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Research Report Prepared for
Auckland Transport

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2013 Auckland Region Manual Cycle Monitor

- Howick Ward -

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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].

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:

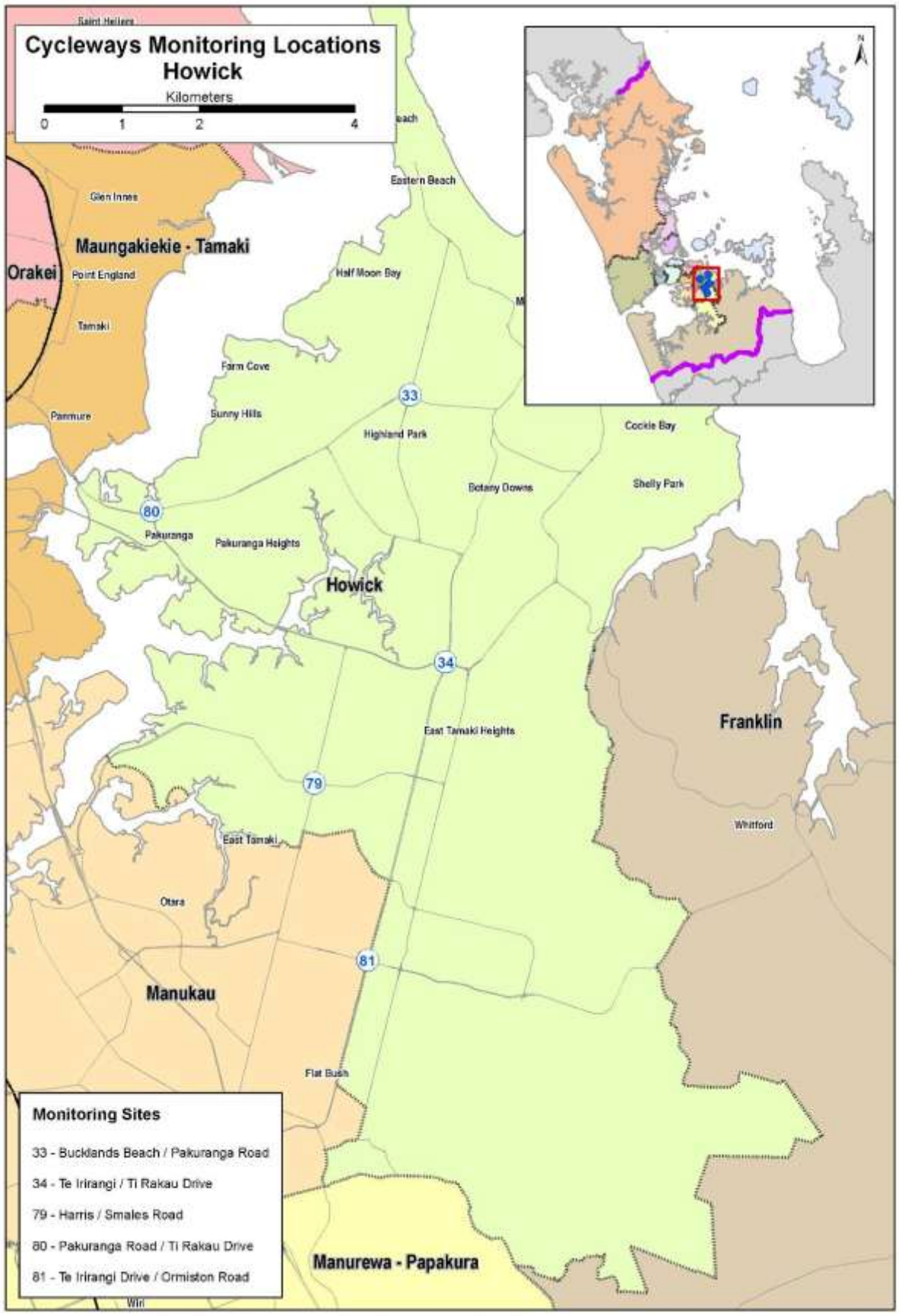
- standard monitoring days are used – that is, school and tertiary holidays, and statutory holidays are excluded and that monitoring preferably takes place at the same time each year to enable reliable year-on-year comparisons to be made. Decisions about whether cycle counts take place on weekdays and 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 five sites (and one ferry terminal) 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 previous years, 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: 2013 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 85 different sites throughout the region. Sites were distributed by ward as follows:

- Albany 15 sites
- Albert-Eden–Roskill 11 sites
- Franklin 2 sites
- Howick 5 sites
- Manukau 10 sites
- Manurewa-Papakura 4 sites
- Maungakiekie-Tamaki 7 sites
- North Shore 8 sites
- Orakei 3 sites
- Waitakere 13 sites
- Waitemata and Gulf 10 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 5th of March and be conducted on the first three fine days of the 5th, 6th, 7th, 12th, 13th, or 14th of March.

Counts were conducted on the following days:

- Tuesday 5th March — Albany, North Shore, Waitakere
- Wednesday 6th March — Howick, Franklin, Manukau, Waitemata & Gulf
- Thursday 7th March — Whau, Albert-Eden-Roskill, Orakei, Manurewa-Papakura, Maungakiekie-Tamaki

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

Weather and Daylight Conditions

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 four count days in 2013 was as follows:

Tuesday 5th March

- Sunrise: 7:10am; Sunset: 7:55pm.
- Highest temperature: 24.0 degrees Celsius.
- Mostly fine weather with a few sites experiencing light drizzle in the morning and cloud in the evening.

Wednesday 6th March

- Sunrise: 7:11am; Sunset: 7:53pm.
- Highest temperature: 24.0 degrees Celsius.
- Mostly fine weather with clear sky in the morning and evening shifts.

Thursday 7th March

- Sunrise: 7:12am; Sunset: 7:52pm.
- Highest temperature: 26.0 degrees Celsius.
- Mostly fine weather with some clouds for some sites in 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).
- Onehunga Harbour Road (Site 17, Maungakiekie-Tamaki 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.

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.

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

2. This email was then sent to all eligible schools in Auckland region (n=306) 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 5th 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 2013, 283 responses were received, a response rate of 92 per cent. (This compares with 74 per cent in 2012).

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 to Six of this report.

Note: Surveying in the Howick ward was undertaken on Wednesday 6th of March, 2013. Sunrise was at 7:11am and sunset was at 7:53pm. The highest temperature was 24.0 degrees Celsius.

1.4 Morning Peak

Environmental Conditions

- All sites had fine weather in the morning peak.
- 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 increased by 13 per cent (180 in 2013, compared with 159 in 2012).
- The average volume of morning cyclists across the five sites monitored is 36 cycle movements, up from 32 cycle movements in 2012.
- No morning cyclists were riding in groups. This result is consistent with 2011 and 2012.
- The busiest site in the morning peak continued to be the intersection of Ti Rakau Drive and Pakuranga Road (55 movements, up from 51 movements last year), whereas the site at Bucklands Beach/Pakuranga Road had the lowest level of morning cyclist traffic (26 cycle movements).
- All but one site recorded increases over the last 12 months, the most noticeable at Te Irirangi/Ti Rakau Drive – up 72 per cent.
- In contrast, Bucklands Beach/Pakuranga Road registered a 35 per cent decrease in morning peak cycle volume.

Table 1.1: Summary of Morning Cyclist Movements
2007 – 2013 (n)

Site No.	*Locations*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	Change 12-13	Change 07-13
34	Te Irirangi Drive/Ti Rakau Drive	36	36	30	30	37	30	**41**	**37%**	**14%**
33	Bucklands Beach/Pakuranga Road	68	53	51	45	43	40	**26**	**-35%**	**-62%**
	Average per site (for 2 sites since 2007)	**52**	**45**	**41**	**37**	**40**	**35**	**34**	**-3%**	**-35%**
	Total (for 2 sites since 2007)	**104**	**89**	**81**	**75**	**80**	**70**	**67**	**-4%**	**-36%**
80	Pakuranga Road/Ti Rakau Drive	-	-	46	70	59	51	**55**	**8%**	-
81	Te Irirangi Drive/Ormiston Road	-	-	13	25	24	18	**31**	**72%**	-
79	Harris/Smales Road	-	-	35	25	35	20	**27**	**35%**	-
	Average per site (all sites)	**-**	**-**	**35**	**39**	**40**	**32**	**36**	**11%**	-
	Total (all sites)	**-**	**-**	**175**	**195**	**198**	**159**	**180**	**13%**	-

- The majority of morning cyclists were adults (92 per cent, up from 81 per cent last year).
- Helmet-wearing continued to be widespread (91 per cent, stable from last year).
- Four in five morning cyclists were males (81 per cent).
- Sixty-nine per cent of cyclists were riding on the road (up from 58 per cent in 2012).

Table 1.2: Summary of Morning Cyclist Characteristics

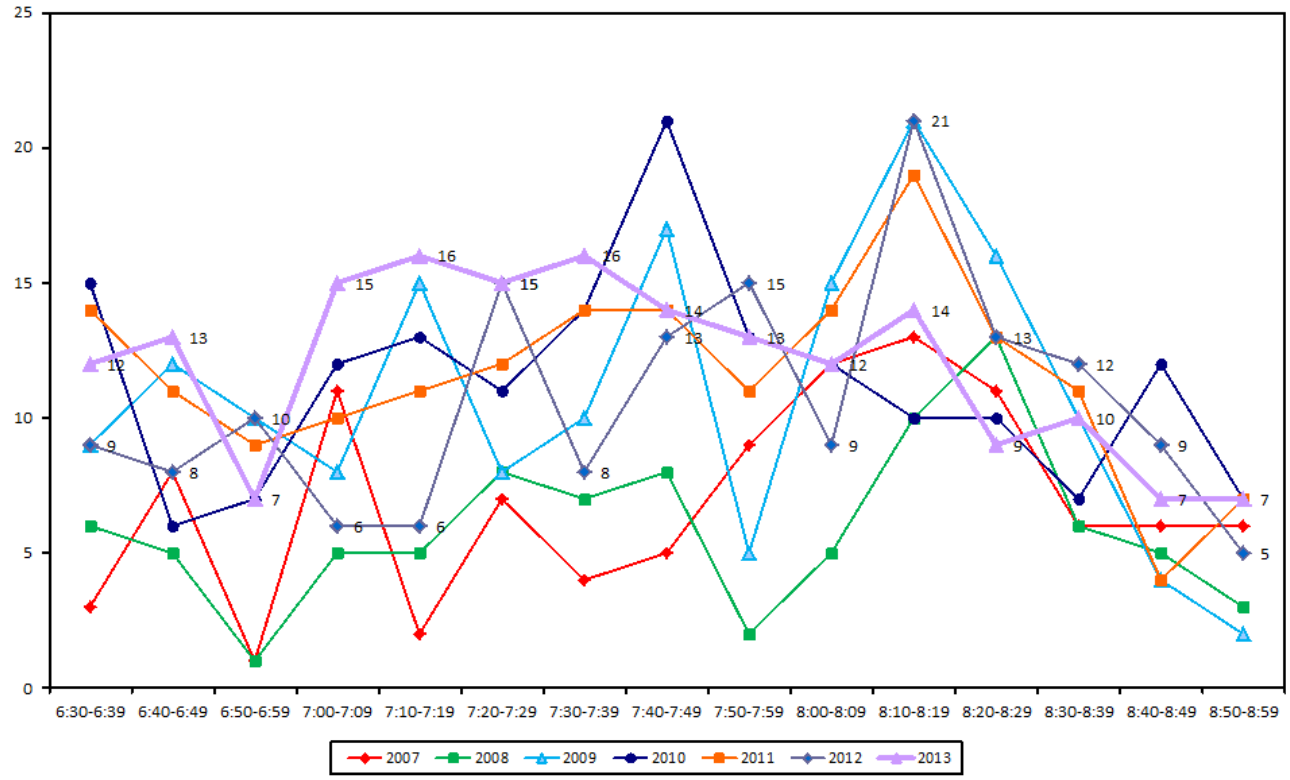
2007 – 2013 (%)

	2007	***2008***	***2009***	***2010***	***2011***	***2012***	***2013***	**Change 12-13**
Cyclist Type								
Adult	62	73	76	85	84	81	**92**	**11**
School child	38	27	24	15	16	19	**8**	**-11**
Helmet Wearing								
Helmet on head	80	92	90	93	95	90	**91**	**1**
No helmet	20	8	10	7	5	10	**9**	**-1**
Gender								
Male	-	-	-	-	89	88	**81**	**7**
Female	-	-	-	-	7	8	**11**	**-3**
Can't tell	-	-	-	-	4	4	**8**	**-4**
Where Riding								
Road	42	65	58	68	63	58	**69**	**11**
Footpath	58	35	42	32	37	42	**31**	**-11**
Base:	***104***	***89***	***175***	***195***	***198***	***159***	***180***	

- Figure 1.2 illustrates the total number of cyclists in the morning peak by time of movement. Morning cycle traffic increased to a slight peak between 7:00am to 7:39am, with a total of 62 movements in this time frame. From there, cycle volume gradually decreased until the end of the monitoring period.

