59pm (31 movements).

Figure 1.3: Total Cyclist Frequency – Evening Peak

2007-2011 (n)



1.6 Aggregate Total

- A total of 463 cyclist movements were recorded across the five sites in 2011 (down from 511 movements in 2010).
- The busiest site is the intersection of Pakuranga Road and Ti Rakau Drive with a total of 124 movements (down from 162 movements in 2010), while Te Irirangi Drive/Ormiston Road has the lowest number of cyclist volumes (56 movements, down from 66 movements last year).
- The only site that recorded an increase this year is Harris/Smales Road (up 21 per cent from 2010).
- The four remaining sites have recorded decreases in total cyclist numbers this year compared with 2010, the most notable being Pakuranga Road/Ti Rakau Drive (down 23 per cent).

Table 1.5: Summary Of Total Cyclist Movements

2007-2011 (n)

Site Number	*Locations*	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11	Change 07-11
33	Bucklands Beach/Pakuranga Road	140	130	94	114	**107**	**-6%**	-24%
34	Te Irirangi Drive/Ti Rakau Drive	81	75	59	78	**76**	**-3%**	-6%
	Average per site (for 2 sites since 2007)	**111**	**103**	**77**	**96**	**92**	**-4%**	-17%
	Total (for 2 sites since 2007)	**221**	**205**	**153**	**192**	**183**	**-5%**	-17%
80	Pakuranga Road/Ti Rakau Drive	-	-	123	162	**124**	**-23%**	-
79	Harris/Smales Road	-	-	60	62	**75**	**21%**	-
81	Te Irirangi Drive/Ormiston Road	-	-	33	66	**56**	**-15%**	-
	Average per site (all sites)	-	-	**74**	**96**	**88**	**-9%**	-
	Total (all sites)	**-**	**-**	**369**	**482**	**438**	**-9%**	-

- Overall cyclist characteristics are illustrated in Table 1.6. In total, 86 per cent of cyclists are adults (stable from 85 per cent in 2010).
- Most cyclists are wearing a helmet (91 per cent, stable from last year).
- Almost all cyclists are male (89 per cent).
- On average, about two in three cyclists are riding on the road (64 per cent, down from 70 per cent in 2010).

Table 1.6: Summary of Total Cyclist Characteristics

2007-2011 (%)

	2007	*2008*	*2009*	*2010*	*2011*	Change 10-11
Cyclist Type						
Adult	74	74	85	85	86	1
School child	26	26	15	15	14	-1
Helmet Wearing						
Helmet on head	77	85	89	91	91	0
No helmet	23	15	11	9	9	0
Gender						
Male	-	-	-	-	89	-
Female	-	-	-	-	6	-
Can't tell	-	-	-	-	5	-
Where Riding						
Road	44	59	62	70	64	-6
Footpath	56	41	38	30	36	6
Base:	***221***	***205***	***369***	***482***	***438***	

1.7 Average Annual Daily Traffic (AADT) Estimate

AADT Estimate

- Table 1.7 provides the comparative AADT estimates for each site, based on the average of morning and evening peak AADT calculations.
- The highest AADT is at Pakuranga Road/Ti Rakau Drive (180 daily movements) and the lowest is at Te Irirangi Drive/Ormiston Road (81 daily movements).
- The only site that recorded an increase this year is Harris/Smales Road (up 22 per cent from 2010).
- The four remaining sites have recorded decreases in AADT counts this year compared with 2010, the most notable being Pakuranga Road/Ti Rakau Drive (down 23 per cent).

Table 1.7: AADT Estimates Based on Morning and Evening Cyclist Movements

2007-2011 (n)

Site Number	*Locations*	*2007 AADT*	*2008 AADT*	*2009 AADT*	*2010 AADT*	*2011 AADT*	Change 10-11	Change 07-11
80	Pakuranga Road/Ti Rakau Drive	-	-	176	234	**180**	**-23%**	-
33	Bucklands Beach/Pakuranga Road	203	187	137	164	**154**	**-6%**	-24%
34	Te Irirangi Drive/Ti Rakau Drive	117	109	86	112	**110**	**-2%**	-6%
79	Harris/Smales Road	-	-	88	89	**109**	**22%**	-
81	Te Irirangi Drive/Ormiston Road	-	-	47	95	**81**	**-15%**	-

1.8 Ferry Wharf Bike Count Summary

Key Points

- In the morning, no cycles were observed at the Half Moon Bay Ferry Wharf at either 6.10am or 9.10am.
- In the afternoon, no cycles were recorded at the Half Moon Bay Ferry Wharf at 3.30pm while one cycle was observed at 7.10pm.

1.9 School Bike Shed Count Summary

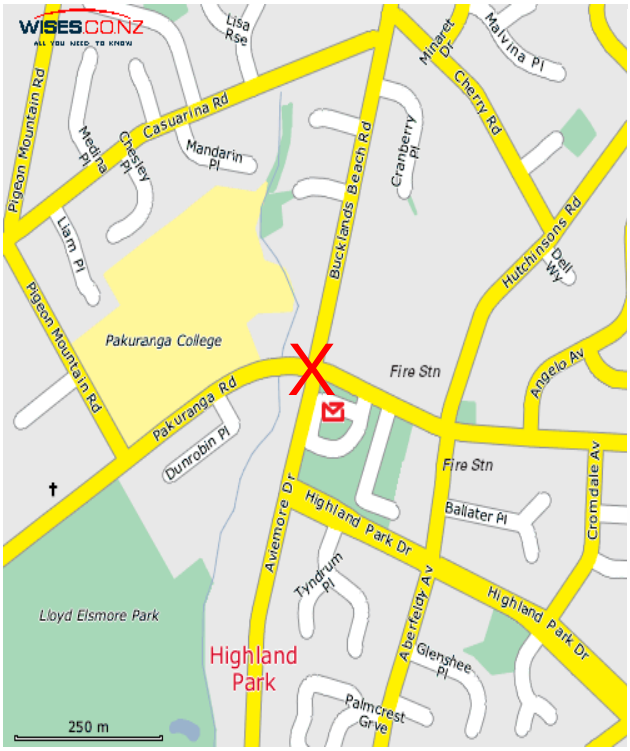
Key Points

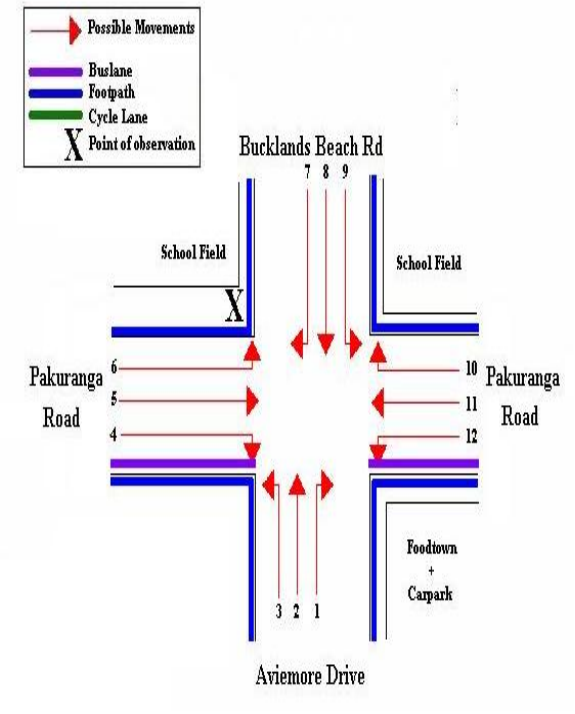
- Among the surveyed schools, of those eligible to cycle, on average, one per cent of students are cycling to their schools.
- Across the 10 schools that responded, 134 students were reported to cycle to school.
- This year, Farm Cove Intermediate reported the highest share of cyclists – 7 per cent of all eligible students currently cycling. This is stable from 7 per cent in 2010.
- Of the 10 schools that responded, one had no students cycling to school.
- Rates of cycling to school are highest among intermediate schools (3 per cent, down from 6 per cent last year).

2. BUCKLANDS BEACH ROAD/PAKURANGA ROAD, PAKURANGA (SITE 33)

Figure 2.1 shows the possible cyclist movements at this intersection.

Figure 2.1: Cycle Movements: Bucklands Beach/Pakuranga Road





2.1 Site Summary

	Raw Counts			AADT
	Morning Peak	*Evening Peak*	*Total*	*Total*
2007	68	72	140	203
2008	53	77	130	187
2009	51	43	94	137
2010	45	69	114	164
2011	**43**	**64**	**107**	**154**

2.2 Morning Peak

Environmental Conditions

- The weather was fine throughout the morning shift.
- There were no road works or accidents that may affect cycle counts.

Key Points

- A total of 43 cyclist movements were recorded, down slightly from 45 movements in 2010.
- The most common morning movement is straight along Pakuranga Road heading west (Movement 11 = 13 movements, an increase from 9 movements in 2010).
- The most notable changes are reported at Movement 5 (down 5 movements) and Movement 8 (up 5 movements).

Table 2.1: Morning Cyclist Movements

Bucklands Beach/Pakuranga Road 2007-2011 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11
1	0	0	0	0	1	**1**
2	7	6	3	3	3	**0**
3	15	8	12	6	4	**-2**
4	1	0	2	4	1	**-3**
5	3	3	6	7	2	**-5**
6	2	3	2	2	2	**0**
7	5	3	2	4	6	**2**
8	5	8	9	3	8	**5**
9	5	3	1	2	1	**-1**
10	2	2	0	4	2	**-2**
11	22	16	14	9	13	**4**
12	1	1	0	1	0	**-1**
Total	**68**	**53**	**51**	**45**	**43**	**-2**

- The proportion of all cyclists who are adults has decreased slightly since last year (60 per cent, down from 62 per cent in 2010).
- The majority of the cyclists were male (86 per cent).
- Most cyclists are wearing a helmet (88 per cent, stable from 87 per cent in the previous year).
- The incidence of cyclists riding on the footpath has decreased from 2010 (56 per cent, down from 64 per cent).

