MONITORING REPORT

Prepared For Regional Cycle Monitoring Working Group
(Co-ordinated by Auckland Regional Transport Authority)

MANUAL CYCLE MONITORING IN THE AUCKLAND REGION

March 2010

Manukau City

Prepared by Gravitas Research and Strategy Limited

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TABLE OF CONTENTS

APPENDICES

1. MANUKAU CITY SUMMARY OF RESULTS

1.1 Introduction

The Need For Reliable Cycle Trip Data

Monitoring cycle trips and cycle traffic is important to the Auckland Regional Transport Authority (ARTA) and the local councils in the Auckland region, to identify where investment may be needed to improve infrastructure for cycling. Cycle traffic data will also help ARTA 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 councils to track progress against a quality baseline over the coming decade.

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

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. 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 14 sites across the Manukau city following a standardised methodology. Results are presented site-by-site, as well as being aggregated to a TA and region level. For sites also monitored in 2007, 2008 and/or 2009, comparative results are provided.

Important Note: This report provides the results of manual cycle monitoring conducted at 14 pre-determined sites in Manukau city only. Site-by-site results and city/district summaries for all other Auckland region Territorial Authorities 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.

[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.

1.2 Methodology

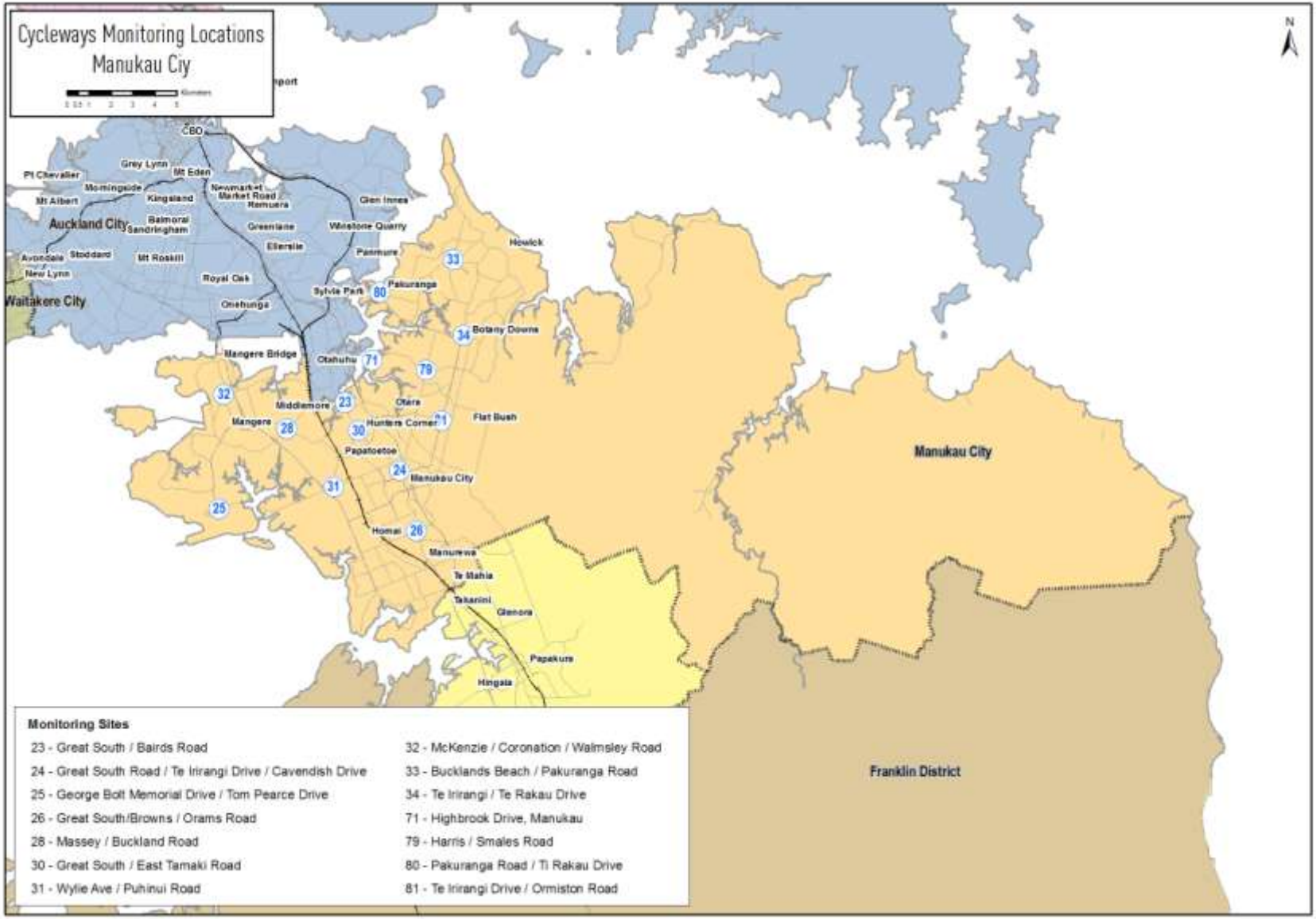
Manual cycle counts have been conducted using a standardised methodology across all sites. This methodology is outlined below. *Note: To ensure the longitudinal comparability of its cycle data, Gravitas have conducted the regional monitoring using a similar approach to that used to collect manual count data for Auckland City Council between 2001 and 2006.*