Figure 1.2: Total Cyclist Frequency – Morning Peak

2007 – 2013 (n)



1.5 Evening Peak

Environmental Conditions

- All sites had fine weather in the evening peak.
- 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 increased, from 233 movements in 2012 to 274 movements this year by 18 per cent.
- Twenty-two movements (8 per cent) were made by cyclists riding in groups. This compares with 17 cyclists (7 per cent) in 2012.
- The average volume of evening cyclists across all five sites is 55, up from 47 movements last year.
- The Pakuranga Road/Ti Rakau Drive intersection continues to be the busiest in terms of the evening cyclists' activity (79 cycle movements, up from 76 movements last year). The intersection of Harris/Smales Road has the lowest level of evening cyclist traffic (30 cycle movements, up from 24 movements last year).
- All sites but one recorded increases this year compared to 2012 – the most noticeable being Te Irirangi Drive/Ormiston Road, up 69 per cent.
- Bucklands Beach/Pakuranga Road recorded no change in cycle volume this year.

Table 1.3: Summary of Evening Cyclist Movements

2007 – 2013 (n)

Site No.	*Locations*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	Change 12-13	Change 07-13
34	Te Irirangi Drive/Ti Rakau Drive	45	39	29	48	39	56	**66**	**19%**	**46%**
33	Bucklands Beach/Pakuranga Road	72	77	43	69	64	45	**45**	**0%**	**-60%**
	Average per site (for 2 sites since 2007)	**59**	**58**	**36**	**59**	**52**	**51**	**56**	**8%**	**-5%**
	Total (for 2 sites since 2007)	**117**	**116**	**72**	**117**	**103**	**101**	**111**	**10%**	**-5%**
80	Pakuranga Road/Ti Rakau Drive	-	-	77	92	65	76	**79**	**4%**	-
81	Te Irirangi Drive/Ormiston Road	-	-	20	41	32	32	**54**	**69%**	-
79	Harris/Smales Road	-	-	25	37	40	24	**30**	**25%**	-
	Average per site (all sites)	**-**	**-**	**39**	**57**	**48**	**47**	**55**	**17%**	-
	Total (all sites)	**-**	**-**	**194**	**287**	**240**	**233**	**274**	**18%**	-

- Evening cyclist characteristics this year showed that the majority of evening cyclists in this ward were adults (92 per cent, down slightly from 95 per cent last year).
- Ninety-three per cent of the cyclists were wearing a helmet, the highest recorded since monitoring began in 2007.
- Most evening peak cyclists were male (85 per cent, stable from last year).
- Riding on the road continued to be the most common (71 per cent, up from 64 per cent last year).

Table 1.4: Summary of Evening Cyclist Characteristics

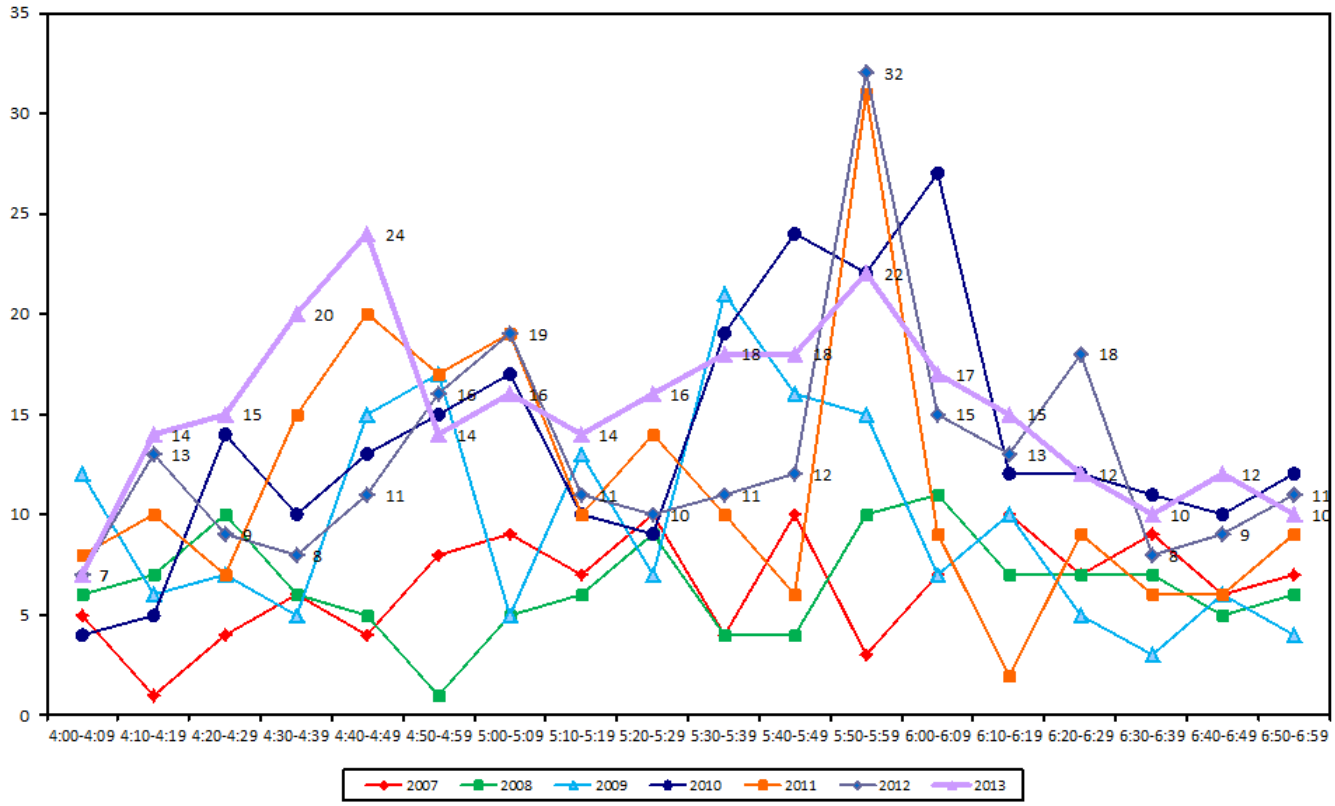
2007 – 2013 (%)

	2007	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	Change 12-13
Cyclist Type								
Adult	84	75	93	85	89	95	**92**	**-3**
School child	16	25	7	15	11	5	**8**	**3**
Helmet Wearing								
Helmet on head	75	79	89	90	89	92	**93**	**1**
No helmet	25	21	11	10	11	8	**7**	**-1**
Gender								
Male	-	-	-	-	90	86	**85**	**-1**
Female	-	-	-	-	5	8	**8**	**0**
Can't tell	-	-	-	-	5	6	**7**	**1**
Where Riding								
Road	46	54	65	72	65	64	**71**	**8**
Footpath	54	46	35	28	35	36	**29**	**-8**
Base:	***117***	***116***	***194***	***287***	***240***	***233***	***274***	

- The overall pattern of cyclist volumes by time of movement in the evening is illustrated in Figure 1.3. Evening cyclist volumes peaked twice during the observation period, once between 4:40pm and 4:49pm (24 movements) and again between 5:50pm and 5:59pm (22 movements).

Figure 1.3: Total Cyclist Frequency – Evening Peak

2007 – 2013 (n)



1.6 Aggregate Total

- A total of 454 cyclist movements were recorded across the five sites in 2013. This result is up from 392 movements in 2012, a 16 per cent increase.
- Five per cent of the total movements (n=22) were made by pelotons.
- The average number of movements per site is up from 78 last year to 91 this year.
- The busiest site is the intersection of Pakuranga Road and Ti Rakau Drive with a total of 134 movements (up from 127 movements in 2012), while Harris/Smales Road has the lowest number of cyclist volumes (57 movements, up from 44 movements last year).
- Four sites recorded increases this year with the most noticeable being Te Irirangi Drive/Ormiston Road (up 70 per cent from 2012).
- The only site to report a decrease in total cyclist numbers was Bucklands Beach/Pakuranga Road, down 16 per cent to 71 cyclists in 2013.

Table 1.5: Summary of Total Cyclist Movements

2007 – 2013 (n)

Site No.	*Locations*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	Change 12-13	Change 07-13
34	Te Irirangi Drive/Ti Rakau Drive	81	75	59	78	76	86	**107**	**24%**	**32%**
33	Bucklands Beach/Pakuranga Road	140	130	94	114	107	85	**71**	**-16%**	**-49%**
	Average per site (for 2 sites since 2007)	**111**	**103**	**77**	**96**	**92**	**86**	**89**	**3%**	**-20%**
	Total (for 2 sites since 2007)	**221**	**205**	**153**	**192**	**183**	**171**	**178**	**4%**	**-19%**
80	Pakuranga Road/Ti Rakau Drive	-	-	123	162	124	127	**134**	**5%**	**-**
81	Te Irirangi Drive/Ormiston Road	-	-	33	66	56	50	**85**	**70%**	**-**
79	Harris/Smales Road	-	-	60	62	75	44	**57**	**30%**	**-**
	Average per site (all sites)	-	-	**74**	**96**	**88**	**78**	**91**	**17%**	**-**
	Total (all sites)	**-**	**-**	**369**	**482**	**438**	**392**	**454**	**16%**	**-**

- Overall cyclist characteristics are illustrated in Table 1.6. In total, 92 per cent of cyclists were adults (up from 89 per cent in 2012).
- Most cyclists were wearing a helmet (92 per cent, stable from last year).
- Almost all cyclists were male (83 per cent).
- Seventy per cent of cyclists were riding on the road (up from 61 per cent in 2012).

Table 1.6: Summary of Total Cyclist Characteristics

2007 – 2013 (%)

	2007	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	Change 12-13
Cyclist Type								
Adult	74	74	85	85	86	89	**92**	**3**
School child	26	26	15	15	14	11	**8**	**-3**
Helmet Wearing								
Helmet on head	77	85	89	91	91	91	**92**	**1**
No helmet	23	15	11	9	9	9	**8**	**-1**
Gender								
Male	-	-	-	-	89	87	**83**	**-4**
Female	-	-	-	-	6	8	**9**	**1**
Can't tell	-	-	-	-	5	5	**8**	**3**
Where Riding								
Road	44	59	62	70	64	61	**70**	**9**
Footpath	56	41	38	30	36	39	**30**	**-9**
Base:	***221***	***205***	***369***	***482***	***438***	***392***	***454***	

1.7 Average Annual Daily Traffic (AADT) Estimate

Note: A discussion of Average Annual Daily Traffic Estimates is provided in Section 1.1. A full description of the tool, the calculation used, and the limitations of the estimates are provided in Appendix One. Readers are encouraged to review these sections in conjunction with the data presented here.

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 (193 daily movements) and the lowest is at Harris/Smales Road (83 daily movements).
- Only one site recorded a decrease in cycle traffic this year. Site 33 Bucklands Beach/Pakuranga Road intersection experienced a 17 per cent decline from last year.
- The other four sites all registered increases in cycle traffic, most noticeable at Site 81 Te Irirangi Drive/Ormiston Road which had a 69 per cent increase.

Table 1.7: AADT Estimates Based on Morning and Evening Cyclist Movements 2007 – 2013 (n)

Site No.	*Locations*	*2007 AADT*	*2008 AADT*	*2009 AADT*	*2010 AADT*	*2011 AADT*	*2012 AADT*	*2013 AADT*	Change 12-13	Change 07-13
80	Pakuranga Road/Ti Rakau Drive	-	-	176	234	180	183	**193**	**5%**	-
34	Te Irirangi Drive/Ti Rakau Drive	117	109	86	112	110	123	**154**	**25%**	**32%**
81	Te Irirangi Drive/Ormiston Road	-	-	47	95	81	72	**122**	**69%**	-
33	Bucklands Beach/Pakuranga Road	203	187	137	164	154	123	**102**	**-17%**	**-50%**
79	Harris/Smales Road	-	-	88	89	109	64	**83**	**30%**	-

1.8 Ferry Wharf Bike Count Summary

Key Points

- Two cycles were observed at the Half Moon Bay Ferry Wharf in the morning.
- No cycles were observed in the evening shift.