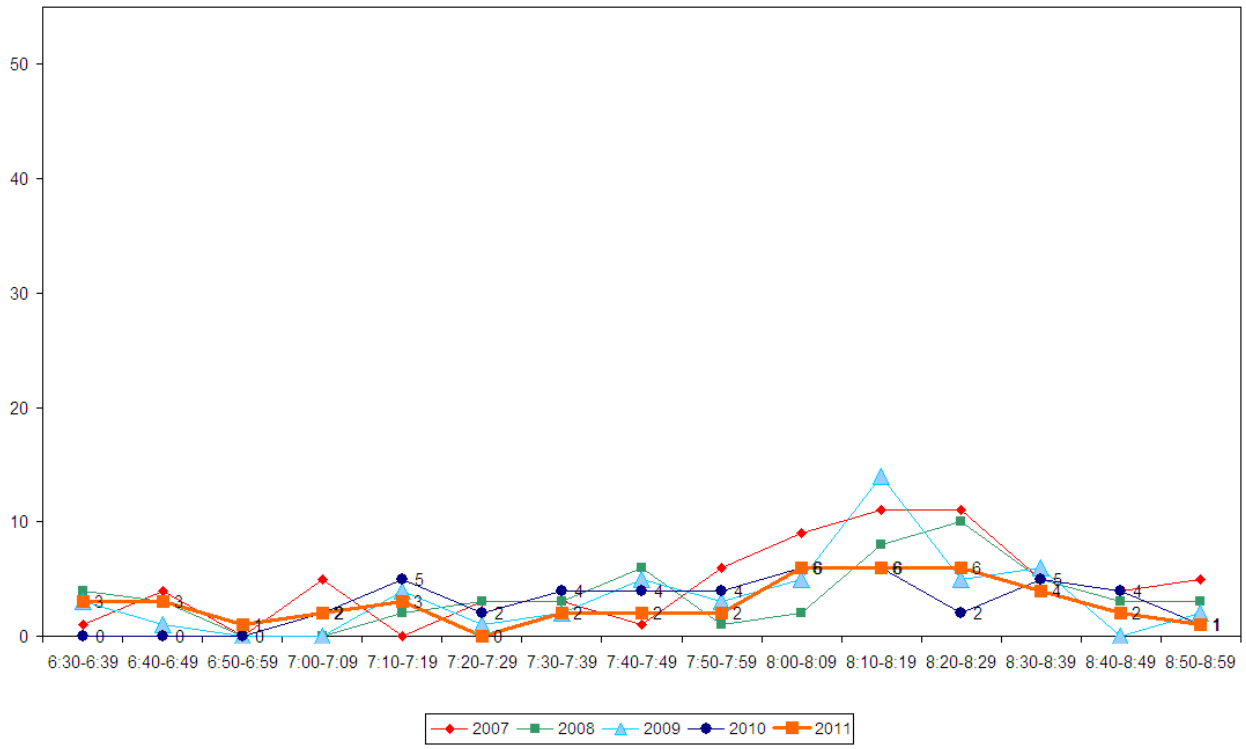
Table 2.2: Morning Cyclist Characteristics

Bucklands Beach/Pakuranga Road 2007-2011 (%)

	2007	*2008*	*2009*	*2010*	*2011*	Change 10-11
Cyclist Type						
Adult	43	58	45	62	60	**-2**
School child	57	42	55	38	40	**2**
Helmet Wearing						
Helmet on head	75	91	90	87	88	**1**
No helmet	25	9	10	13	12	**-1**
Gender						
Male	-	-	-	-	86	**-**
Female	-	-	-	-	5	**-**
Can't tell	-	-	-	-	9	**-**
Where Riding						
Road	24	47	39	36	44	**8**
Footpath	76	53	61	64	56	**-8**
Base:	***68***	***53***	***51***	***45***	***43***	

- This year, the volume of morning cyclist movements slightly peaks between 8:00am and 8:29am (6 movements per ten minute interval) but otherwise remains fairly stable and consistent with previous observations.

Figure 2.2: Morning Peak Cyclist Frequency
Bucklands Beach/Pakuranga Road (n)



2.3 Evening Peak

Environmental Conditions

- The weather was fine throughout the morning shift.
- There were no road works or accidents that may affect cycle counts.

Key Points

- A total of 64 cycle movements were recorded, down slightly from 69 movements last year.
- The most common movement in the evening is straight along Pakuranga Road heading east (Movement 5 = 14 movements) and straight on Bucklands Beach Road, heading south to Aviemore Drive (Movement 8 = 14 movements).
- Across the twelve movements possible at this intersection, the most notable change has been at Movement 11 (down 10 movements).

Table 2.3: Evening Cyclist Movements

Bucklands Beach/Pakuranga Road 2007-2011 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11
1	0	1	0	0	0	**0**
2	4	7	11	9	10	**-1**
3	4	8	2	1	3	**2**
4	11	10	4	6	1	**-5**
5	10	9	7	11	14	**3**
6	7	6	2	7	2	**-5**
7	11	9	5	2	3	**1**
8	7	7	6	12	14	**2**
9	4	4	1	6	7	**1**
10	4	8	0	0	5	**5**
11	10	6	4	14	4	**-10**
12	0	2	1	1	1	**0**
Total	**72**	**77**	**43**	**69**	**64**	**-5**

- Adult cyclists comprise the greatest share of cycle movements (75 per cent, up slightly from 70 per cent in 2010).
- Most cyclists at this site are wearing a helmet (83 per cent, up slightly from 81 per cent last year).
- The majority of cyclists are male (86 per cent).
- Compared with last year, the share of cyclists riding on the footpath has increased (up from 36 per cent in 2010 to 42 per cent this year).

Table 2.4: Evening Cyclist Characteristics

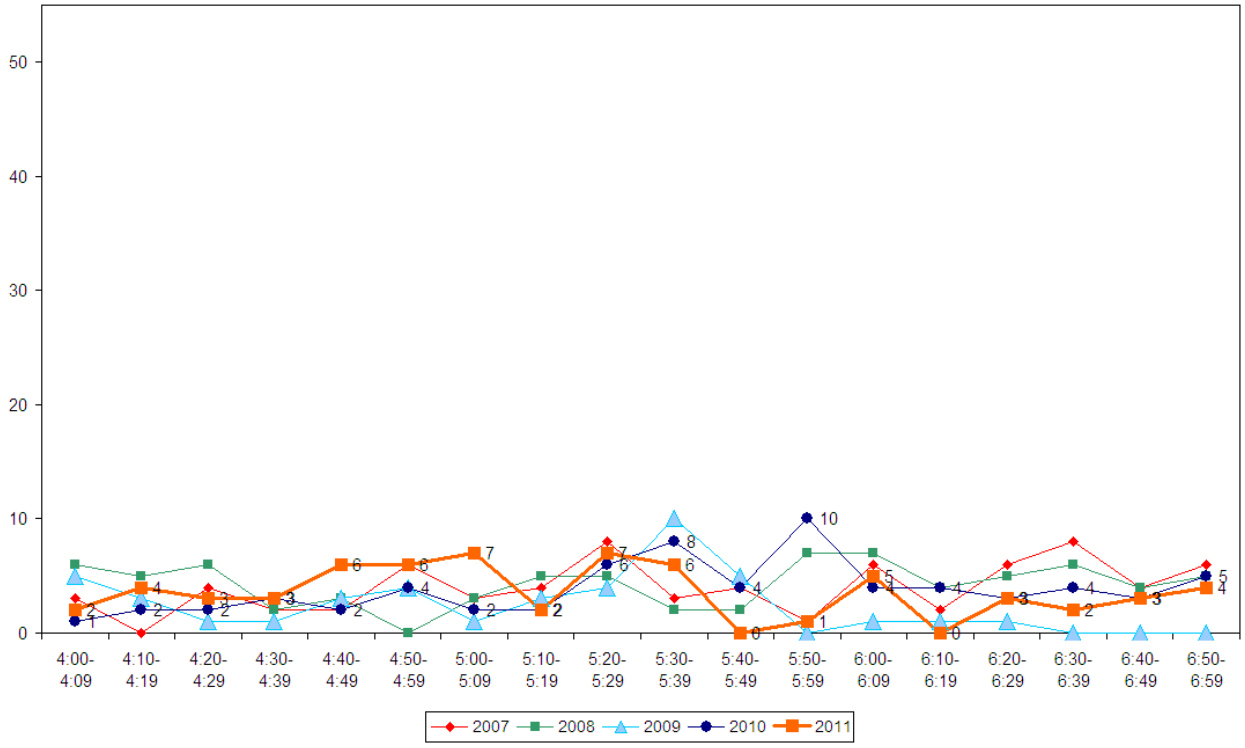
Bucklands Beach/Pakuranga Road 2007-2011 (%)

	2007	*2008*	*2009*	*2010*	*2011*	Change 10-11
Cyclist Type						
Adult	76	65	91	70	75	**5**
School child	24	35	9	30	25	**-5**
Helmet Wearing						
Helmet on head	68	77	86	81	83	**2**
No helmet	32	23	14	19	17	**-2**
Gender						
Male	-	-	-	-	88	**-**
Female	-	-	-	-	3	**-**
Can't tell	-	-	-	-	9	**-**
Where Riding						
Road	38	44	53	64	58	**-6**
Footpath	62	56	47	36	42	**6**
Base:	***72***	***77***	***43***	***69***	***64***	

- This year, the number of cyclist movements remains fairly stable over time with the greatest peaks between 4:40pm and 5:09pm (up to 7 movements per 10 minute interval), 5:20pm and 5:39pm (up to 7 movements per 10 minute interval) and again, a slight increase of cyclist movements between 6:00pm and 6:09pm (5 movements).