Choice Of Sites

Decisions as to which sites were chosen for cycle counts were guided by each respective TA, keeping in mind the planned developments for the Regional Cycle Network. In choosing their sites, TAs were strongly recommended to consider sites that could be retained over time as this will allow for the most accurate longitudinal assessment of change in cycle numbers.

Manual counts were undertaken at 84 different sites throughout the region. Sites were distributed throughout the region as follows:

- Auckland City — n=28 sites (12 sites monitored since 2001; 10 sites added in 2007; 5 sites added in 2008; 3 sites relocated, one site dropped and one site added in 2009, one site added in 2010)
- Waitakere City — n=15 sites (11 sites monitored since 2007; 2 sites added in 2008; 1 site added in 2009; one site relocated and one site added in 2010)
- Manukau City — n=14 sites (12 sites monitored since 2007; 1 site added in 2008; one site relocated, 2 sites dropped and 3 sites added in 2009)
- North Shore City — n=13 sites
- Rodney District — n=8 (5 sites monitored since 2007; 3 sites added in 2009)
- Franklin District — n=4 (3 sites monitored since 2007; 1 site added in 2009)
- Papakura District — n=2 sites (3 sites monitored since 2007; 1 site dropped in 2010)


Cycleways Monitoring Locations
Manukau City
N
CBD
Grey Lynn
Mt Eden
Pt Chevalier
Mornings ide
Newmarket
Market Road
Ramuera
Mt Albert
Kingsland
Glen Innes
Auckland City
Balmoral
Sandringham
Greenlane
Westfield Quarry
Ellerslie
Panmure
Howick
Avondale
Stoddard
Mt Roskill
New Lynn
Royal Oak
Pakuranga
Sylvia Park
Waitakere City
Onehunga
Botany Downs
Mangere Bridge
Otahuhu
Middlemore
Otara
Mangere
Hunters Corner
Flat Bush
Papatoetoe
Manukau City
Manukau City
Homai
Manurewa
Te Mahia
Takanini
Glenora
Papakura
Hingaia
Franklin District
Monitoring Sites
23 - Great South / Bairds Road
24 - Great South Road / Te Irirangi Drive / Cavendish Drive
25 - George Bolt Memorial Drive / Tom Pearce Drive
26 - Great South/Browns / Orams Road
28 - Massey / Buckland Road
30 - Great South / East Tamaki Road
31 - Wylie Ave / Puhinui Road
32 - McKenzie / Coronation / Walmsley Road
33 - Bucklands Beach / Pakuranga Road
34 - Te Irirangi / Te Rakau Drive
71 - Highbrook Drive, Manukau
79 - Harris / Smales Road
80 - Pakuranga Road / Ti Rakau Drive
81 - Te Irirangi Drive / Ormiston Road

Monitoring Times

Time Of Day

On the recommendation of the Regional Cycling Monitoring Working Group, manual counts in the morning peak were conducted between **6.30 and 9.00 am.** It should be noted that this is a slightly longer morning peak than was used for manual counts in Auckland city prior to 2007 – 7.00 to 9.00 am. However, to allow for longitudinal comparisons, results for Auckland city have been presented for both 7.00 to 9.00 am and 6.30 to 9.00 am.