1.9 School Bike Shed Count Summary

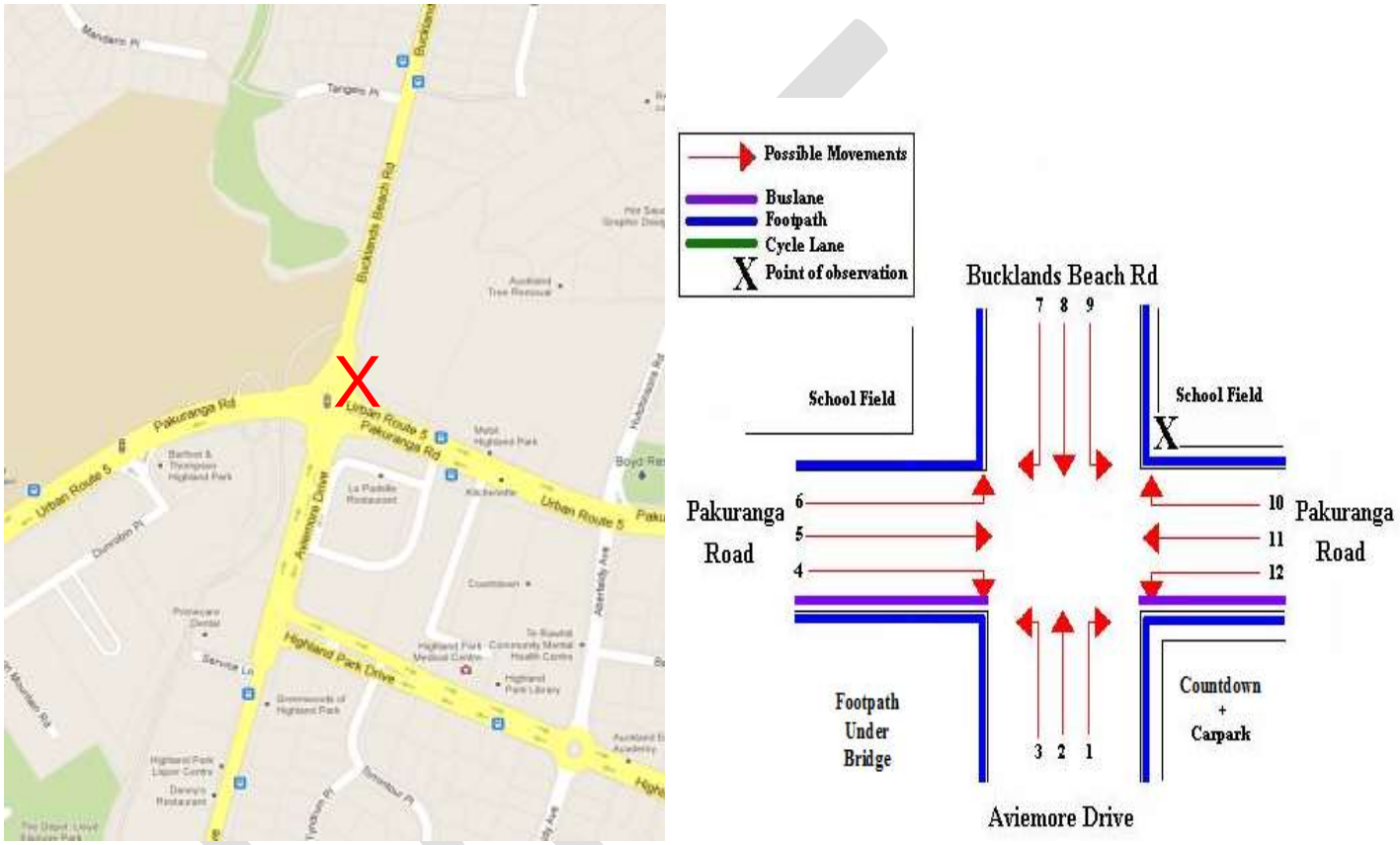
Key Points

- Among the surveyed schools, of those eligible to cycle, on average, one per cent of students are cycling to their schools. This result is unchanged from 2012.
- Across the 13 schools that responded, 155 students were reported cycling to school.
- This year, Farm Cove Intermediate reported the highest share of cyclists – 5 per cent of all eligible students currently cycling. This is stable from 5 per cent in 2012.
- Of the 13 schools that responded, one (8 per cent) had no students cycling to school.
- Rates of cycling to school are highest among intermediate and composite schools (each 2 per cent, unchanged from 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
2012	40	45	85	123
2013	**26**	**45**	**71**	**102**

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 26 cyclist movements were recorded, the lowest count since monitoring began in 2007.
- The most common morning movement was straight along Aviemore Drive to Bucklands Beach Road (Movement 2 = 5 movements).
- The most noticeable decrease were reported for Movement 11 – riding along Pakuranga Road in a westerly direction (down 9 movements) and Movement 3 – left turn from Aviemore Drive onto Pakuranga Road (down 6 movements).

Table 2.1: Morning Cyclist Movements

Bucklands Beach/Pakuranga Road 2007 – 2013 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	Change 12-13
1	0	0	0	0	1	0	**0**	**0**
2	7	6	3	3	3	0	**5**	**5**
3	15	8	12	6	4	9	**3**	**-6**
4	1	0	2	4	1	0	**3**	**3**
5	3	3	6	7	2	1	**2**	**1**
6	2	3	2	2	2	1	**0**	**-1**
7	5	3	2	4	6	5	**1**	**-4**
8	5	8	9	3	8	7	**4**	**-3**
9	5	3	1	2	1	4	**4**	**0**
10	2	2	0	4	2	1	**1**	**0**
11	22	16	14	9	13	12	**3**	**-9**
12	1	1	0	1	0	0	**0**	**0**
Total	**68**	**53**	**51**	**45**	**43**	**40**	**26**	**-14**

- There has been a 33 percentage point decrease in the share of school children cyclists since 2012. This year only 19 per cent of cyclists were recorded as children.
- Most cyclists were wearing a helmet (85 per cent, stable from the previous year).
- The majority of the cyclists were male (81 per cent).
- The incidence of cyclists riding on the footpath has declined slightly (62 per cent, compared with 67 per cent last year).

Table 2.2: Morning Cyclist Characteristics

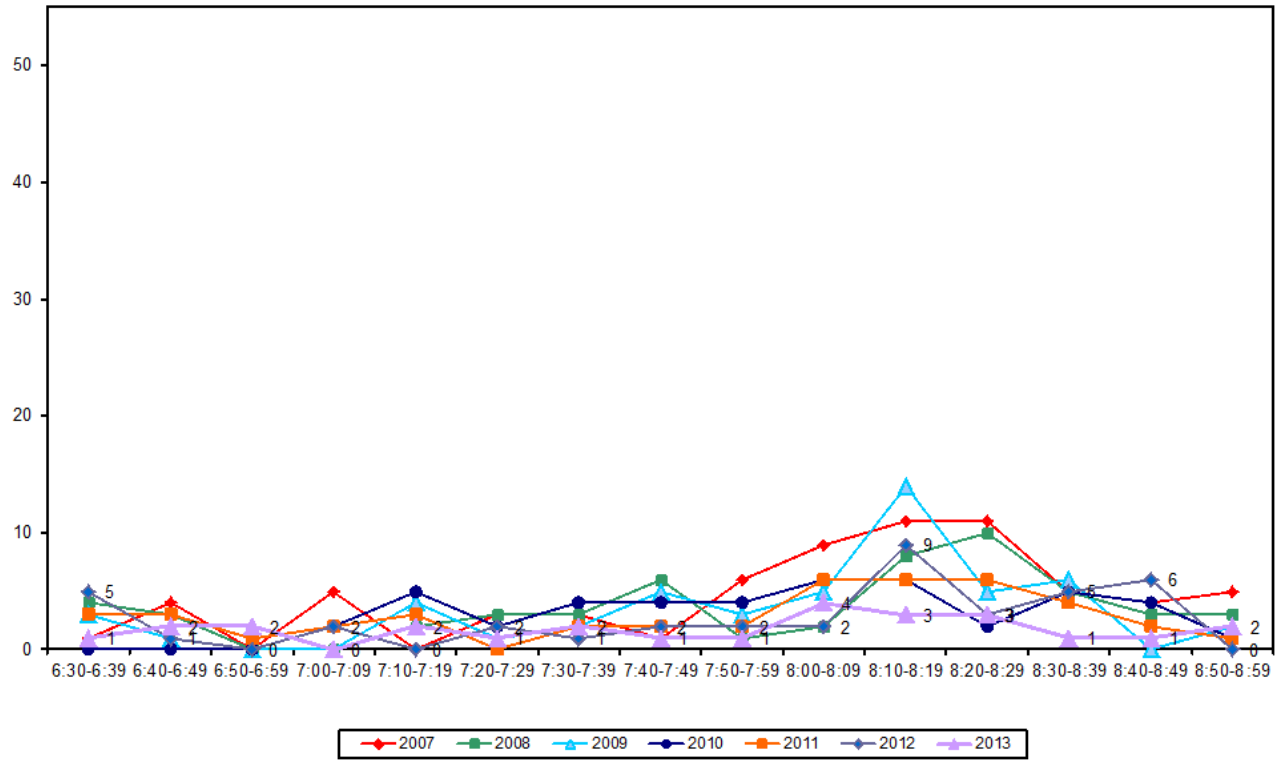
Bucklands Beach/Pakuranga Road 2007 – 2013 (%)

	2007	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	Change 12-13
Cyclist Type								
Adult	43	58	45	62	60	48	**81**	**33**
School child	57	42	55	38	40	52	**19**	**-33**
Helmet Wearing								
Helmet on head	75	91	90	87	88	85	**85**	**0**
No helmet	25	9	10	13	12	15	**15**	**0**
Gender								
Male	-	-	-	-	86	95	**81**	**-14**
Female	-	-	-	-	5	0	**15**	**15**
Can't tell	-	-	-	-	9	5	**4**	**-1**
Where Riding								
Road	24	47	39	36	44	33	**38**	**5**
Footpath	76	53	61	64	56	67	**62**	**-5**
Base:	***68***	***53***	***51***	***45***	***43***	***40***	***26***	

- The volume of morning cyclist movements has been very low this year, with no ten-minute intervals having more than four cyclists riding past. Consistent with the decline in the share of children using this site, the noticeable increase in cycle volume between 8:10am and 8:19am in previous years was not evident in 2013.

Figure 2.2: Morning Peak Cyclist Frequency

Bucklands Beach/Pakuranga Road 2007 – 2013 (n)



2.3 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

- A total of 45 cycle movements were recorded at this site in the evening, the same as last year.
- The most common movement in the evening was straight along Pakuranga Road heading east (Movement 5 = 8 movements).
- Across the twelve movements possible at this intersection, the most noticeable change has been at Movement 8 – riding from Bucklands Beach Road to Aviemore Drive (down 7 movements).

Table 2.3: Evening Cyclist Movements

Bucklands Beach/Pakuranga Road 2007 – 2013 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	Change 12-13
1	0	1	0	0	0	1	**0**	**-1**
2	4	7	11	9	10	5	**5**	**0**
3	4	8	2	1	3	3	**4**	**1**
4	11	10	4	6	1	4	**6**	**2**
5	10	9	7	11	14	4	**8**	**4**
6	7	6	2	7	2	4	**4**	**0**
7	11	9	5	2	3	5	**4**	**-1**
8	7	7	6	12	14	11	**4**	**-7**
9	4	4	1	6	7	2	**2**	**0**
10	4	8	0	0	5	1	**2**	**1**
11	10	6	4	14	4	5	**6**	**1**
12	0	2	1	1	1	0	**0**	**0**
Total	**72**	**77**	**43**	**69**	**64**	**45**	**45**	**0**

- The share of cyclists who are school children has increased by 23 percentage points to comprise a third of the evening cycle volume (36 per cent).
- Most cyclists at this site were wearing a helmet (87 per cent, stable from 89 per cent last year).
- The majority of cyclists were male (84 per cent, down from 89 per cent last year).
- Compared with last year, the share of cyclists riding on the footpath has increased by 19 percentage points.