Figure 2.3: Evening Peak Cyclist Frequency

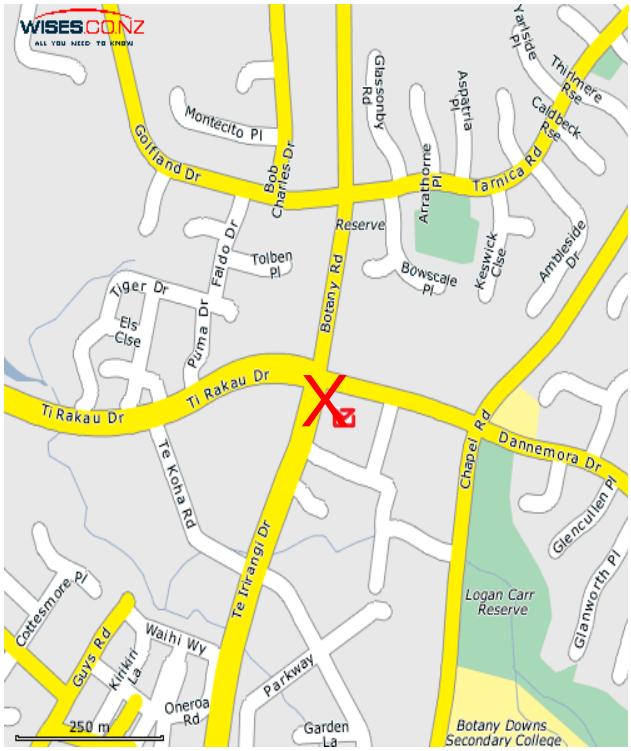
Bucklands Beach/Pakuranga Road (n)

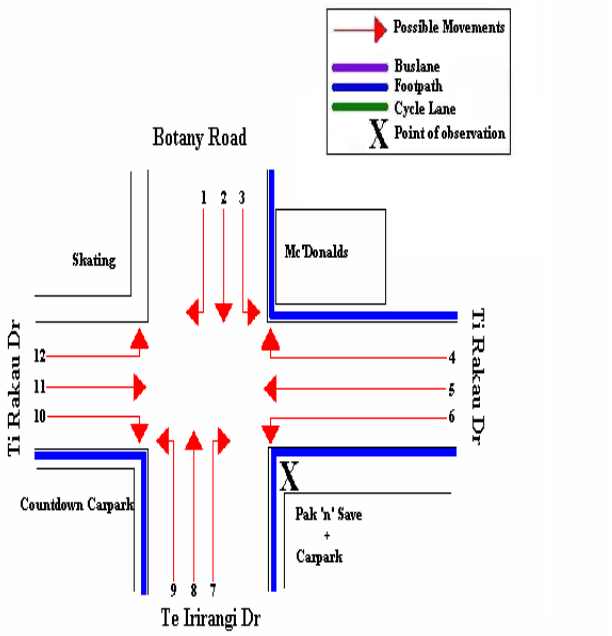


3. TE IRIRANGI DRIVE/TI RAKAU DRIVE, BOTANY DOWNS (SITE 34)

Figure 3.1 shows the possible cyclist movements at this intersection.

Figure 3.1: Cycle Movements: Te Irirangi /Ti Rakau Drive





3.1 Site Summary

	Raw Counts			AADT
	Morning Peak	*Evening Peak*	*Total*	*Total*
2007	36	45	81	117
2008	36	39	75	109
2009	30	29	59	86
2010	30	48	78	112
2011	**37**	**39**	**76**	**110**

3.2 Morning Peak

Environmental Conditions

- The weather was fine throughout the morning shift,
- There were no road works or accidents that may affect cycle counts.

Key Points

- The number of cyclist movements recorded at the Te Irirangi/Ti Rakau Drive intersection has increased from 30 movements in 2010 to 37 movements in 2011.
- The key movement in the morning is straight along Botany Road heading south (Movement 2 = 14 movements).
- Morning cyclist movement volumes are mostly stable from last year, with the greatest changes occurring at Movement 1 (up 3 movements) and Movement 10 (down 3 movements).

Table 3.1: Morning Cyclist Movements

Te Irirangi /Ti Rakau Drive 2007-2011 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11
1	13	10	6	4	7	**3**
2	8	12	13	12	14	**2**
3	1	0	2	1	0	**-1**
4	0	0	0	0	1	**1**
5	6	6	4	4	4	**0**
6	1	0	0	0	2	**2**
7	1	0	0	1	1	**0**
8	4	3	2	1	3	**2**
9	1	1	0	0	1	**1**
10	1	1	0	5	2	**-3**
11	0	2	3	1	1	**0**
12	0	1	0	1	1	**0**
Total	**36**	**36**	**30**	**30**	**37**	**7**

- Over the morning peak, most cyclists are adults (89 per cent, up slightly from 87 per cent last year).
- Almost all cyclists are wearing a helmet (97 per cent, down slightly from 100 per cent last year).
- The majority of cyclists are male (86 per cent).
- The percentage of cyclists riding on the road has decreased notably in comparison to last year (down to 68 per cent from 83 per cent in 2010).

Table 3.2: Morning Cyclist Characteristics

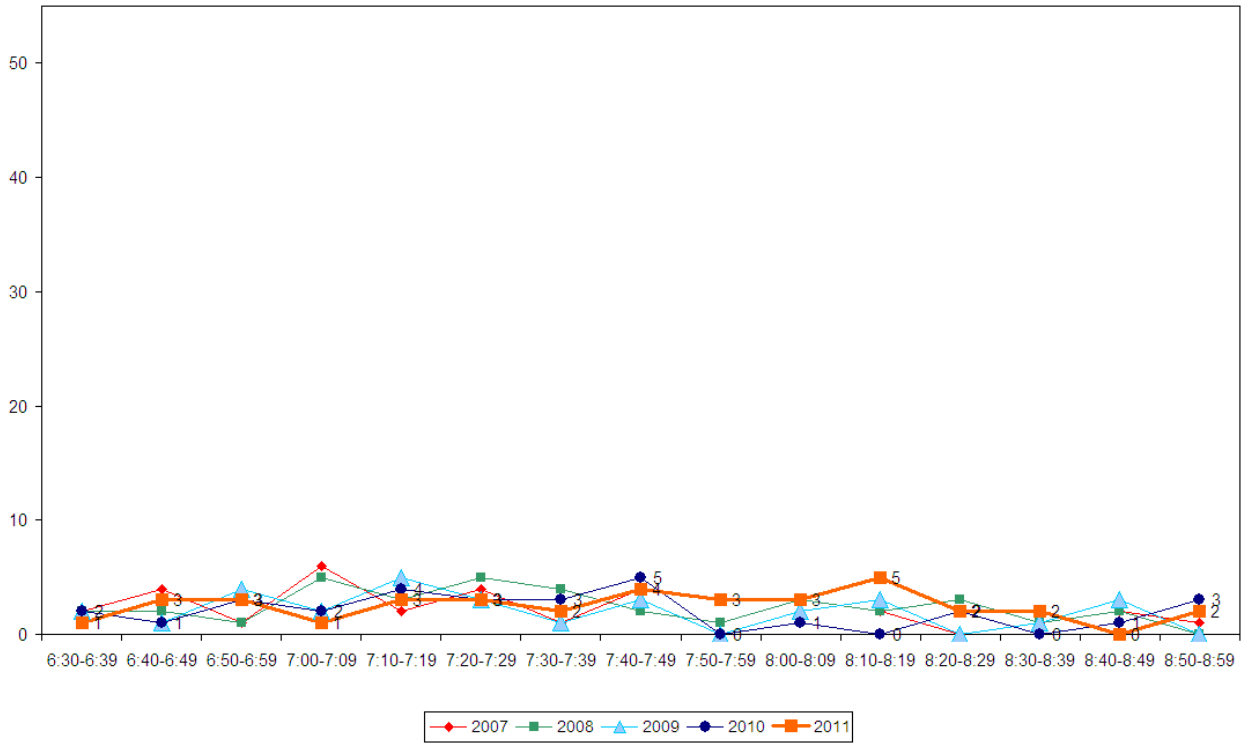
Te Irirangi /Ti Rakau Drive 2007-2011 (%)

	2007	***2008***	***2009***	***2010***	***2011***	**Change 10-11**
Cyclist Type						
Adult	97	94	93	87	89	**2**
School child	3	6	7	13	11	**-2**
Helmet Wearing						
Helmet on head	89	94	90	100	97	**-3**
No helmet	11	6	10	0	3	**3**
Gender						
Male	-	-	-	-	86	**-**
Female	-	-	-	-	14	**-**
Can't tell	-	-	-	-	0	**-**
Where Riding						
Road	58	75	70	83	68	**-15**
Footpath	42	25	30	17	32	**15**
Base:	***36***	***36***	***30***	***30***	***37***	

- This year, the greatest number of cycle movements occurred between 8:10am and 8:19am (5 movements) – later than the 7:40am and 7:49am peak recorded in 2010.

Figure 3.2: Morning Peak Cyclist Frequency

Te Irirangi /Ti Rakau Drive (n)



3.3 Evening Peak

Environmental Conditions

- The weather was fine throughout the evening shift,
- There were no road works or accidents that may affect cycle counts.

Key Points

- Compared with last year, the total number of evening cyclist movements observed at the Te Irirangi/Ti Rakau Drive intersection has decreased, from 48 movements in 2010 to 39 movements in 2011.
- The most common evening movement is straight along Ti Rakau Drive heading east (Movement 11 = 12 movements).
- Movement 1 saw the greatest change in cyclist movements when compared to last year's counts, decreasing by 7 movements.

Table 3.3: Evening Cyclist Movements

Te Irirangi /Ti Rakau Drive 2007-2011 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11
1	3	1	0	9	2	**-7**
2	11	3	4	2	5	**3**
3	3	0	0	1	4	**3**
4	5	1	0	2	0	**-2**
5	0	4	7	5	6	**1**
6	0	0	0	0	0	**0**
7	1	2	0	2	6	**4**
8	11	16	5	6	1	**-5**
9	0	0	0	1	0	**-1**
10	4	0	6	3	2	**-1**
11	3	7	5	10	12	**2**
12	4	5	2	7	1	**-6**
Total	**45**	**39**	**29**	**48**	**39**	**-9**

- Consistent with the morning peak, the greatest share of cyclists using this intersection continue to be adults, with the evening share of adult cyclists increasing notably from last year (95 per cent, compared with 81 per cent in 2010).
- Almost all cyclists at this site are wearing a helmet (97 per cent, up slightly from 94 per cent in 2010).
- The majority of cyclists are male (92 per cent).
- Consistent with 2010, just over two-thirds of cyclists are riding on the road (69 per cent).