Between 2001 and 2006, Gravitas monitored Auckland city evening cycle numbers between 4.00 and 6.00 pm. However, in 2005 and 2006, data collected at some sites had shown upwards trends and notable peaks later in the shift (particularly between 5.50 and 6.00pm) which suggested that cycle numbers after 6.00 pm may remain high or even increase. To capture this trend, Gravitas recommended extending the evening peak monitoring period to **4.00 to 7.00 pm**. Once again, to allow for longitudinal comparisons, results for Auckland city have been presented for 4.00 to 6.00 pm as well as 4.00 to 7.00 pm.

Day Of Week

Previous experience conducting cycle and other traffic manual counts on behalf of Auckland city 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 the Regional Cycle Monitoring Working Group. 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 9th of March and be conducted on the first three fine days of the 9th, 10th, 11th, 16th, 17th, or 18th of March.

Counting at sites in **North Shore and Waitakere** cities was completed on **Tuesday the 9th of March**. Counting at sites in **Auckland city** was completed on **Wednesday the 10th of March**. Counts in **Manukau, Rodney, Papakura and Franklin** were completed on **Thursday the 11th of March**. 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 (although intermittent drizzle was observed at a small number of sites). 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 2010 was as follows:

Tuesday 9th March

(Waitakere and North Shore city sites monitored)

- Sunrise: 7:13am; Sunset: 7:49pm.
- Average temperature: 19 degrees Celsius.
- Fine weather for all sites in the morning period.
- Weather fine throughout the evening shift.

Wednesday 10th March

(Auckland city sites monitored)

- Sunrise: 7:14am; Sunset: 7:48pm.
- Average temperature: 14 degrees Celsius.
- Fine weather at most sites in the morning period.

Thursday 11th March

(Manukau city and Rodney, Papakura and Franklin district sites monitored)

- Sunrise: 7:15am; Sunset: 7:46pm.
- Average temperature: 20 degrees Celsius.
- Rodney district has fine weather throughout the morning shift. Most sites had overcast weather in the morning period apart from light drizzle at two Manukau city sites, one Franklin and one Papakura site.
- Weather in the evening period was overcast, with intermittent drizzle throughout the period.

Conducting The Manual Counts

Scoping Visit

Gravitas visited each of the selected 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; Auckland city);
- Beach Road/Browns Bay Road, Mairangi Bay (Site 45; North Shore city).

Three surveyors were used at the ferry terminal site (Site 22; Auckland city).

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].

For consistency with the Auckland city cycle data collected since 2001, 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; and
- Whether cyclists are riding on the road, footpath or designated off- road cycleway[5].

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

In addition, 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

[3] This letter also contained contact details for the client organisation 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 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).

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].

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].

[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.

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

School Bike Shed Counts

As stated above, manual cycle counts were undertaken during the morning (6.30 am to 9 am) and evening (4 pm to 7 pm) 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).

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.

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 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 eg special needs schools). This sheet was designed in consultation with the Regional Cycle Monitoring Working Group to ensure all necessary information was collected.

2. This email was then sent to all intermediate, secondary and composite schools in Auckland region (n=160) 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 9th 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. One hundred and twenty-five response were received, a response rate of 78 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

For consistency with Auckland city's cycle monitor, 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
  - 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 city/district 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 TA 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 14 sites surveyed in Manukau city. 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 Manukau city, 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 Fifteen of this report.

Note: Surveying in Manukau city was undertaken on Thursday 11th March, 2010. Sunrise was at 7:15am and sunset was at 7:46pm. The average temperature was 20 degrees Celsius.