Table 2.4: Evening Cyclist Characteristics

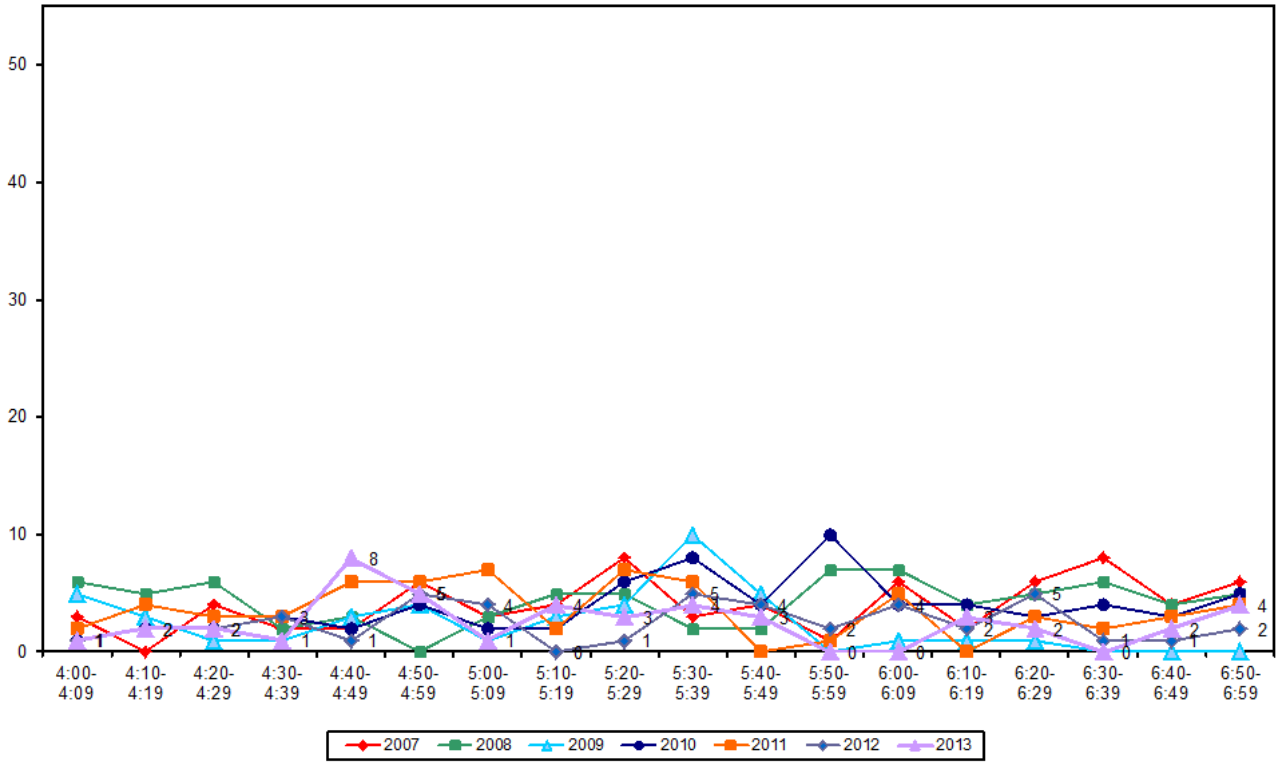
Bucklands Beach/Pakuranga Road 2007 – 2013 (%)

	2007	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	Change 12-13
Cyclist Type								
Adult	76	65	91	70	75	87	**64**	**-23**
School child	24	35	9	30	25	13	**36**	**23**
Helmet Wearing								
Helmet on head	68	77	86	81	83	89	**87**	**-2**
No helmet	32	23	14	19	17	11	**13**	**2**
Gender								
Male	-	-	-	-	88	89	**84**	**-5**
Female	-	-	-	-	3	9	**16**	**7**
Can't tell	-	-	-	-	9	2	**0**	**-2**
Where Riding								
Road	38	44	53	64	58	58	**39**	**-19**
Footpath	62	56	47	36	42	42	**61**	**19**
Base:	***72***	***77***	***43***	***69***	***64***	***45***	***45***	

- This year, the number of cyclist movements varied over time with the greatest peak between 4:40pm and 4:59pm (8 movements).

Figure 2.3: Evening Peak Cyclist Frequency

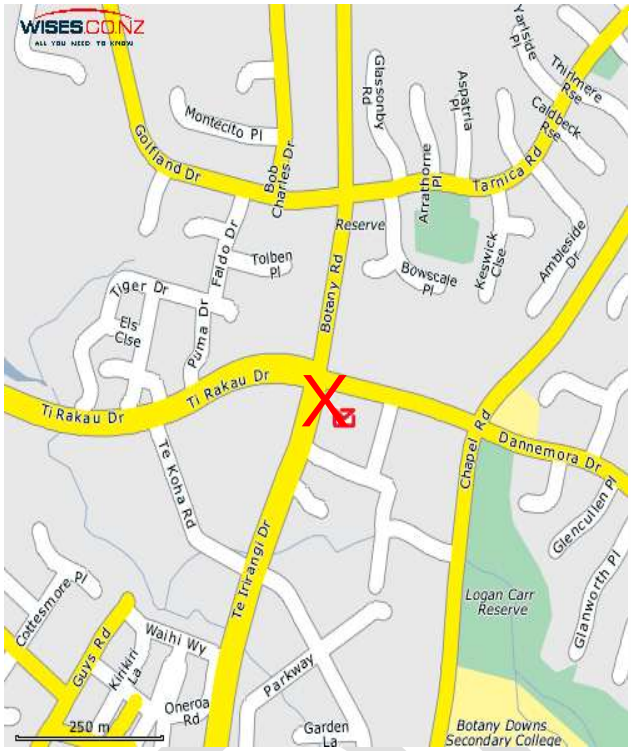
Bucklands Beach/Pakuranga Road 2007 – 2013 (n)

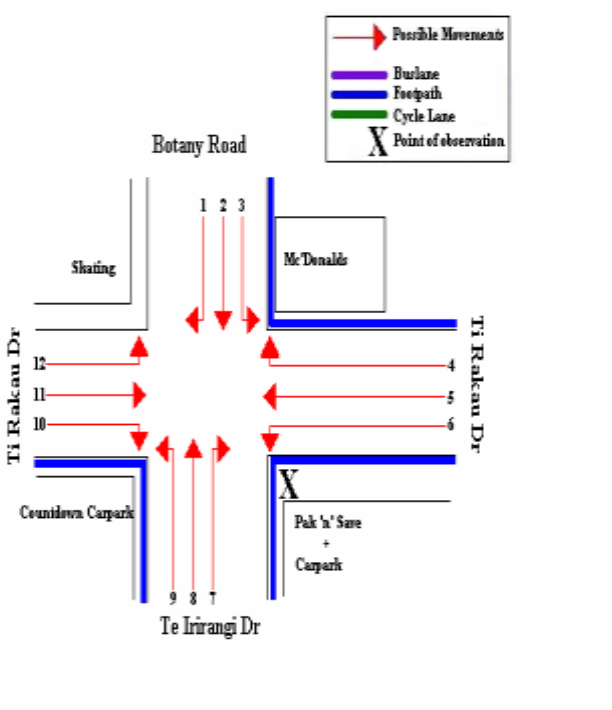


3. TE IRIRANGI DRIVE/TI RAKAU DRIVE, BOTANY DOWNS (SITE 34)

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
2012	30	56	86	123
2013	**41**	**66**	**107**	**154**

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 2012 to 41 movements in 2013.
- The key movement in the morning was straight along Botany Road heading south (Movement 2 = 13 movements).
- The most noticeable changes occurred at Movement 11 (up 4 cyclists) and at Movement 10 (up 3 cyclists).

Table 3.1: Morning Cyclist Movements

Te Irirangi /Ti Rakau Drive 2007 – 2013 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	Change 12-13
1	13	10	6	4	7	9	**9**	**0**
2	8	12	13	12	14	11	**13**	**2**
3	1	0	2	1	0	2	**3**	**1**
4	0	0	0	0	1	0	**2**	**2**
5	6	6	4	4	4	1	**3**	**2**
6	1	0	0	0	2	1	**0**	**-1**
7	1	0	0	1	1	0	**0**	**0**
8	4	3	2	1	3	2	**1**	**-1**
9	1	1	0	0	1	2	**0**	**-2**
10	1	1	0	5	2	0	**3**	**3**
11	0	2	3	1	1	2	**6**	**4**
12	0	1	0	1	1	0	**1**	**1**
Total	**36**	**36**	**30**	**30**	**37**	**30**	**41**	**11**

- Over the morning peak, most cyclists were adults (88 per cent, stable from the previous measure).
- Almost all cyclists were wearing a helmet (93 per cent, slightly down from 97 per cent last year).
- Over two-thirds of cyclists were male (71 per cent, a slight increase from 67 per cent last year).
- The percentage of cyclists riding on the road has increased in comparison to last year, up 7 percentage points since 2012 to 76 per cent.

Table 3.2: Morning Cyclist Characteristics

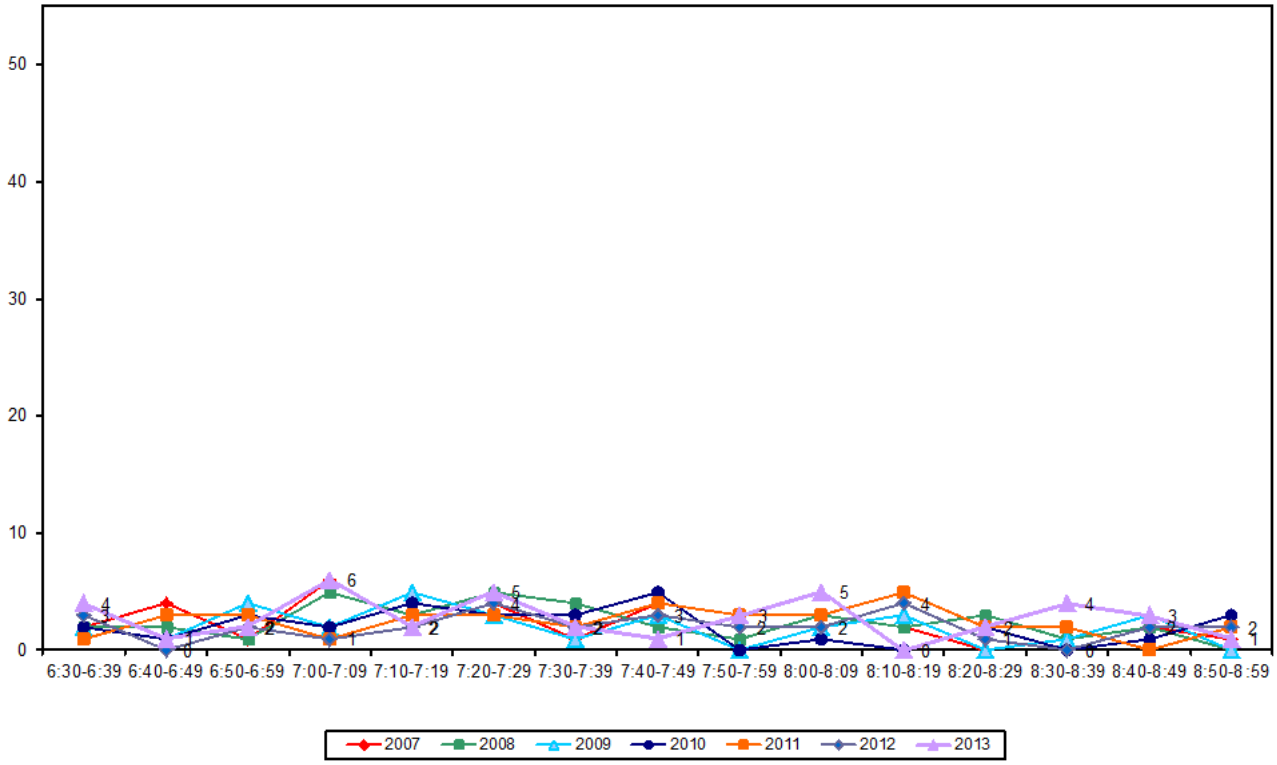
Te Irirangi /Ti Rakau Drive 2007 – 2013 (%)

	2007	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	Change 12-13
Cyclist Type								
Adult	97	94	93	87	89	87	**88**	**1**
School child	3	6	7	13	11	13	**12**	**-1**
Helmet Wearing								
Helmet on head	89	94	90	100	97	97	**93**	**-4**
No helmet	11	6	10	0	3	3	**7**	**4**
Gender								
Male	-	-	-	-	86	67	**71**	**4**
Female	-	-	-	-	14	20	**12**	**-8**
Can't tell	-	-	-	-	0	13	**17**	**4**
Where Riding								
Road	58	75	70	83	68	63	**76**	**7**
Footpath	42	25	30	17	32	37	**24**	**-7**
Base:	***36***	***36***	***30***	***30***	***37***	***30***	***41***	

- Morning cycle volume was low throughout the monitoring period. The greatest number of cycle movements occurred between 7:00am and 7:09am (6 movements).