Table 3.4: Evening Cyclist Characteristics

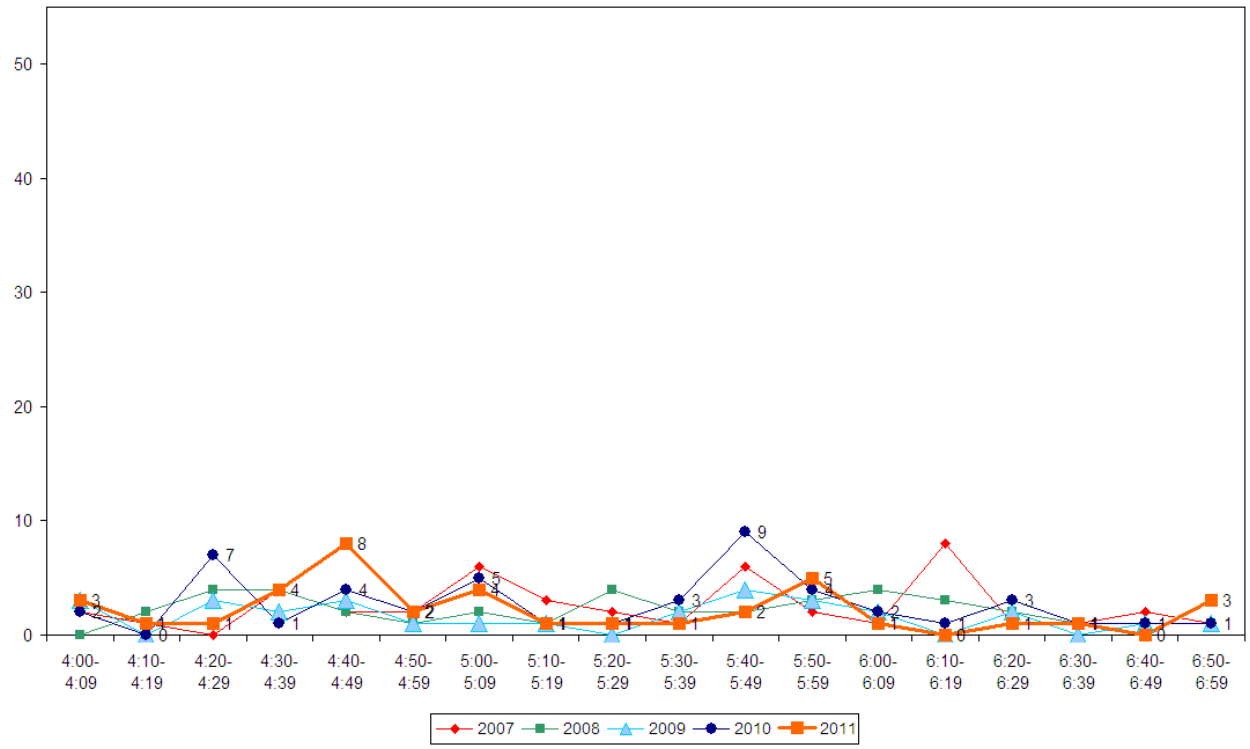
Te Irirangi /Ti Rakau Drive 2007-2011 (%)

	2007	*2008*	*2009*	*2010*	*2011*	Change 10-11
Cyclist Type						
Adult	98	95	90	81	95	**14**
School child	2	5	10	19	5	**-14**
Helmet Wearing						
Helmet on head	87	82	97	94	97	**3**
No helmet	13	18	3	6	3	**-3**
Gender						
Male	-	-	-	-	92	**-**
Female	-	-	-	-	8	**-**
Can't tell	-	-	-	-	0	**-**
Where Riding						
Road	58	59	59	69	69	**0**
Footpath	42	41	41	31	31	**0**
Base:	***45***	***39***	***29***	***48***	***39***	

- The volume of cyclist movements peaks twice - between 4:40 and 4:49pm (8 movements) and between 5:50 and 5:59pm (5 movements). Both peaks occur later than the 4:20pm-4:29pm and 5:40pm-5:49pm peaks seen in 2010.

Figure 3.3: Evening Peak Cyclist Frequency

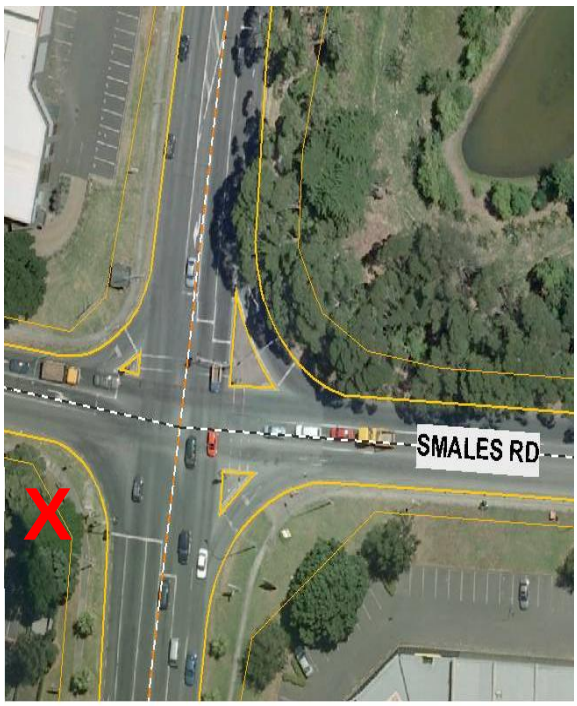
Te Irirangi/Ti Rakau Drive (n)

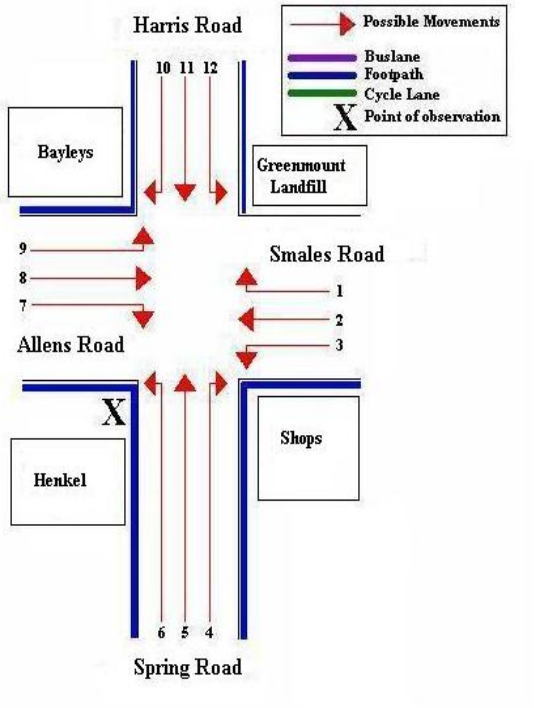


4. HARRIS/SMALES ROAD, EAST TAMAKI (SITE 79)

Figure 4.1 shows the possible cyclist movements at this intersection.

Figure 4.1: Cycle Movements: Harris/Smales Road





4.1 Site Summary

	Raw Counts			*AADT*
	Morning Peak	*Evening Peak*	*Total*	*Total*
2009	35	25	60	88
2010	25	37	62	89
2011	**35**	**40**	**75**	**109**

4.2 Morning Peak

Environmental Conditions

- The weather was fine throughout the morning shift.
- There were no road works or accidents that may affect cycle counts.

Key Points

- Cycle volumes at the Harris Road/Smales Road site over the morning monitoring period increased from last year (35 movements, up from 25 in 2010).
- The key movement in the morning is heading west on Smales Road straight onto Allens Road (Movement 2 = 7 movements).
- No movements showed any notable changes from 2010.

Table 4.1: Morning Cyclist Movements

Harris/Smales Road 2009 - 2011(n)

Movement	2009	*2010*	*2011*	Change 10-11
1	2	0	0	**0**
2	8	5	7	**2**
3	3	2	4	**2**
4	1	0	0	**0**
5	9	2	3	**1**
6	1	3	5	**2**
7	0	2	2	**0**
8	0	0	0	**0**
9	2	1	1	**0**
10	2	2	4	**2**
11	4	6	5	**-1**
12	3	2	4	**2**
Total	**35**	**25**	**35**	**10**

- Over the morning peak, all cyclists riding through the Harris/Smales Road intersection are adults (no change from 2010).
- Most cyclists are wearing a helmet (89 per cent, stable from 88 per cent last year).
- The majority of cyclists are male (91 per cent).
- Just over half of cyclists are riding on the road (51 per cent, down from 64 per cent in 2010).

Table 4.2: Morning Cyclist Characteristics

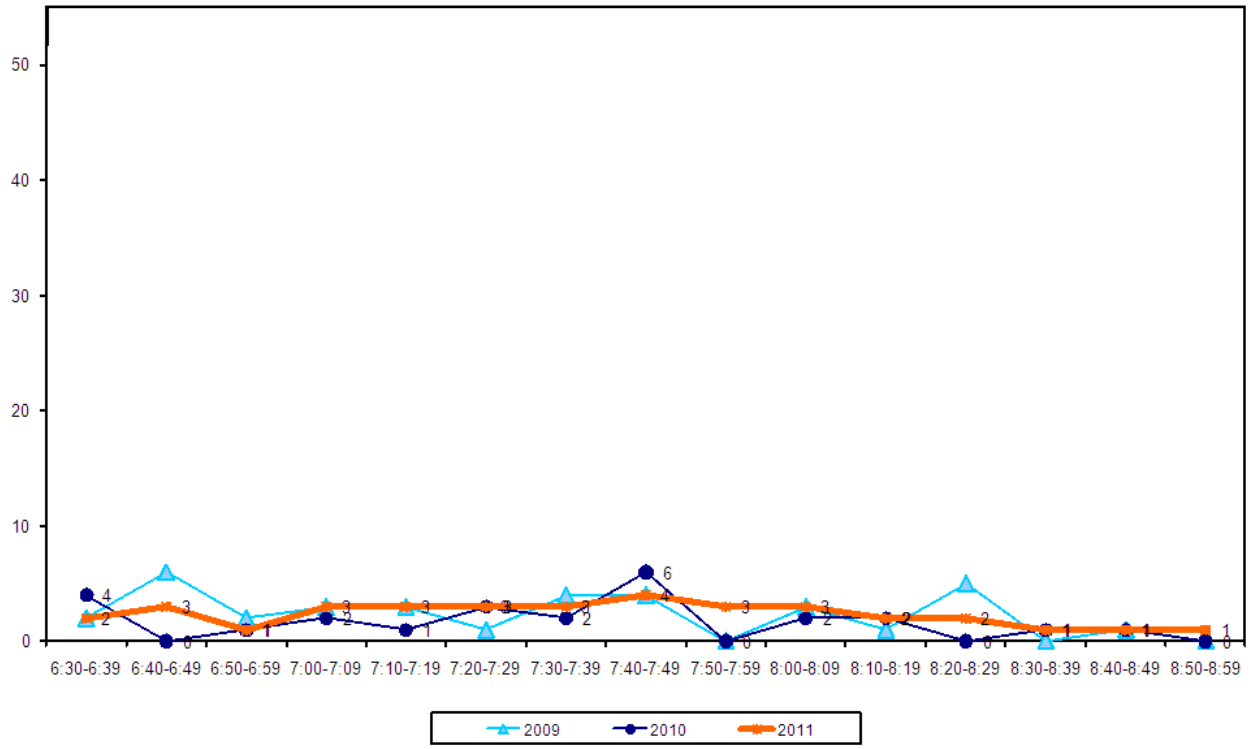
Harris/Smales Road 2009 - 2011 (%)

	2009	***2010***	***2011***	**Change 10-11**
Cyclist Type				
Adult	97	100	100	**0**
School child	3	0	0	**0**
Helmet Wearing				
Helmet on head	83	88	89	**1**
No helmet	17	12	11	**-1**
Gender				
Male	-	-	91	**-**
Female	-	-	0	**-**
Can't tell	-	-	9	**-**
Where Riding				
Road	51	64	51	**-13**
Footpath	49	36	49	**13**
Base:	***35***	***25***	***35***	

- The volume of morning cyclist movements remains stable throughout the observation period with no notable peaks. The greatest number of movements was seen between 7:40am and 7:49am (4 cyclists), the same time period in 2010 when a peak of 6 cyclists was observed.