Note: To enable comparisons of sites within Manukau city, cyclist volumes at each Manukau city site are considered as:

- "high/heavy" when 39 or more cycle movements are reported;
- "moderate" when between 21 and 38 cycle movements are reported;
- "low/light" when between 0 and 20 cycle movements are reported;
- having "notably" increased/decreased if the change is more than 15% of the data being compared with;
- having "slightly" increased/decreased if the change is less than 5% of the data being compared with;
- being "stable" since last year if the change is less or equal to 3 cycle movements/percentages.

1.4 Morning Peak

Environmental Conditions

- All sites had good weather for most of the morning shift, apart from light drizzle and temporary showers at:
  - Great South/Bairds Road; and
  - McKenzie/Coronation/Walmsley Road.
- There were no road works or accidents during the morning monitoring period.

Key Points

- Across the nine sites monitored since 2007, the number of cyclist movements has increased (260 in 2010, compared with 236 in 2009). This represents a 10 per cent increase (this increase is not statistically significant – that is, the increase falls within the margin of error at the 95% confidence interval).
- A total of 412 cyclist movements were recorded across the 14 sites in the morning peak period (between 6:30am and 9:00am) in 2010. None of the total cycle movements during the morning peak were observed cycling as groups.
- The busiest site in the morning peak is the intersection of Ti Rakau Drive and Pakuranga Road (70 movements, down from 51 movements last year), whereas the site at Tom Pearce Drive/George Bolt Memorial Drive has the lowest level of morning cyclist traffic (5 cycle movements).
- Seven sites recorded increases this year compared to 2009. The most notable increases are at:
  - Wyllie Avenue/Puhinui Road – up 92 per cent;
  - Te Irirangi Drive/Ormiston Road – up 92 per cent; and
  - McKenzie/Coronation/Walmsley Road – up 73 per cent.
- In contrast, five sites recorded declines. The most notable decreases are at:
  - Harris/Smales Road – down 29 per cent; and
  - Great South/East Tamaki Road – down 24 per cent.
- The average volume of morning cyclists across the nine sites monitored since 2007 is 29 cycle movements (up from 26 cycle movements in 2009).
- The average volume of morning cyclists across all 14 sites is 29 (up from 25 last year).

Table 1.1: Summary Of Morning Cyclist Movements 2007-2010 (n)

Site Number	***Locations***	***2007***	***2008***	***2009***	***2010***	**Change 09-10**	**Change 07-10**
33	Bucklands Beach/Pakuranga Road	68	53	51	**45**	**-12%**	-34%
32	McKenzie/Coronation/Walmsley Road	28	21	22	**38**	**73%**	36%
23	Great South/Bairds Road	32	27	29	**34**	**17%**	6%
34	Te Irirangi Drive/Ti Rakau Drive	36	36	30	**30**	**0%**	-17%
24	Great South Road/Te Irirangi Dr/ Cavendish Dr	34	25	19	**28**	**47%**	-18%
30	Great South/East Tamaki Road	36	24	33	**25**	**-24%**	-31%
31	Wyllie Avenue/Puhinui Road	18	8	12	**23**	**92%**	28%
26	Great South/Browns/Orams Road	25	32	21	**21**	**0%**	-16%
28	Massey/Buckland Road	12	11	19	**16**	**-16%**	33%
	Average per site (for 9 sites since 2007)	**32**	**26**	**26**	**29**	**12%**	-9%
	Total (for 9 sites since 2007)	**289**	**237**	**236**	**260**	**10%**	-10%
80	Pakuranga Road/Ti Rakau Drive	-	-	46	**70**	**52%**	*
71	Highbrook Drive	-	13	20	**27**	**35%**	*
79	Harris/Smales Road	-	-	35	**25**	**-29%**	*
81	Te Irirangi Drive/Ormiston Road	-	-	13	**25**	**92%**	*
25	Tom Pearce/George Bolt Memorial Drive	-	-	6	**5**	**-17%**	*
	Average per site (all sites)	**-**	**-**	**25**	**29**	**16%**	*
	Total (all sites)	**-**	**-**	**356**	**412**	**16%**	*

- As shown in Table 1.2 below, morning cyclist characteristics this year are very similar to those reported in 2009. Overall, four in five cyclists are adults (88 per cent, up from 82 per cent last year). Of the 14 sites monitored, the Bucklands Beach/Pakuranga Road intersection has the greatest share of cyclists who are school children (38 per cent).
- The majority of cyclists are wearing a helmet (89 per cent, up from 85 per cent recorded in 2009). However, one in three morning cyclists at the Massey/Buckland Road site are not wearing helmets (31 per cent).
- Approximately two in three cyclists are riding on the road (65 per cent, stable from 64 per cent in 2009). The incidence of cyclists riding on the footpath is the highest at Bucklands Bucklands Beach/Pakuranga Road intersection (64 per cent).