Figure 3.2: Morning Peak Cyclist Frequency

Te Irirangi /Ti Rakau Drive 2007 – 2013 (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

- The total number of evening cyclist movements observed at the Te Irirangi/Ti Rakau Drive intersection has increased, from 56 movements in 2012 to 66 movements this year, the highest count since monitoring began in 2007.
- The most common evening movement was straight along Te Irirangi Drive onto Botany Road (Movement 8 = 17 movements).
- Movement 6 experienced the greatest change in cyclist volume when compared to last year's counts, increasing by 14 movements.

Table 3.3: Evening Cyclist Movements

Te Irirangi /Ti Rakau Drive 2007 – 2013 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	Change 12-13
1	3	1	0	9	2	2	**1**	**-1**
2	11	3	4	2	5	6	**12**	**6**
3	3	0	0	1	4	3	**3**	**0**
4	5	1	0	2	0	4	**5**	**1**
5	0	4	7	5	6	2	**1**	**-1**
6	0	0	0	0	0	0	**14**	**14**
7	1	2	0	2	6	3	**2**	**-1**
8	11	16	5	6	1	15	**17**	**2**
9	0	0	0	1	0	3	**1**	**-2**
10	4	0	6	3	2	4	**4**	**0**
11	3	7	5	10	12	2	**2**	**0**
12	4	5	2	7	1	12	**4**	**-8**
Total	**45**	**39**	**29**	**48**	**39**	**56**	**66**	**10**

- All cyclists using this intersection during the evening period were adults.
- Almost all cyclists at this site were wearing a helmet (98 per cent, unchanged from 2012).
- Two-thirds of the cyclists were male (68 per cent, unchanged from 2012).
- The majority of the cyclists were riding on the road (88 per cent, a 22 percentage point increase from last year).

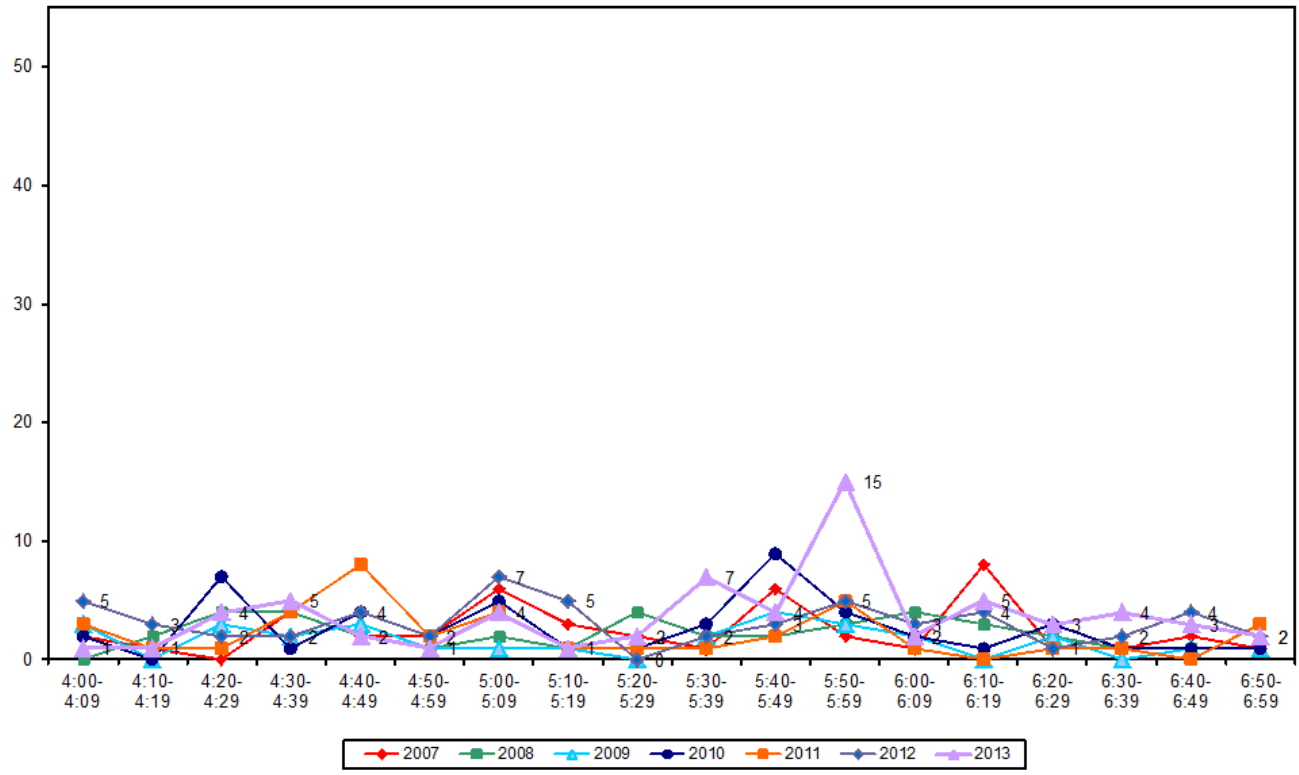
Table 3.4: Evening Cyclist Characteristics

Te Irirangi /Ti Rakau Drive 2007 – 2013 (%)

	2007	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	Change 12-13
Cyclist Type								
Adult	98	95	90	81	95	98	**100**	**2**
School child	2	5	10	19	5	2	**0**	**-2**
Helmet Wearing								
Helmet on head	87	82	97	94	97	98	**98**	**0**
No helmet	13	18	3	6	3	2	**2**	**0**
Gender								
Male	-	-	-	-	92	68	**68**	**0**
Female	-	-	-	-	8	11	**6**	**-5**
Can't tell	-	-	-	-	0	21	**26**	**5**
Where Riding								
Road	58	59	59	69	69	66	**88**	**22**
Footpath	42	41	41	31	31	34	**12**	**-22**
Base:	***45***	***39***	***29***	***48***	***39***	***56***	***66***	

- The volume of cyclist movements in the evening was generally low throughout the entire monitoring period. However, a sharp peak was observed between 5:50pm and 5:59pm (15 movements).

Figure 3.3: Evening Peak Cyclist Frequency
Te Irirangi/Ti Rakau Drive 2007 – 2013 (n)

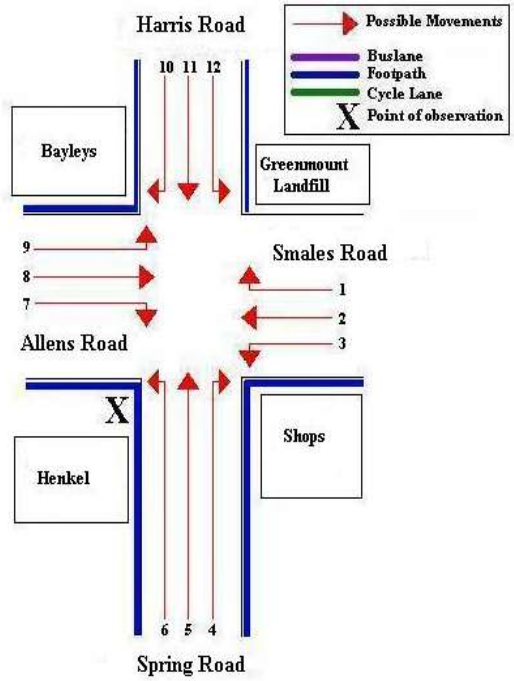


Note: A group of 13 cyclists rode past at 5:55pm. This accounted for 20 per cent of the evening cycle volume at this site.

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
2012	20	24	44	64
2013	**27**	**30**	**57**	**83**

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 (27 movements, up from 20 in 2012).
- The key movement in the morning was heading west on Smales Road straight onto Allens Road (Movement 2 = 8 movements).
- The most noticeable change in cycle traffic occurred at Movement 8 – going from Allens Road to Smales Road (up 4 movements). No cyclists had been seen making this movement in any previous year.

Table 4.1: Morning Cyclist Movements

Harris/Smales Road 2009 – 2013(n)

Movement	2009	*2010*	*2011*	*2012*	*2013*	Change 12-13
1	2	0	0	1	**1**	**0**
2	8	5	7	5	**8**	**3**
3	3	2	4	2	**2**	**0**
4	1	0	0	0	**0**	**0**
5	9	2	3	3	**1**	**-2**
6	1	3	5	1	**1**	**0**
7	0	2	2	0	**1**	**1**
8	0	0	0	0	**4**	**4**
9	2	1	1	0	**0**	**0**
10	2	2	4	1	**1**	**0**
11	4	6	5	4	**7**	**3**
12	3	2	4	3	**1**	**-2**
Total	**35**	**25**	**35**	**20**	**27**	**7**

- Over the morning peak, all cyclists riding through the Harris/Smales Road intersection were adults (no change since 2010).
- Most cyclists were wearing a helmet (96 per cent, up from 90 per cent last year).
- All cyclists were male (100 per cent).
- Seventy-four per cent of cyclists are riding on the road (up slightly from 70 per cent in 2012).

Table 4.2: Morning Cyclist Characteristics

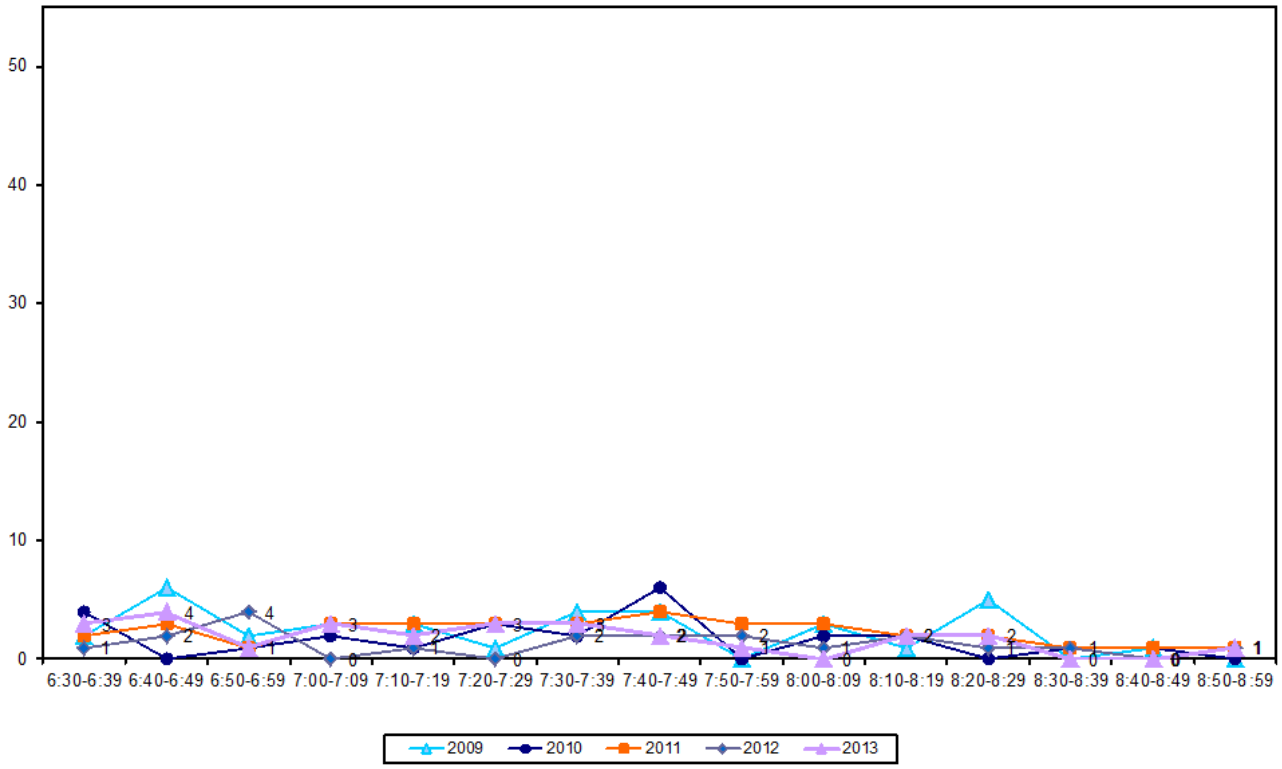
Harris/Smales Road 2009 – 2013 (%)

	2009	*2010*	*2011*	*2012*	*2013*	Change 12-13
Cyclist Type						
Adult	97	100	100	100	**100**	**0**
School child	3	0	0	0	**0**	**0**
Helmet Wearing						
Helmet on head	83	88	89	90	**96**	**6**
No helmet	17	12	11	10	**4**	**-6**
Gender						
Male	-	-	91	100	**100**	**0**
Female	-	-	0	0	**0**	**0**
Can't tell	-	-	9	0	**0**	**0**
Where Riding						
Road	51	64	51	70	**74**	**4**
Footpath	49	36	49	30	**26**	**-4**
Base:	***35***	***25***	***35***	***20***	***27***	

- The volume of morning cyclist movements has remained low, with no ten-minute intervals having more than four cyclists riding past. Most of the cycle traffic occurred during the first half of the monitoring period.