Figure 4.2: Morning Peak Cyclist Frequency

Harris/Smales Road (n)



4.3 Evening Peak

Environmental Conditions

- The weather was fine throughout the evening shift.
- There were no road works or accidents that may affect cycle counts.

Key Points

- The number of cyclist movements recorded at the Harris/Smales Road intersection has increased slightly from 37 movements in 2010 to 40 movements in 2011.
- The most common movement in the evening is heading east along Allens Road straight onto Smales Road (Movement 8 = 10 movements).
- Cyclist movements have not increased notably at any particular movement.

Table 4.3: Evening Cyclist Movements

Harris/Smales Road 2009 - 2011 (n)

Movement	2009	*2010*	*2011*	Change 10-11
1	2	3	4	**1**
2	1	1	0	**-1**
3	0	0	0	**0**
4	3	2	3	**1**
5	3	6	5	**-1**
6	0	0	0	**0**
7	3	6	8	**2**
8	4	9	10	**1**
9	1	1	2	**1**
10	0	1	1	**0**
11	6	8	7	**-1**
12	2	0	0	**0**
Total	**25**	**37**	**40**	**3**

- All evening cyclists at this site are adults (100 per cent, up slightly from 95 per cent in 2010).
- Most cyclists are wearing a helmet (83 per cent, down notably from 95 per cent last year).
- The majority of cyclists are male (88 per cent).
- Nearly two thirds of cyclists are riding on the road (60 per cent, down from 65 per cent in 2009).

Table 4.4: Evening Cyclist Characteristics

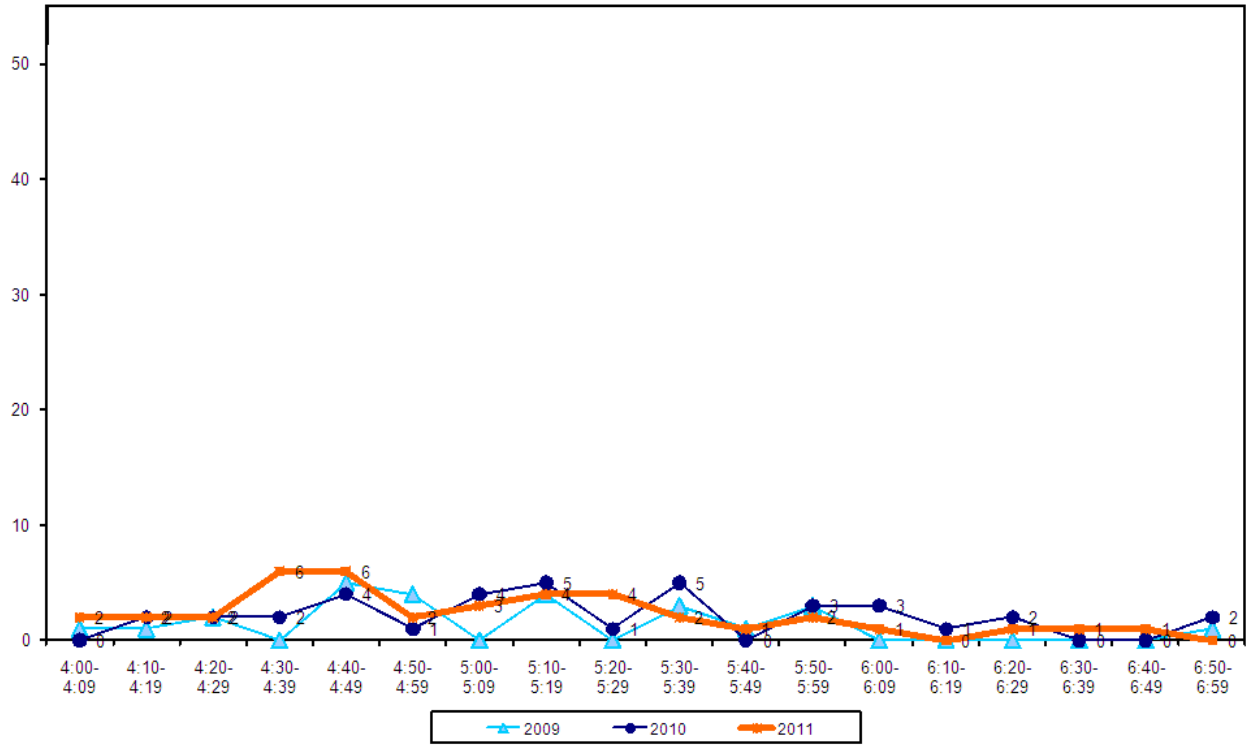
Harris/Smales Road 2009 - 2011 (%)

	2009	*2010*	*2011*	Change 10-11
Cyclist Type				
Adult	96	95	100	**5**
School child	4	5	0	**-5**
Helmet Wearing				
Helmet on head	84	95	83	**-12**
No helmet	16	5	17	**12**
Gender				
Male	-	-	88	**-**
Female	-	-	8	**-**
Can't tell	-	-	5	**-**
Where Riding				
Road	56	65	60	**-5**
Footpath	44	35	40	**5**
Base:	***25***	***37***	***40***	

- The number of cyclist movements per ten minute interval varies throughout the evening shift and peaks between 4:30pm and 4:49pm (6 movements in each 10 minute interval). This is earlier than the slight peaks seen between 5:10pm and 5:19pm (5 movements) and 5:30pm and 5:39pm (also 5 movements) in 2010.

Figure 4.3: Evening Peak Cyclist Frequency

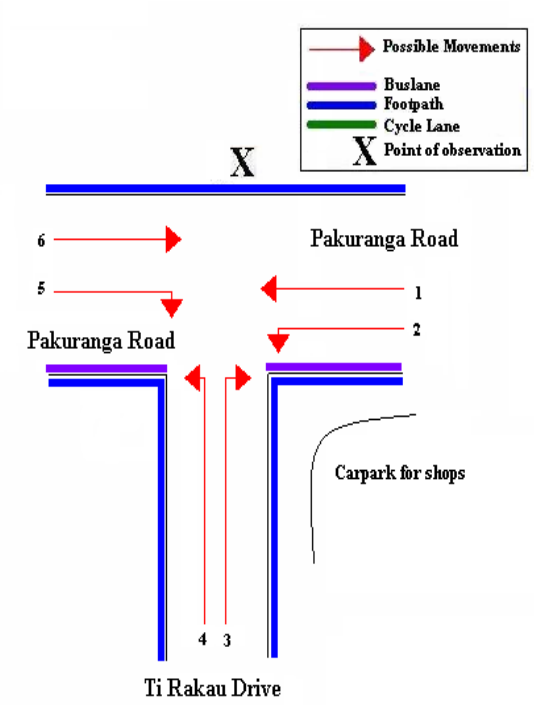
Harris/Smales Road (n)



5. PAKURANGA ROAD/TI RAKAU DRIVE, PAKURANGA (SITE 80)

Figure 5.1 shows the possible cyclist movements at this intersection.

Figure 5.1: Cycle Movements: Pakuranga Road/Ti Rakau Drive



5.1 Site Summary

	Raw Counts			AADT
	Morning Peak	*Evening Peak*	*Total*	*Total*
2009	46	77	123	176
2010	70	92	162	234
2011	**59**	**65**	**124**	**180**

5.2 Morning Peak

Environmental Conditions

- The weather was fine throughout the morning shift.
- There were no road works or accidents that may affect cycle counts.

Key Points

- The number of cycle movements recorded at the Pakuranga Road/Ti Rakau Drive intersection decreased from those recorded in 2010 (59 movements, down from 70 movements).
- The key movements in the morning are turning right from Pakuranga Road into Ti Rakau Drive (Movement 5 = 26 movements) and riding straight along Pakuranga Road heading west (Movement 1 = 17 cyclists).
- The most notable change in cycle volumes is at Movement 6 (up 7 from 2010).

Table 5.1: Morning Cyclist Movements

Pakuranga Road/Ti Rakau Drive 2009 - 2011 (n)

Movement	2009	*2010*	*2011*	Change 10-11
1	10	19	17	**-2**
2	4	0	3	**3**
3	0	0	3	**3**
4	2	8	5	**-3**
5	22	30	26	**-4**
6	8	13	5	**7**
7	0	0	0	**0**
8	0	0	0	**0**
9	0	0	0	**0**
10	0	0	0	**0**
11	0	0	0	**0**
12	0	0	0	**0**
Total	**46**	**70**	**59**	**-11**

- Over the morning peak, most cyclists riding through the Pakuranga Road/Ti Rakau Drive intersection are adults (88 per cent, down from 96 per cent last year).
- All cyclists are wearing a helmet (100 per cent, slightly up from 97 per cent last year).
- The majority of cyclists are male (90 per cent).
- Just over two thirds of cyclists are riding on the road (68 per cent, down notably from 79 per cent in 2010).