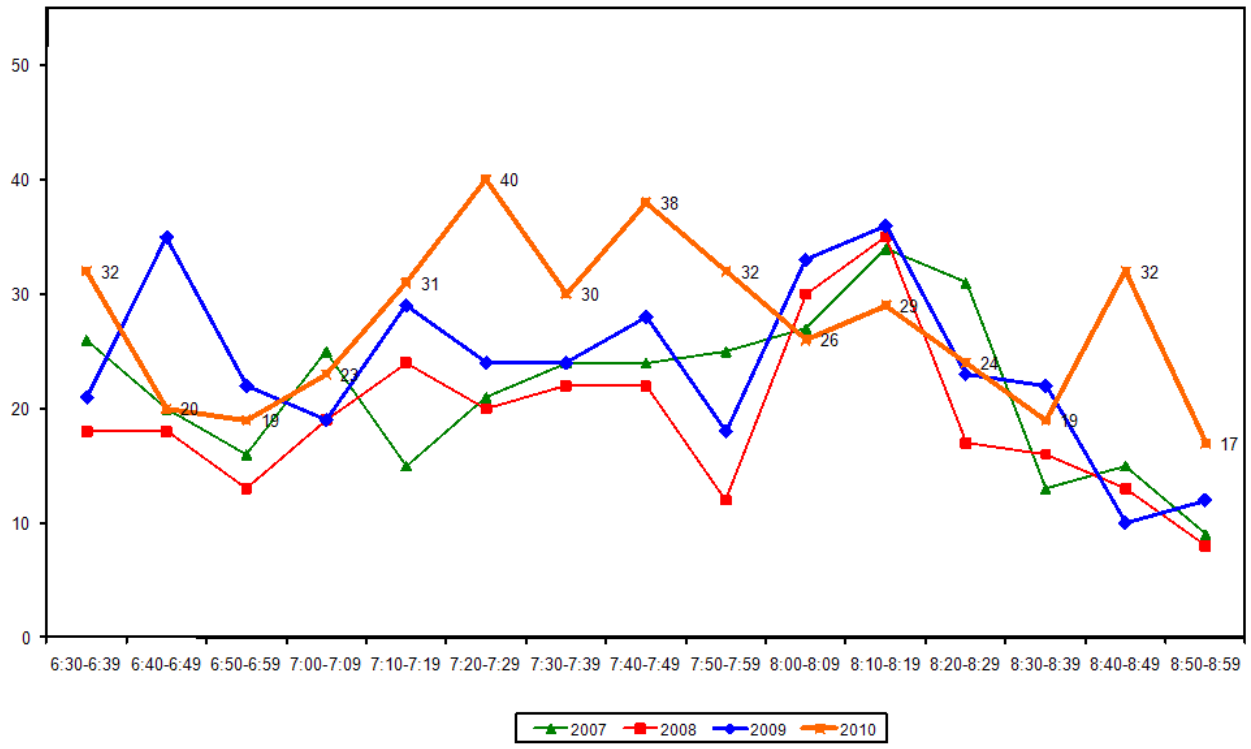
Table 1.2: Summary of Morning Cyclist Characteristics 2007-2010 (%)

	2007	*2008*	*2009*	*2010*	Change 09-10
Cyclist Type					
Adult	76%	80%	82%	**88%**	6%
School child	24%	20%	18%	**12%**	-6%
Helmet Wearing					
Helmet on head	82%	83%	85%	**89%**	4%
No helmet	18%	17%	15%	**11%**	-4%
Where Riding					
Road	57%	59%	64%	**65%**	1%
Footpath	43%	41%	32%	**31%**	-1%
Off-road cycleway[9]	-	-	4%	**4%**	0%
Base:	***325***	***287***	***356***	***412***	

[9] *In 2009, surveyors were asked to distinguish between cyclists riding on the road and cyclists riding on off-road cycleways. In previous years, all cyclists riding on both off-road cycleway and road were classified as road riders. Thus, no comparable results are provided with previous years.*

- Figure 1.1 illustrates the total number of cyclists in the morning peak by time of movement. In 2010, morning cyclists numbers peaked twice: between 7:20am and 7:29am (40 movements) and then approximately 20 minutes later between 7:40am and 7:49am (38 movements).