Figure 4.2: Morning Peak Cyclist Frequency

Harris/Smales Road 2009 – 2013 (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 by 6 movements to a total of 30 in 2013.
- The most common movement in the evening was heading from Harris Road straight onto Spring Road (Movement 11 = 8 cyclists).
- No significant changes in cyclist volume were observed at all 12 movements.

Table 4.3: Evening Cyclist Movements

Harris/Smales Road 2009 – 2013 (n)

Movement	2009	*2010*	*2011*	*2012*	*2013*	Change 12-13
1	2	3	4	2	**4**	**2**
2	1	1	0	1	**2**	**1**
3	0	0	0	0	**0**	**0**
4	3	2	3	2	**3**	**1**
5	3	6	5	3	**4**	**1**
6	0	0	0	1	**0**	**-1**
7	3	6	8	2	**2**	**0**
8	4	9	10	3	**4**	**1**
9	1	1	2	1	**0**	**-1**
10	0	1	1	2	**1**	**-1**
11	6	8	7	6	**8**	**2**
12	2	0	0	1	**2**	**1**
Total	**25**	**37**	**40**	**24**	**30**	**6**

- All evening cyclists at this site were adults (100 per cent, unchanged since 2011).
- Most cyclists were wearing a helmet (93 per cent, up 10 percentage points since last year).
- Most cyclists were male (97 per cent, up slightly from last year).
- Sixty-seven per cent of cyclists were riding on the road (up from 54 per cent in 2012).

Table 4.4: Evening Cyclist Characteristics

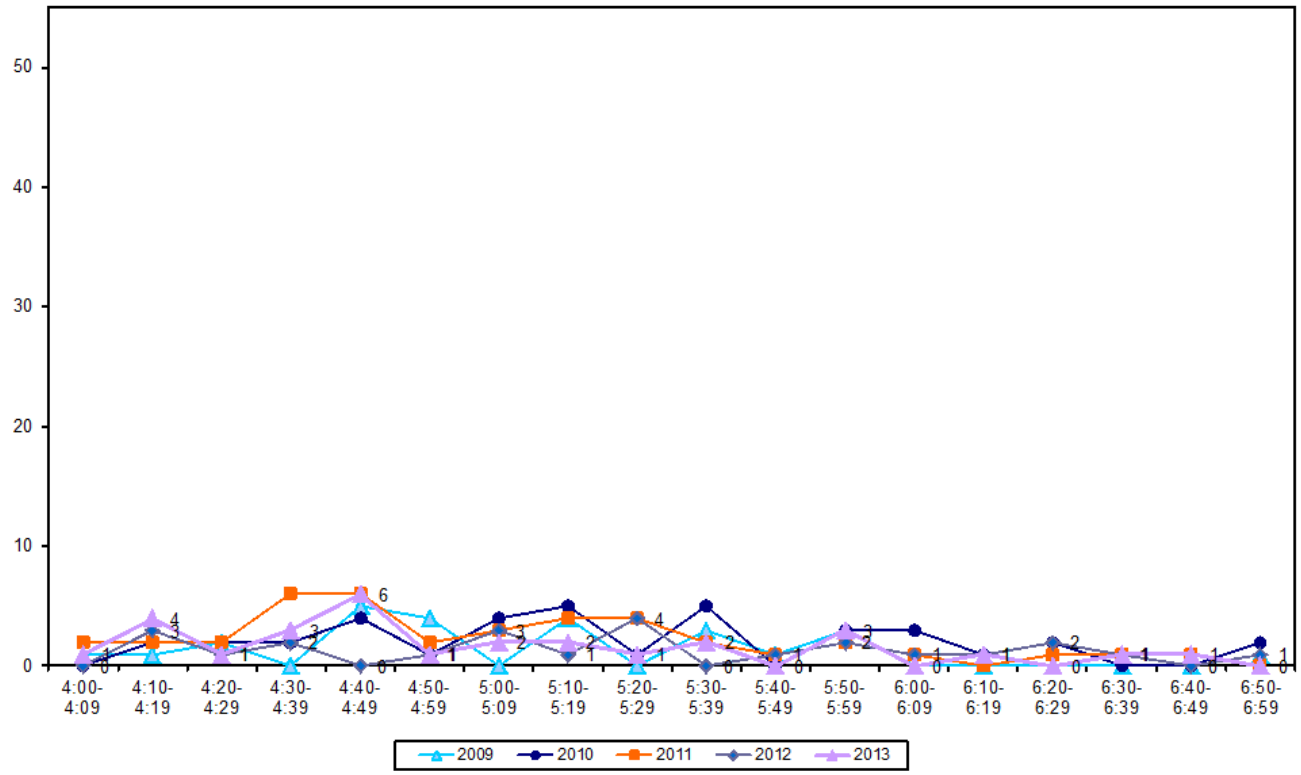
Harris/Smales Road 2009 – 2013 (%)

	2009	***2010***	***2011***	***2012***	***2013***	**Change 12-13**
Cyclist Type						
Adult	96	95	100	100	**100**	**0**
School child	4	5	0	0	**0**	**0**
Helmet Wearing						
Helmet on head	84	95	83	83	**93**	**10**
No helmet	16	5	17	17	**7**	**-10**
Gender						
Male	-	-	88	92	**97**	**5**
Female	-	-	8	8	**3**	**-5**
Can't tell	-	-	5	0	**0**	**0**
Where Riding						
Road	56	65	60	54	**67**	**13**
Footpath	44	35	40	46	**33**	**-13**
Base:	***25***	***37***	***40***	***24***	***30***	

- The volume of cycle movements was low in the evening, no ten-minute intervals having more than four cyclists riding past, the only exception being of 4:40pm to 4:49pm where six cyclists were observed. Similar to the morning traffic, most of the traffic occurred during the first half of the monitoring period.

Figure 4.3: Evening Peak Cyclist Frequency

Harris/Smales Road 2009 – 2013 (n)

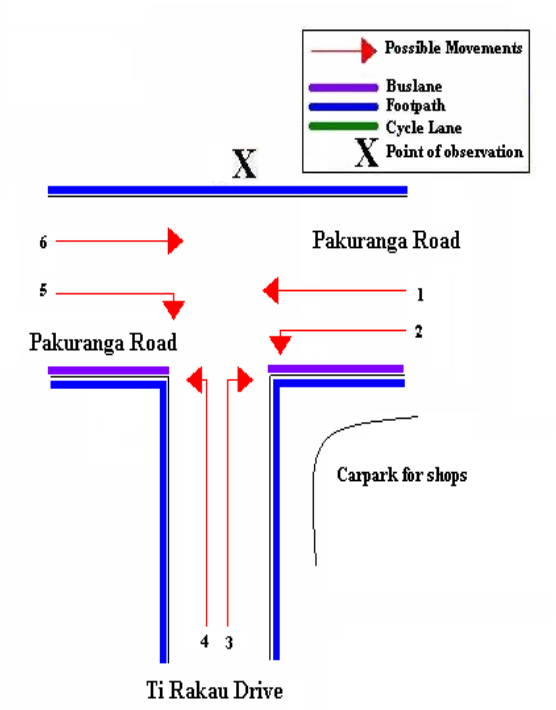


Note: A group of four cyclists (13 per cent of the evening cycle volume at this site) rode past at 4:48pm.

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
2012	51	76	127	183
2013	**55**	**79**	**134**	**193**

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 has increased by 4 movements since 2012 to a total of 55 movements this year.
- The key movements in the morning were turning right from Pakuranga Road into Ti Rakau Drive (Movement 5 = 25 movements) and riding straight along Pakuranga Road heading west (Movement 1 = 17 cyclists).
- The most notable change in cycle volumes was at Movement 5 (up 7 from 2012).

Table 5.1: Morning Cyclist Movements

Pakuranga Road/Ti Rakau Drive 2009 – 2013 (n)

Movement	2009	*2010*	*2011*	*2012*	*2013*	Change 12-13
1	10	19	17	18	17	**-1**
2	4	0	3	2	1	**-1**
3	0	0	3	1	0	**-1**
4	2	8	5	7	8	**1**
5	22	30	26	18	25	**7**
6	8	13	5	5	4	**-1**
Total	**46**	**70**	**59**	**51**	**55**	**4**

- Over the morning peak, most cyclists riding through the Pakuranga Road/Ti Rakau Drive intersection were adults (95 per cent, up slightly from 92 per cent from 2012).
- Almost all cyclists were wearing a helmet (95 per cent, stable from 94 per cent last year).
- The majority of cyclists were male (87 per cent).
- Seventy-eight per cent of cyclists were riding on the road (up 9 percentage points since 2012).

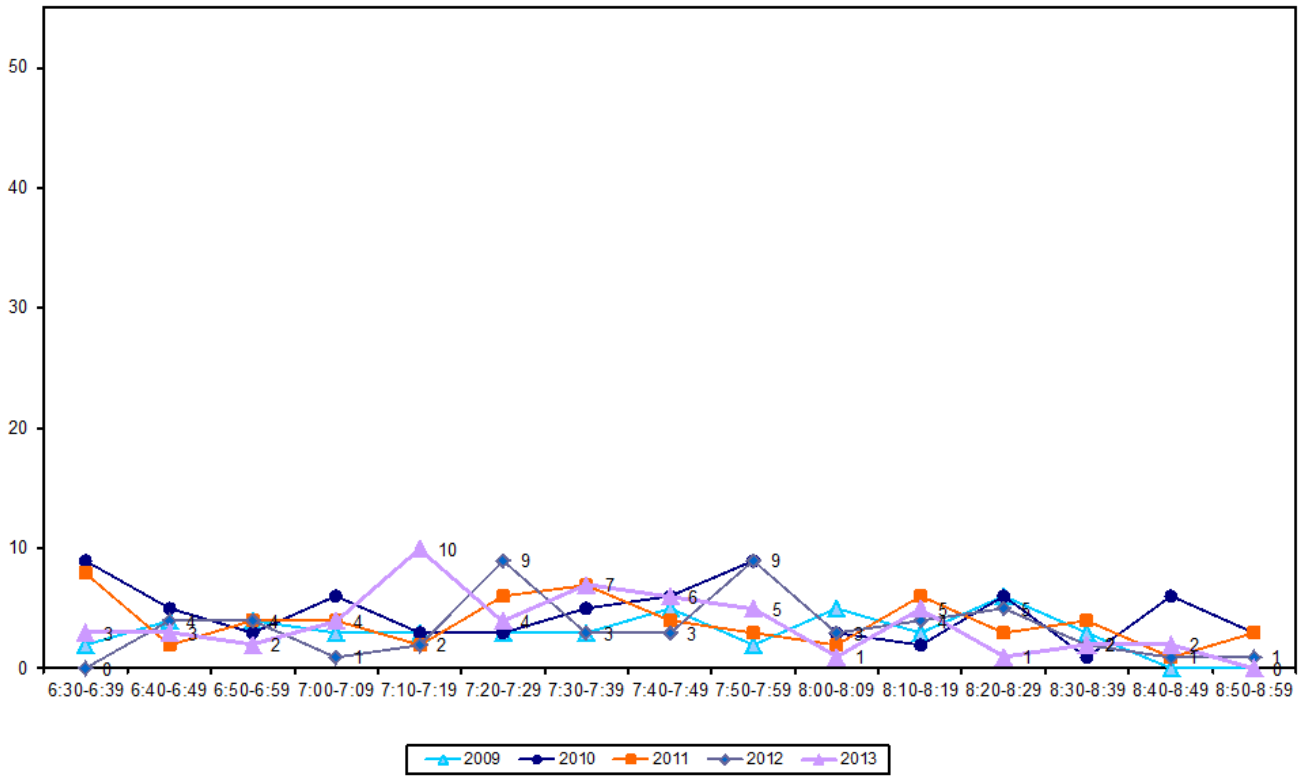
Table 5.2: Morning Cyclist Characteristics

Pakuranga Road/Ti Rakau Drive 2009 – 2013 (%)

	2009	*2010*	*2011*	*2012*	*2013*	Change 12-13
Cyclist Type						
Adult	85	96	88	92	**95**	**3**
School child	15	4	12	8	**5**	**-3**
Helmet Wearing						
Helmet on head	96	97	100	94	**95**	**1**
No helmet	4	3	0	6	**5**	**-1**
Gender						
Male	-	-	90	90	**87**	**-3**
Female	-	-	8	10	**11**	**1**
Can't tell	-	-	2	0	**2**	**2**
Where Riding						
Road	63	79	68	69	**78**	**9**
Footpath	37	21	32	31	**22**	**-9**
Base:	***46***	***70***	***59***	***51***	***55***	

- The volume of cyclist movements was variable throughout the morning monitoring period, as it had been in previous years. A peak occurred between 7:10am and 7:19am (10 movements). Traffic was the heaviest during the hour from 7:00am to 8:00am.