Table 5.2: Morning Cyclist Characteristics

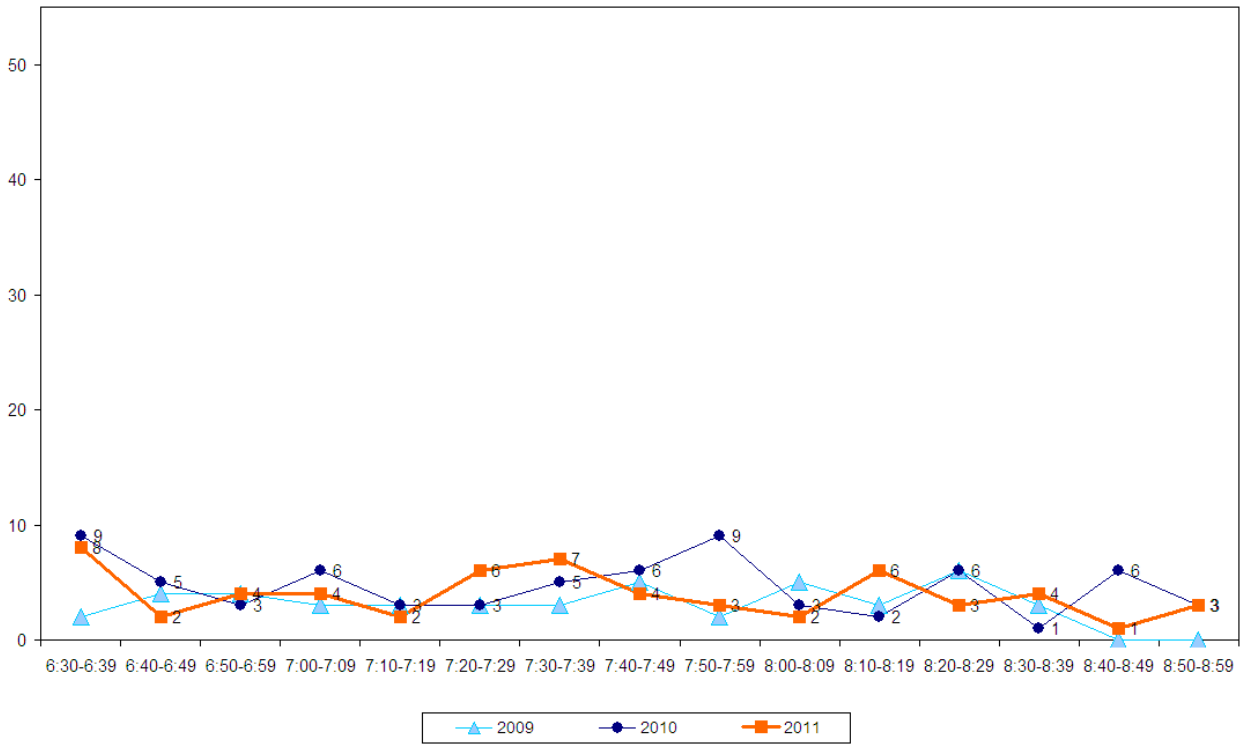
Pakuranga Road/Ti Rakau Drive 2009 - 2011(%)

	2009	*2010*	*2011*	Change 10-11
Cyclist Type				
Adult	85	96	88	**-8**
School child	15	4	12	**8**
Helmet Wearing				
Helmet on head	96	97	100	**3**
No helmet	4	3	0	**-3**
Gender				
Male	-	-	90	**-**
Female	-	-	8	**-**
Can't tell	-	-	2	**-**
Where Riding				
Road	63	79	68	**-11**
Footpath	37	21	32	**11**
Base:	***46***	***70***	***59***	

- The volume of cyclist movements is variable throughout the morning monitoring period, as it was in both 2009 and 2010. A peak occurs at the start of the shift between 6:30am and 6:39am (8 movements), similar to a peak observed in 2010, and again between 7:20am and 7:39am (6 rising to 7 movements). Another slight peak occurs later in the shift between 8:10 and 8:19 (6 movements).

Figure 5.2: Morning Peak Cyclist Frequency

Pakuranga Road/Ti Rakau Drive (n)



5.3 Evening Peak

Environmental Conditions

- The weather was fine throughout the morning shift.
- There were no road works or accidents that may affect cycle counts.

Key Points

- The volume of evening cycle movements decreased notably from 2010 (65 cyclists, down from 92 cyclists).
- The most common movements in the evening are riding straight along Pakuranga Road heading west (Movement 1 = 28 cyclists) and east (Movement 6 = 20 cyclists).
- Cyclist volumes at this site have most notably decreased at Movement 6 (down 13 cyclists) and Movement 4 (down 8 cyclists).

Table 5.3: Evening Cyclist Movements

Pakuranga Road/Ti Rakau Drive 2009 - 2011 (n)

Movement	2009	*2010*	*2011*	Change 10-11
1	19	32	28	**-4**
2	1	0	3	**3**
3	1	2	1	**-1**
4	24	9	1	**-8**
5	11	16	12	**-4**
6	21	33	20	**-13**
7	0	0	0	**0**
8	0	0	0	**0**
9	0	0	0	**0**
10	0	0	0	**0**
11	0	0	0	**0**
12	0	0	0	**0**
Total	**77**	**92**	**65**	**27**

- Most evening cyclists using this intersection are adults (88 per cent, down from 96 per cent last year).
- Almost all cyclists are wearing a helmet (89 per cent, down notably from 98 per cent in 2010).
- Almost all cyclists are male (92 per cent).
- Almost two thirds of cyclists are riding on the road (62 per cent, down from 74 per cent in 2010).

Table 5.4: Evening Cyclist Characteristics

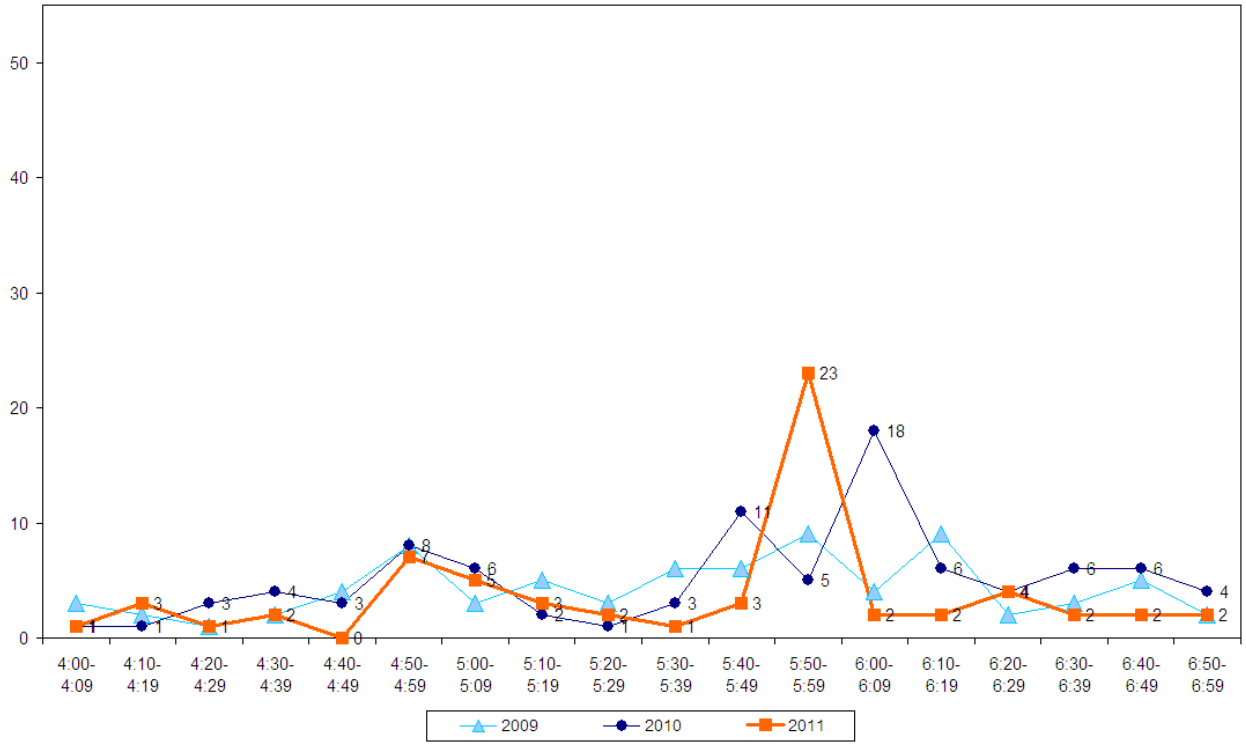
Pakuranga Road/Ti Rakau Drive 2009 - 2011 (%)

	2009	*2010*	*2011*	Change 10-11
Cyclist Type				
Adult	94	96	88	**-8**
School child	6	4	12	**8**
Helmet Wearing				
Helmet on head	87	98	89	**-9**
No helmet	13	2	11	**9**
Gender				
Male	-	-	92	**-**
Female	-	-	5	**-**
Can't tell	-	-	3	**-**
Where Riding				
Road	65	74	62	**-12**
Footpath	35	26	38	**12**
Base:	***77***	***92***	***65***	

- The number of cyclist movements at this observation site peaks between 4:50pm and 4:59 (7 movements) and again, sharply, between 5:50pm and 5:59pm (23 movements. Note that this includes 21 cyclists riding together as a group). This compares to three peaks in the evening shift observed in 2010, between 4:50pm and 4:59pm (7 movements), 5:40pm and 5:49pm (11 movements), and 6:00pm and 6:09pm (18 movements. Note this included 14 cyclists riding together as a group).

Figure 5.3: Evening Peak Cyclist Frequency

Pakuranga Road/Ti Rakau Drive (n)

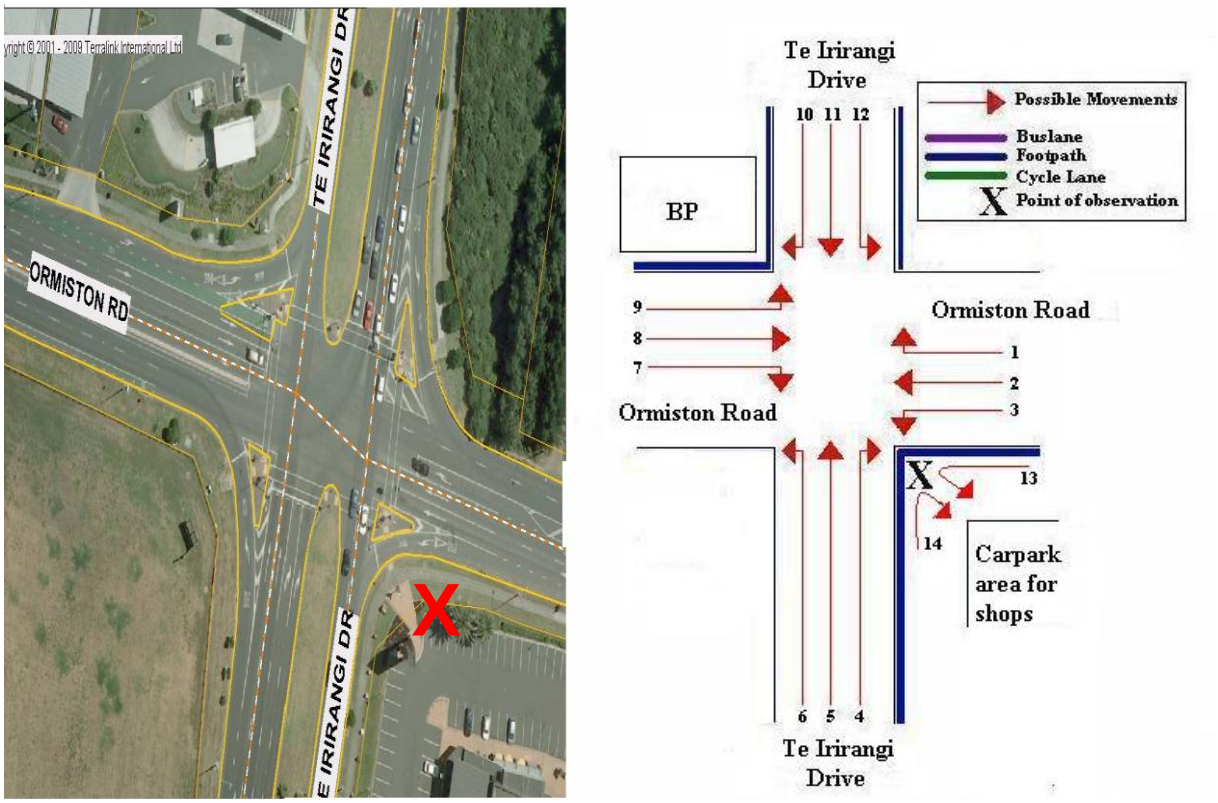


Note: In 2011, 21 cyclists were observed riding together through this site at 5:50pm. This equates to 32 per cent of all evening peak cycle movements.

6. TE IRIRANGI DRIVE/ORMISTON ROAD, EAST TAMAKI (SITE 81)

Figure 6.1 shows the possible cyclist movements at this intersection.

Figure 6.1: Cycle Movements: Te Irirangi Drive/Ormiston Road



6.1 Site Summary

	Raw Counts			AADT
	Morning Peak	*Evening Peak*	*Total*	*Total*
2009	13	20	33	47
2010	25	41	66	95
2011	**24**	**32**	**56**	**81**

6.2 Morning Peak

Environmental Conditions

- The weather was fine throughout the morning shift.
- There were no road works or accidents that may affect cycle counts.

Key Points

- Morning cyclist traffic at the intersection of Te Irirangi Drive and Ormiston Road has remained stable this year, with 24 cycle movements recorded (down from 25 movements in 2010).
- The key movements in the morning at this site are heading northbound along Te Irirangi Drive (Movement 5 = 8 cyclists), and riding straight along Te Irirangi Drive heading south (Movement 11 = 8 cyclists).
- Morning cyclist volumes have most notably increased at Movement 5 (up 5 cyclists).

Table 6.1: Morning Cyclist Movements

Te Irirangi Drive/Ormiston Road 2009 - 2011 (n)

Movement	2009	*2010*	*2011*	Change 10-11
1	4	1	1	**0**
2	1	2	4	**2**
3	0	3	1	**-2**
4	0	0	0	**0**
5	4	3	8	**5**
6	0	0	1	**1**
7	0	0	0	**0**
8	0	3	0	**-3**
9	0	0	0	**0**
10	0	1	1	**0**
11	4	12	8	**-4**
12	0	0	0	**0**
Total	**13**	**25**	**24**	**-1**

- Over the morning peak, the majority of cyclists riding through this intersection are adults (83 per cent, up slightly from 80 per cent last year).
- All cyclists are wearing a helmet (up from 92 per cent last year).
- Three quarters of the cyclists using this site are male (75 per cent).
- The majority of cyclists are riding on the road (67 per cent, up slightly from 64 per cent at the previous measure).

Table 6.2: Morning Cyclist Characteristics

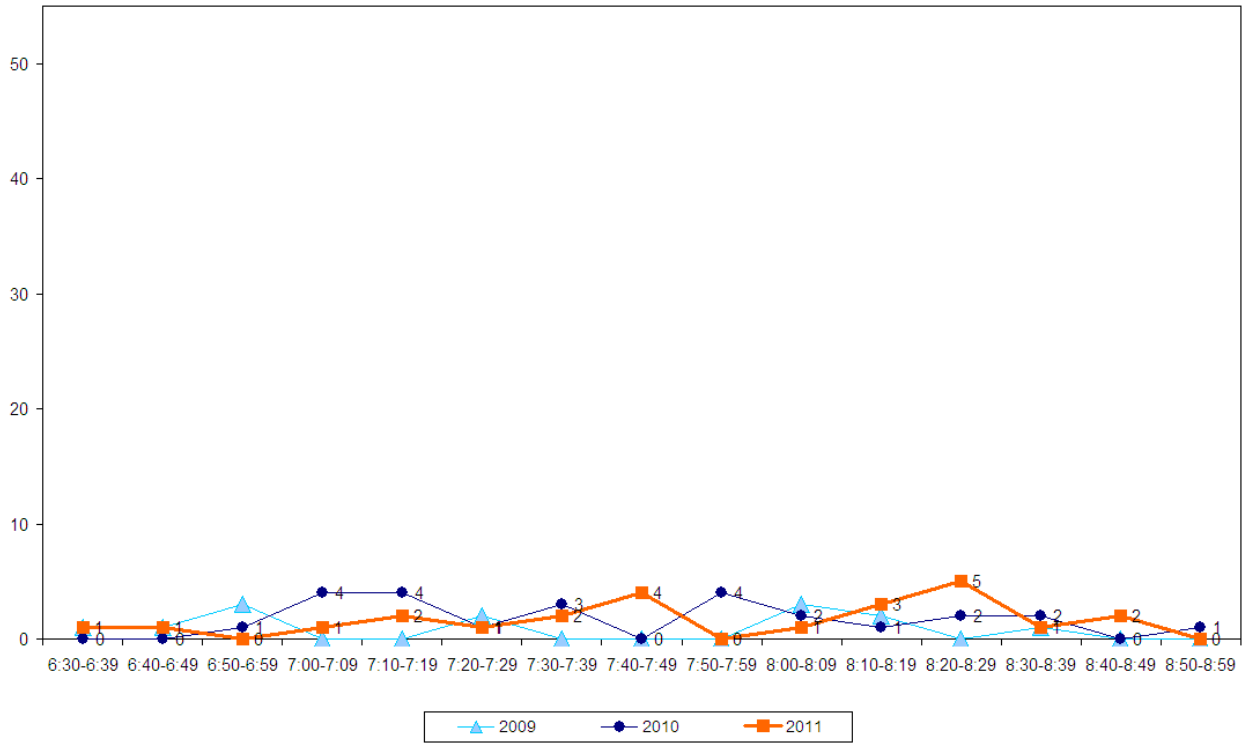
Te Irirangi Drive/Ormiston Road 2009 - 2011 (%)

	2009	*2010*	*2011*	Change 10-11
Cyclist Type				
Adult	69	80	83	**3**
School child	31	20	17	**-3**
Helmet Wearing				
Helmet on head	85	92	100	**8**
No helmet	15	8	0	**-8**
Gender				
Male	-	-	75	**-**
Female	-	-	25	**-**
Can't tell	-	-	0	**-**
Where Riding				
Road	69	64	67	**3**
Footpath	31	36	33	**-3**
Base:	***13***	***25***	***24***	

- The volume of morning cycle movements is relatively low over the entire monitoring period, with no more than five cyclists recorded passing during any ten minute interval.

Figure 6.2: Morning Peak Cyclist Frequency

Te Irirangi Drive/Ormiston Road (n)



6.3 Evening Peak

Environmental Conditions

- The weather was fine throughout the evening monitoring period.
- There were no road works or accidents that may affect cycle counts.

Key Points

- Evening cyclist volumes at the Te Irirangi Drive/Ormiston Road intersection have decreased since 2010, from 41 movements to 32 movements this year.
- The most common movement in the evening is riding straight along Te Irirangi Drive heading north (Movement 5 = 11 cyclists).
- Since 2010, evening cyclist volumes have most notably decreased at Movement 11 (down 11 cyclists).

Table 6.3: Evening Cyclist Movements

Te Irirangi Drive/Ormiston Road 2009 - 2011 (n)

Movement	2009	*2010*	*2011*	Change 10-11
1	0	1	1	**0**
2	1	4	2	**-2**
3	0	0	3	**3**
4	0	0	1	**1**
5	2	8	11	**3**
6	0	0	0	**0**
7	1	0	2	**2**
8	1	6	1	**-5**
9	1	1	1	**0**
10	0	0	0	**0**
11	13	20	9	**-11**
12	1	1	1	**0**
Total	**20**	**41**	**32**	**-9**

- Most evening cyclists using this site are adults (97 per cent, up from 83 per cent at the previous measure).
- Most cyclists are wearing a helmet (97 per cent, down from 78 per cent last year).
- Seventy-eight per cent of cyclists at this site are male.
- The majority of cyclists are riding on the road (88 per cent, up from 76 per cent in 2010).

Table 6.4: Evening Cyclist Characteristics

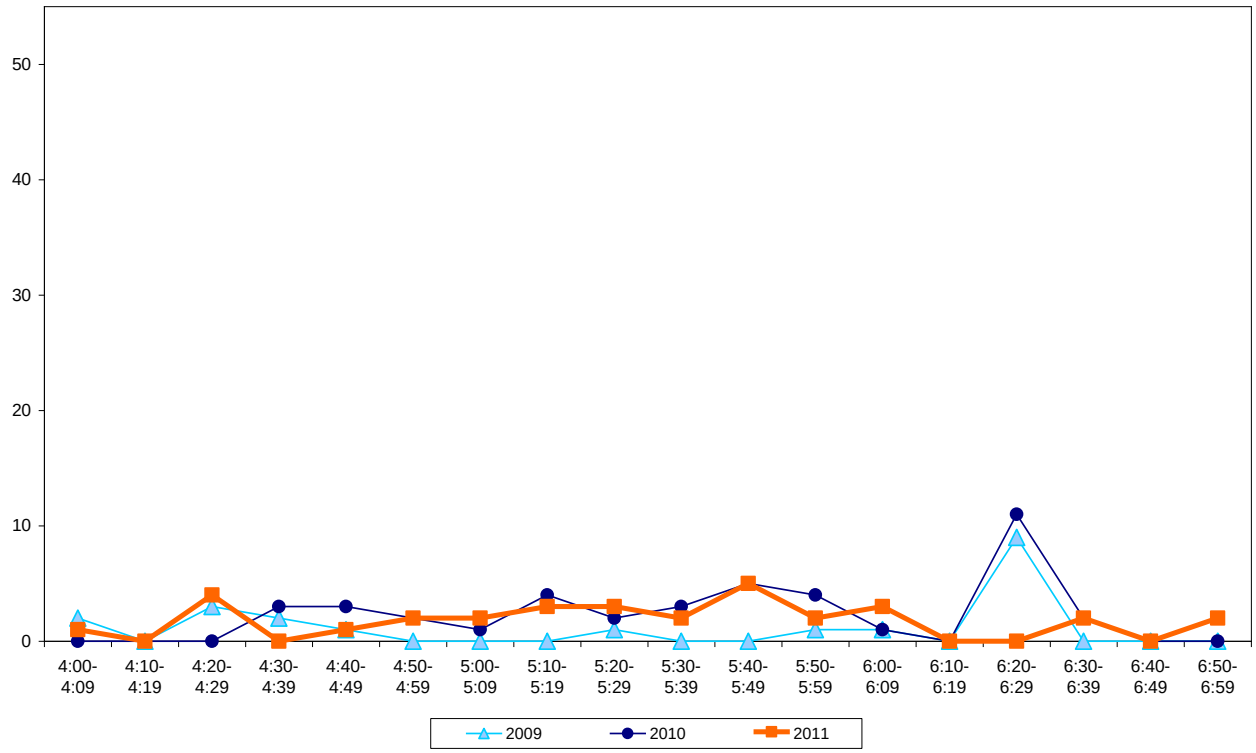
Te Irirangi Drive/Ormiston Road 2009 - 2011 (%)

	2009	*2010*	*2011*	Change 10-11
Cyclist Type				
Adult	95	83	97	**14**
School child	5	17	3	**-14**
Helmet Wearing				
Helmet on head	95	78	97	**19**
No helmet	5	22	3	**-19**
Gender				
Male	-	-	78	**-**
Female	-	-	16	**-**
Can't tell	-	-	6	**-**
Where Riding				
Road	95	76	88	**12**
Footpath	5	24	12	**-12**
Base:	***20***	***41***	***32***	

- Evening cyclist volumes are generally stable throughout the monitoring period this year.