Figure 5.2: Morning Peak Cyclist Frequency
Pakuranga Road/Ti Rakau Drive 2009 – 2013 (n)



5.3 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 volume of evening cycle movements remained stable (79 cyclists this year, compared with 76 cyclists in 2012).
- The most common movements in the evening were the right turn from Pakuranga Road into Ti Rakau Drive (Movement 5 =25 cyclists), left turn from Ti Rakau Drive into Pakuranga Road (Movement 4 = 21) and riding straight along Pakuranga Road heading east (Movement 6 = 20 cyclists).
- Cyclist volumes at this site have changed most noticeably for Movement 5 (up 18 cyclists) and Movement 1 (down 15 cyclists).

Table 5.3: Evening Cyclist Movements

Pakuranga Road/Ti Rakau Drive 2009 – 2013 (n)

Movement	2009	*2010*	*2011*	*2012*	*2013*	Change 12-13
1	19	32	28	26	**11**	**-15**
2	1	0	3	2	**1**	**-1**
3	1	2	1	0	**1**	**1**
4	24	9	1	12	**21**	**9**
5	11	16	12	7	**25**	**18**
6	21	33	20	29	**20**	**-9**
Total	**77**	**92**	**65**	**76**	**79**	**3**

- Almost all evening cyclists using this intersection were adults (99 per cent). The share of children cycling at this site has been decreasing since 2011.
- Ninety-five per cent of cyclists were wearing a helmet.
- Almost all cyclists were male (94 per cent, stable since 2011).
- Almost three-quarters of cyclists were riding on the road (73 per cent, up from 66 per cent in 2012).

Table 5.4: Evening Cyclist Characteristics

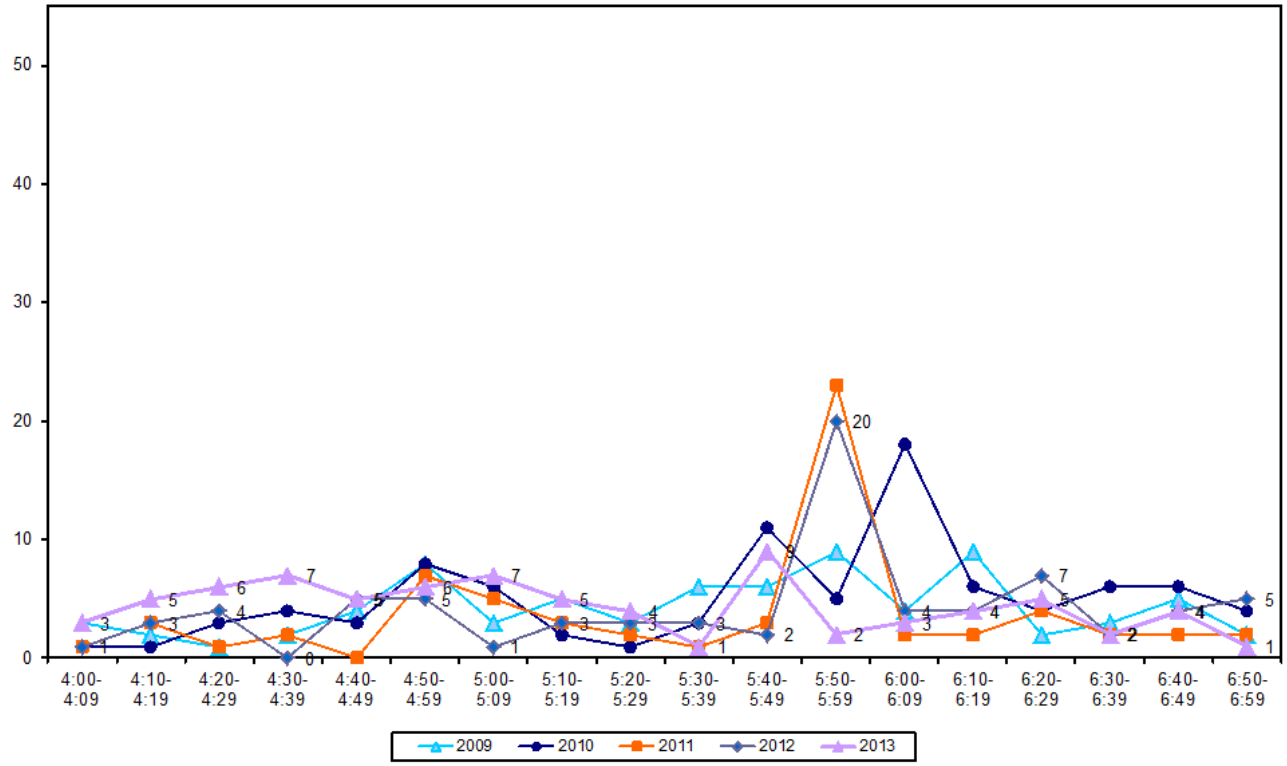
Pakuranga Road/Ti Rakau Drive 2009 – 2013 (%)

	2009	*2010*	*2011*	*2012*	*2013*	Change 12-13
Cyclist Type						
Adult	94	96	88	96	**99**	**3**
School child	6	4	12	4	**1**	**-3**
Helmet Wearing						
Helmet on head	87	98	89	93	**95**	**2**
No helmet	13	2	11	7	**5**	**-2**
Gender						
Male	-	-	92	93	**94**	**1**
Female	-	-	5	7	**5**	**-2**
Can't tell	-	-	3	0	**1**	**1**
Where Riding						
Road	65	74	62	66	**73**	**7**
Footpath	35	26	38	34	**27**	**-7**
Base:	***77***	***92***	***65***	***76***	***79***	

- The number of cyclist movements at this site peaked slightly between 4:30pm and 5:09pm (a total of 29 movements within this time frame). Cycle volumes peaked again from 5:40pm to 5:49pm (9 movements).

Figure 5.3: Evening Peak Cyclist Frequency

Pakuranga Road/Ti Rakau Drive 2009 – 2013 (n)

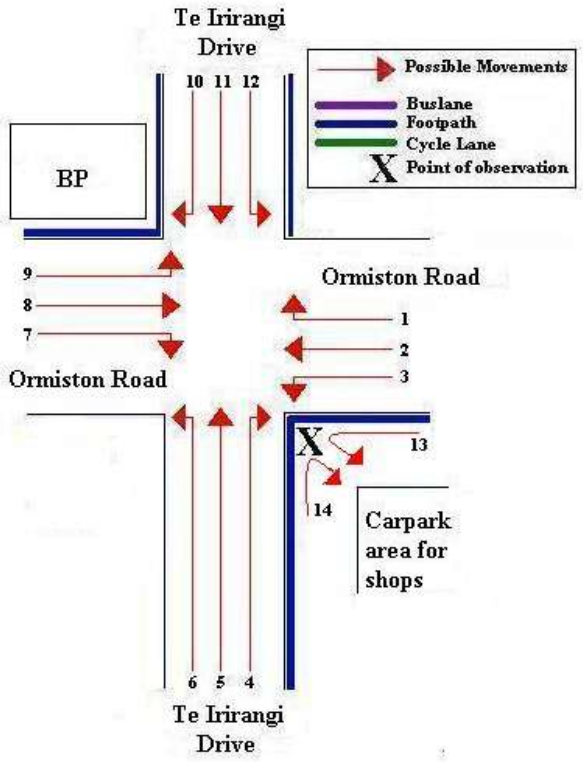


Note: A peloton of four cyclists rode past at 4:32pm. This equates to five per cent of the evening cycle movements at this site. Last year, 14 cyclists (18 per cent) were observed riding together.

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
2012	18	32	50	72
2013	**31**	**54**	**85**	**122**

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 increased this year, with 31 cycle movements recorded (up from 18 movements in 2012).
- The key movement in the morning at this site was heading south straight along Te Irirangi Drive (Movement 11 = 11 cyclists).
- Movement 11 also experienced the greatest increase in cycle volume (up 8 cyclists from last year).

Table 6.1: Morning Cyclist Movements

Te Irirangi Drive/Ormiston Road 2009 – 2013 (n)

Movement	2009	*2010*	*2011*	*2012*	*2013*	Change 12-13
1	4	1	1	4	**2**	**-2**
2	1	2	4	4	**4**	**0**
3	0	3	1	1	**1**	**0**
4	0	0	0	0	**0**	**0**
5	4	3	8	6	**5**	**-1**
6	0	0	1	0	**2**	**2**
7	0	0	0	0	**1**	**1**
8	0	3	0	0	**2**	**2**
9	0	0	0	0	**1**	**1**
10	0	1	1	0	**0**	**0**
11	4	12	8	3	**11**	**8**
12	0	0	0	0	**2**	**2**
Total	**13**	**25**	**24**	**18**	**31**	**13**

- Over the morning peak, the majority of cyclists riding through this intersection were adults (94 per cent, up from 89 per cent last year).
- The majority of cyclists were wearing a helmet (79 per cent, down slightly from 83 per cent in 2012).
- About two-thirds of the cyclists using this site (68 per cent) were male, down from 89 per cent in 2012.
- The majority of cyclists were riding on the road (65 per cent, up from 56 per cent last year).

Table 6.2: Morning Cyclist Characteristics

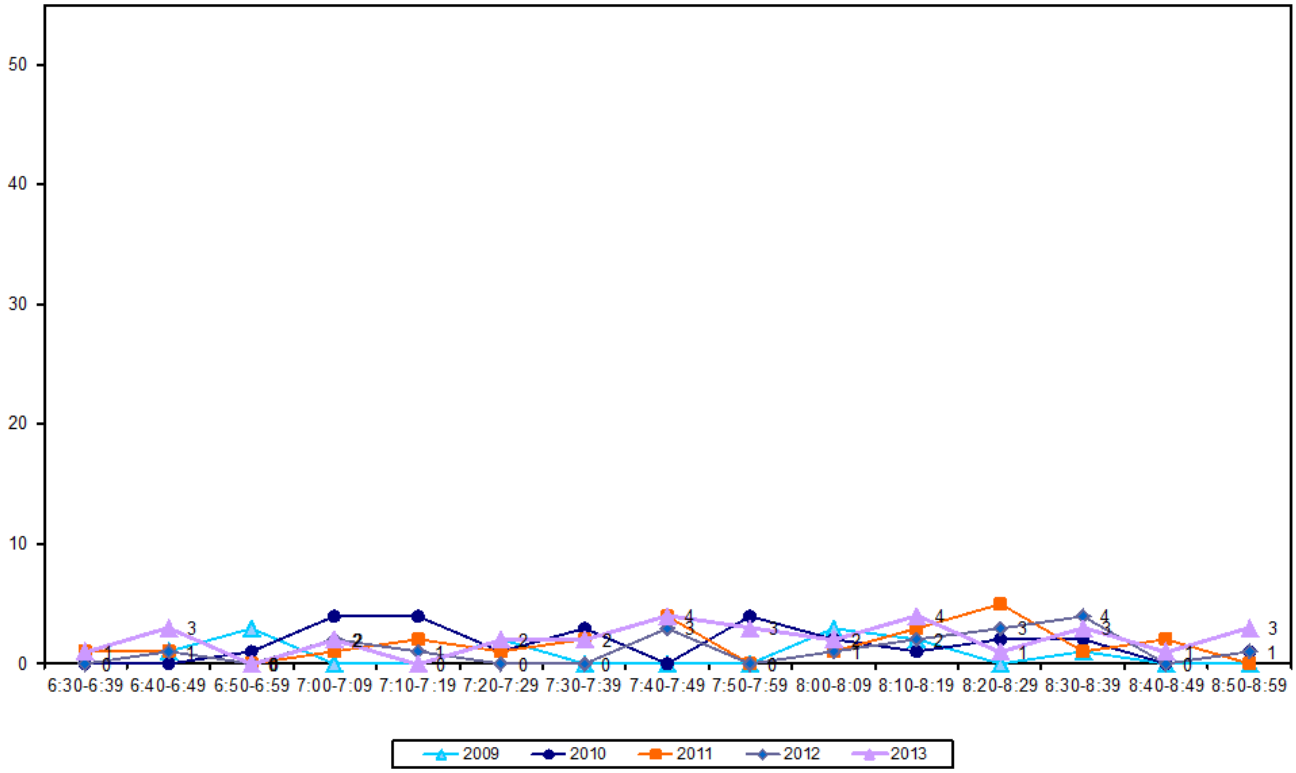
Te Irirangi Drive/Ormiston Road 2009 – 2013 (%)

	2009	*2010*	*2011*	*2012*	*2013*	Change 12-13
Cyclist Type						
Adult	69	80	83	89	**94**	**5**
School child	31	20	17	11	**6**	**-5**
Helmet Wearing						
Helmet on head	85	92	100	83	**79**	**-4**
No helmet	15	8	0	17	**21**	**4**
Gender						
Male	-	-	75	89	**68**	**21**
Female	-	-	25	11	**16**	**5**
Can't tell	-	-	0	0	**16**	**16**
Where Riding						
Road	69	64	67	56	**65**	**9**
Footpath	31	36	33	44	**35**	**-9**
Base:	***13***	***25***	***24***	***18***	***31***	

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

Figure 6.2: Morning Peak Cyclist Frequency

Te Irirangi Drive/Ormiston Road 2009 – 2013 (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 volume at the Te Irirangi Drive/Ormiston Road intersection has increased, from 32 movements in 2012 to 54 movements this year.
- The most common movement in the evening was riding straight along Te Irirangi Drive heading south (Movement 11 = 23 cyclists).
- Since 2012, evening cyclist volumes have increased most noticeably at Movement 11 (up 13 cyclists) and at Movement 5 (up 8 cyclists).

Table 6.3: Evening Cyclist Movements

Te Irirangi Drive/Ormiston Road 2009 – 2013 (n)

Movement	*2009*	*2010*	*2011*	*2012*	*2013*	Change 12-13
1	0	1	1	0	**0**	**0**
2	1	4	2	2	**3**	**1**
3	0	0	3	1	**0**	**-1**
4	0	0	1	1	**0**	**-1**
5	2	8	11	5	**13**	**8**
6	0	0	0	0	**0**	**0**
7	1	0	2	1	**2**	**1**
8	1	6	1	4	**5**	**1**
9	1	1	1	3	**4**	**1**
10	0	0	0	0	**0**	**0**
11	13	20	9	10	**23**	**13**
12	1	1	1	5	**4**	**-1**
Total	**20**	**41**	**32**	**32**	**54**	**22**

- Most evening cyclists using this site were adults (91 per cent, down from 94 per cent in 2012).
- Most cyclists were wearing a helmet (89 per cent, stable from 88 per cent last year).
- Eighty-seven per cent of cyclists at this site are male (down from 94 per cent in 2012).
- The majority of cyclists were riding on the road (78 per cent, up from 72 per cent in 2012).

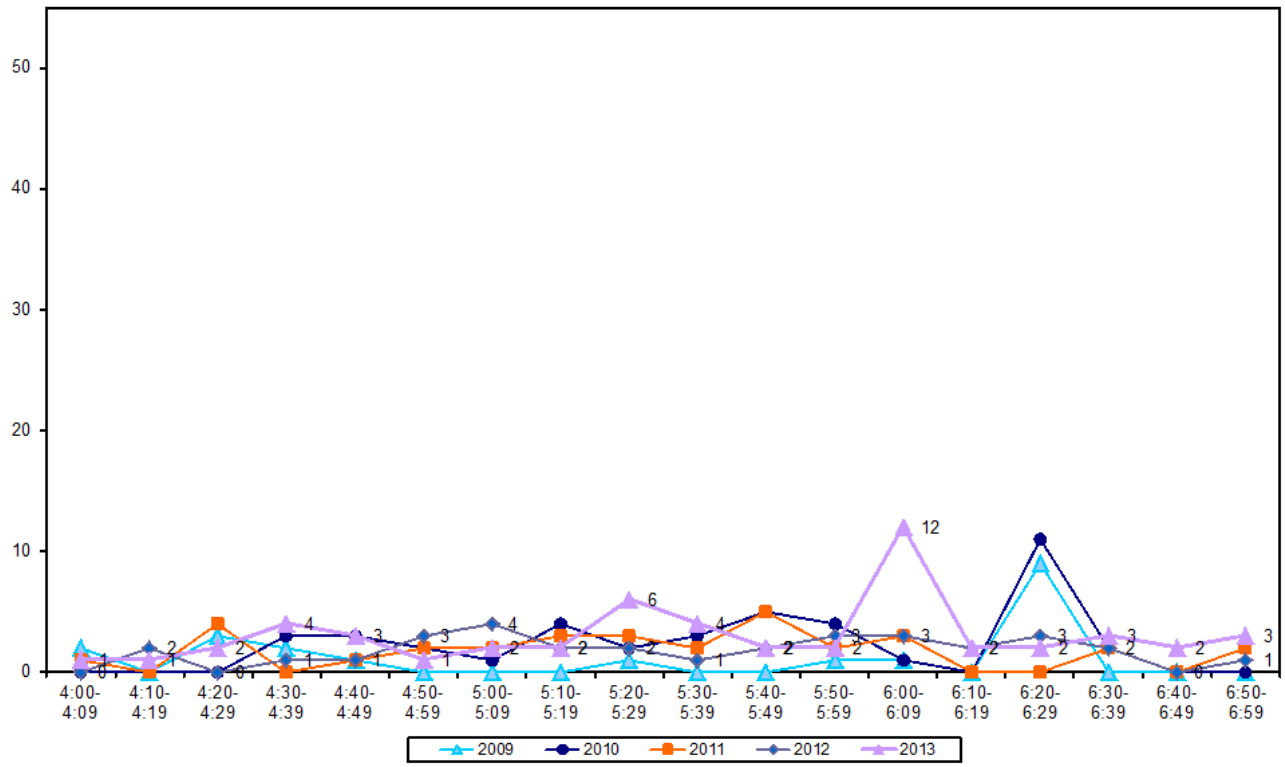
Table 6.4: Evening Cyclist Characteristics

Te Irirangi Drive/Ormiston Road 2009 – 2013 (%)

	2009	*2010*	*2011*	*2012*	*2013*	Change 12-13
Cyclist Type						
Adult	95	83	97	94	**91**	**-3**
School child	5	17	3	6	**9**	**3**
Helmet Wearing						
Helmet on head	95	78	97	88	**89**	**1**
No helmet	5	22	3	12	**11**	**-1**
Gender						
Male	-	-	78	94	**87**	**-7**
Female	-	-	16	6	**9**	**3**
Can't tell	-	-	6	0	**4**	**4**
Where Riding						
Road	95	76	88	72	**78**	**6**
Footpath	5	24	12	28	**22**	**-6**
Base:	***20***	***41***	***32***	***32***	***54***	

- Evening cyclist volumes were generally stable and low throughout the monitoring period this year, with no more than six cycle movements in any ten minute interval. However, a sharp peak was observed between 6:00pm and 6:09pm (12 movements).

Figure 6.3: Evening Peak Cyclist Frequency
Te Irirangi Drive/Ormiston Road 2009 – 2013 (n)



Note: A group of 11 cyclists (20 per cent of the evening cycle movements at this site) rode past at 6:05pm.

7. HALF MOON BAY FERRY WHARF

Key Points

- In the morning, two cycles were observed at the Half Moon Bay Ferry Wharf at 9:10am.
- In the evening, no cycles were recorded at the Half Moon Bay Ferry Wharf at either 3:30pm or 7:10pm.

Table 7.1: Half Moon Bay Ferry Wharf Cycle Counts 2010 – 2013 (n)

	2010	*2011*	*2012*	*2013*	Change 11-12
Morning Peak					
6:10am	2	0	0	**0**	**0**
9:10am	0	0	0	**2**	**2**
Evening Peak					
3:30pm	1	0	0	**0**	**0**
7:10pm	0	1	0	**0**	**0**

8. SCHOOL BIKE SHED COUNT

Background Information

- A total of 13 schools in the Howick ward participated in the school bike shed count.
- Of the schools that responded to the survey, most had no policies that restrict students cycling to school[9].
- Of the schools that responded to the survey, most did not report any events or issues that may affect cycle counts[10].
- The designated count day was Tuesday 5th of March 2013[11].

Key Points

- Among the surveyed schools, of those eligible to cycle, on average, one per cent of students are cycling to their schools. This compares to one per cent in 2012.
- Across the 13 schools that responded, 155 students were reported as cycling to school.
- This year, Farm Cove Intermediate reported the highest share of cyclists – 5 per cent of all eligible students currently cycling. This is stable from 5 per cent in 2012.
- Of the 12 schools that participated in the count in both 2012 and 2013, only one (Howick College) reported an increase in the share of students cycling to school.
- Of the 12 schools that participated in the count in both 2012 and 2013, 3 (25 per cent) reported a decrease in the share of students cycling.
- Of the 13 schools that responded, one (8 per cent) had no students cycling to school.

[9] The following schools have policies surrounding cycling to school:
- Elim Christian College *"Recommend that age 10 and above ride cycles"*
- Somerville Intermediate School *"Parents have to write a permission slip"*
- Tyndale Park Christian School *"Cycling to school is not encouraged"*

[10] The following schools reported events or issues that had an effect on the cycle count:
- Botany Downs Secondary College *"240 students from Year 9 on camp"*
- Pakuranga Intermediate School *"Year 7 boys away at softball"*

[11] The following schools conducted their counts on alternative days
- Bucklands Beach Intermediate – 13th March 2013
- Howick College – 13th March 2013
- Howick Intermediate – 13th March 2013
- Somerville Intermediate School – 14th March 2013

Table 8.1 shows the results of the 13 schools surveyed in the Howick ward.

Table 8.1: Summary Table Of School Bike Count

2007 – 2013 (n)

School Name	*School Type*	*School Roll Eligible To Cycle*	*No. of Cycles Counted*	*Cyclists as share of those eligible*[12]						
				2013	*2012*	*2011*	*2010*	*2009*	*2008*	*2007*
Farm Cove Intermediate	Intermediate	589	29	**5%**	5%	7%	7%	9%	6%	4%
Bucklands Beach Intermediate School	Intermediate	782	24	**3%**	3%	-	-	-	-	-
Elim Christian College	Intermediate/Secondary	604	14	**2%**	2%	-	-	-	-	-
Botany Downs Secondary College	Secondary	1840	34	**2%**	2%	-	-	-	-	-
Pakuranga Intermediate School	Intermediate	287	4	**1%**	3%	-	-	-	-	-
Somerville Intermediate	Intermediate	939	14	**1%**	2%	2%	3%	3%	4%	4%
Edgewater College	Secondary	815	9	**1%**	1%	2%	2%	2%	2%	-
Macleans College	Secondary	2553	15	**1%**	1%	<1%	-	2%	1%	-
Howick Intermediate	Intermediate	490	1	**<1%**	<1%	-	-	-	-	-
Sancta Maria College	Intermediate/Secondary	993	3	**<1%**	1%	1%	1%	1%	1%	2%
Howick College	Secondary	1800	2	**<1%**	0%	-	-	-	-	-
Saint Kentigern College	Intermediate/Secondary	1702	6	**0%**	-	<1%	<1%	1%	-	-
Tyndale Park Christian School	Composite	121	0	**0%**	0%	0%	0%	0%	0%	0%
Total		**13515**	**155**	**1%**	1%	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 continue to be highest among intermediate and composite schools (each 2 per cent).

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

2007 – 2013 (%)

School Type	*Number of Schools Responded in 2013 (n)*	*Cyclists as share of those eligible*							Change 12-13
		2007	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	
Intermediate	5	4%	5%	6%	6%	3%	3%	**2%**	**-1%**
Composite	2	0%	3%	4%	1%	1%	0%	**2%**	**2%**
Secondary	4	-	1%	2%	2%	1%	1%	**1%**	**0%**
Intermediate/Secondary	2	2%	1%	2%	2%	1%	1%	**<1%**	**0%**
Full Primary	-	-	-	-	-	-	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%