Figure 6.3: Evening Peak Cyclist Frequency

Te Irirangi Drive/Ormiston Road (n)



7. HALF MOON BAY FERRY WHARF

Key Points

- In the morning, no cycles were observed at the Half Moon Bay Ferry Wharf at either 6.10am or 9.10am.
- In the evening, no cycles were recorded at the Half Moon Bay Ferry Wharf at 3.30pm while one cycle was observed at 7.10pm.

Table 7.1: Half Moon Bay Ferry Wharf Cycle Counts (n)

	2010	*2011*	Change 10-11
Morning Peak			
6:10am	2	**0**	-2
9:10am	0	**0**	0
Evening Peak			
3:30pm	1	**0**	-1
7:10pm	0	**1**	1

8. SCHOOL BIKE SHED COUNT

Background Information

- A total of 10 schools in the Howick ward participated in the school bike shed count.
- Of these schools, most reported no policies that restrict students cycling to school[10].
- Mission Heights Junior College noted that one of the four Whanau had Year 7 and Year 10 students away on camp at the time of the bike shed count. Consequently, the cycle count for this school may be lower than usual.
- The designated count day was Tuesday 8th of March[11].

Key Points

- Among the surveyed schools, of those eligible to cycle, on average, one per cent of students are cycling to their schools.
- Across the 10 schools that responded, 134 students were reported to cycle to school.
- This year, Farm Cove Intermediate reported the highest share of cyclists – 7 per cent of all eligible students currently cycling. This is stable from 7 per cent in 2010.
- Of the 10 schools that responded, one had no students cycling to school.

[10] Tyndale Park Christian School reported that students are actively discouraged from cycling to school.
[11] The following schools conducted their counts on alternative days
- Saint Kentigern College – Thursday 10th March
- Macleans College – Tuesday 29th March

Table 8.1 shows the results of the 10 schools surveyed in the Howick ward.

Table 8.1: Summary Table Of School Bike Count

2007-2011 (n)

School Name	*School Type*	*School Roll Eligible To Cycle*	*No. of Cycles Counted*	*Cyclists as share of those eligible*[12]				
				2011	*2010*	*2009*	*2008*	*2007*
Farm Cove Intermediate	Intermediate	558	40	**7%**	7%	9%	6%	4%
Bucklands Beach Intermediate	Intermediate	749	19	**3%**	8%	5%	4%	-
Edgewater College	Secondary	945	18	**2%**	2%	2%	2%	-
Somerville Intermediate	Intermediate	930	18	**2%**	3%	3%	4%	4%
Elim Christian College	Composite	541	9	**2%**	2%	6%	5%	-
Mission Heights Junior College	Intermediate/secondary	595	8	**1%**	5%	3%	-	-
Sancta Maria College	Intermediate/secondary	960	7	**1%**	1%	1%	1%	2%
Macleans College	Secondary	2500	11	**<1%**	-	**2%**	1%	-
Saint Kentigern College	Intermediate/secondary	1660	4	**<1%**	<1%	1%	-	-
Tyndale Park Christian School	Composite	140	0	**0%**	0%	0%	0%	0%
Total		**9578**	**134**	**1%**				

[12] This share is calculated by averaging the number of cycles counted over the total number of students eligible to cycle. The figure obtained is rounded to zero decimal places.

- Table 8.2 illustrates the rates of cycling to school at different school levels. Rates of cycling to school are highest among intermediate schools (3 per cent, down from 6 per cent last year).

Table 8.2: Summary Table Of School Bike Count by School Type

2007-2011 (%)

School Type	***Number of Schools Responded in 2011***	***Cyclists as share of those eligible***					**Change 10-11**
		2007	***2008***	***2009***	***2010***	***2011***	
Intermediate	3	4%	5%	6%	6%	**3%**	-3
Secondary	2	-	1%	2%	2%	**1%**	-1
Composite	2	0%	3%	4%	1%	**1%**	0
Intermediate/secondary	3	2%	1%	2%	2%	**1%**	-1

APPENDICES

Appendix One: Annual Average Daily Traffic (AADT) Calculation

APPENDIX ONE: ANNUAL AVERAGE DAILY TRAFFIC (AADT) CALCULATION

Note: This description of the calculation of the Annual Average Daily Traffic Flow of Cyclists has been provided by ViaStrada based on their May 2007 report for ARTA entitled "Development of a Cycle Traffic AADT Tool".

Purpose

The purpose of this appendix is to document the recommended procedure for estimating a cycling AADT[13] in the Auckland region from any Gravitas manual count.

Method for Estimating AADT

The methodology is based on that published in Appendix 2 of the Cycle Network and Route Planning Guide (CNRPG)[14], adjusted for Auckland conditions based on data collected during March 2007. The aim was to use the published methodology as much as possible, with any necessary departure from it documented below. The following equation yields the best estimate of a cycling AADT:

$$AADT_{Cyc} = Count \times \frac{1}{\sum H} \times \frac{1}{D} \times \frac{W}{7} \times \frac{1}{R}$$

where *Count = result of count period*

H = scale factor for time of day

D = scale factor for day of week

W = scale factor for week of year

R = scale factor for weather conditions on the count day

If more than one set of count data is available (for example, both a morning count and afternoon count), then **the calculation should be carried out for each set of data, and the estimates derived from each averaged**.

The values for the scale factors (*H, D*, *W* and *R*) have been deduced in the ViaStrada report and are included in this report in Figure 1.

[13] Annual average daily traffic

[14] LTSA, 2004

For the Gravitas counts, the following factors apply:

$\sum H_{AM} = 30$; $\sum H_{PM} = 33.3$; (AM and PM refer to morning and afternoon respectively)

D = 14

W = 0.9

$R_{DRY} = 100$; $R_{WET} = 64$ (DRY and WET refer to fine and rainy conditions respectively)

These can be combined as a single multiplier to convert the manual count to an AADT estimate as follows:

	Morning	Afternoon
Dry weather	**3.06**	**2.78**
Wet weather	**4.78**	**4.35**

Worked Example

If morning and afternoon manual traffic counts are available at a site, the AADT can be calculated using the count summaries for each period. For example, a morning survey of 102 and an afternoon survey of 130 are suggested. It is assumed for this example that the weather was fine in both surveys.

- Thus the AADT from the morning survey is estimated as 3.06 x 102 = 312.
- The AADT from the afternoon survey is estimated as 2.78 x 130 = 359.
- The average of these two estimates is 335; this is the estimate of AADT for this site, based on the two surveys.

Figure 1: Scale Factors for Auckland Region

Period Starting	Period Ending	Interval (hours)	$H_{Weekday}$ Mon to Fri	$H_{Weekend}$ Sat & Sun
0:00	6:30	6.50	5.5%	1.8%
6:30	6:45	0.25	2.3%	0.8%
6:45	7:00	0.25	2.6%	1.5%
7:00	7:15	0.25	3.2%	1.4%
7:15	7:30	0.25	3.7%	2.1%
7:30	7:45	0.25	3.8%	2.8%
7:45	8:00	0.25	4.0%	3.3%
8:00	8:15	0.25	3.9%	3.2%
8:15	8:30	0.25	3.1%	3.8%
8:30	8:45	0.25	2.3%	3.5%
8:45	9:00	0.25	1.3%	3.5%
9:00	10:00	1.00	4.2%	13.6%
10:00	11:00	1.00	3.4%	11.6%
11:00	12:00	1.00	2.6%	9.1%
12:00	13:00	1.00	2.7%	6.6%
13:00	14:00	1.00	2.7%	5.0%
14:00	14:15	0.25	0.7%	1.9%
14:15	14:30	0.25	0.7%	1.3%
14:30	14:45	0.25	0.6%	1.3%
14:45	15:00	0.25	0.6%	1.2%
15:00	15:15	0.25	0.8%	1.1%
15:15	15:30	0.25	1.0%	0.9%
15:30	15:45	0.25	1.3%	1.4%
15:45	16:00	0.25	1.2%	1.3%
16:00	16:15	0.25	2.1%	1.0%
16:15	16:30	0.25	2.3%	1.7%
16:30	16:45	0.25	2.1%	1.0%
16:45	17:00	0.25	2.5%	1.2%
17:00	17:15	0.25	3.3%	1.2%
17:15	17:30	0.25	3.7%	1.2%
17:30	17:45	0.25	4.0%	1.1%
17:45	18:00	0.25	3.2%	1.1%
18:00	18:15	0.25	3.0%	0.9%
18:15	18:30	0.25	2.7%	0.7%
18:30	18:45	0.25	2.4%	0.8%
18:45	19:00	0.25	2.1%	0.6%
19:00	20:00	1.00	5.6%	2.0%
20:00	0:00	4.00	3.0%	1.5%
		24.00	100.0%	100.0%

Day	D
Monday	14%
Tuesday	14%
Wednesday	14%
Thursday	14%
Friday	14%
Saturday	14%
Sunday	16%

Period	W
Summer holidays	1.0
Term 1	0.9
April holidays	1.0
Term 2	1.0
July holidays	1.2
Term 3	1.1
Sep/Oct holidays	1.2
Term 4	1.0

Weather	R
Fine	100%
Rain	64%