Figure 1.1: Total Cyclist Frequency – Morning Peak



1.5 Evening Peak

Environmental Conditions

- Most sites had light drizzle during the evening shift.
- There were no road works or accidents at most sites during the evening monitoring period. A car broke down on Miller Road between 6:35pm and 6:50pm which may have affected cycle movements at the McKenzie/Coronation/Walmsley Road Site.

Key Points

- Across the nine sites monitored since 2007, the number of cycle movements has increased by 59 per cent to 387. This increase is statistically significant – that is, the increase falls outside the margin of error at the 95% confidence interval.
- A total of 577 cyclist movements were recorded across the 14 sites in the evening peak period (between 4:00pm and 7:00pm) in 2010 (up from 404 in 2009). Seven per cent (n=40) of the total cycle movements during the evening peak were observed cycling as groups.
- Of the previously-monitored sites, the Pakuranga Road/Ti Rakau Drive intersection is the busiest in terms of the evening cyclists' activity (92 cycle movements, up notably from 77 movements last year). The intersection of Tom Pearce Drive/George Bolt Memorial Drive has the lowest level of evening cyclist traffic (7 cycle movements).
- Twelve sites recorded increases this year compared to 2009. The most notable increases are at:
  - Great South/Browns/Orams Road – up 106 per cent;
  - Te Irirangi Drive/Ormiston Road – up 105 per cent; and
  - Great South Road/Te Irirangi Dr/ Cavendish Dr – up 100 per cent.
- In contrast, two sites recorded declines:
  - Tom Pearce/George Bolt Memorial Drive – down 67 per cent; and
  - Highbrook Drive – down 28 per cent.
- The average volume of evening cyclists across the nine sites monitored since 2007 is 43 cycle movements. This compares with an average of 27 movements in 2009.
- The average volume of evening cyclists across all 14 sites is 41 (up from 29 movements last year).

Table 1.3: Summary Of Evening Cyclist Movements 2007-2010 (n)

Site Number	*Locations*	*2007*	*2008*	*2009*	*2010*	Change 08-09	Change 07-09
33	Bucklands Beach/Pakuranga Road	72	77	43	**69**	**60%**	-4%
32	McKenzie/Coronation/Walmsley Road	42	36	30	**49**	**63%**	17%
34	Te Irirangi Drive/Ti Rakau Drive	45	39	29	**48**	**66%**	7%
24	Great South Road/Te Irirangi Dr/ Cavendish Dr	39	26	22	**44**	**100%**	13%
30	Great South/East Tamaki Road	37	27	30	**40**	**33%**	8%
23	Great South/Bairds Road	36	29	28	**37**	**32%**	3%
26	Great South/Browns/Orams Road	35	23	18	**37**	**106%**	6%
31	Wyllie Avenue/Puhinui Road	20	25	23	**34**	**48%**	70%
28	Massey/Buckland Road	31	20	20	**29**	**45%**	-6%
	Average per site (for 9 sites since 2007)	**40**	**34**	**27**	**43**	**59%**	8%
	Total (for 9 sites since 2007)	**357**	**302**	**243**	**387**	**59%**	8%
80	Pakuranga Road/Ti Rakau Drive	-	-	77	**92**	**19%**	*
81	Te Irirangi Drive/Ormiston Road	-	-	20	**41**	**105%**	*
79	Harris/Smales Road	-	-	25	**37**	**48%**	*
71	Highbrook Drive	-	16	18	**13**	**-28%**	*
25	Tom Pearce/George Bolt Memorial Drive	-	-	21	**7**	**-67%**	*
	Average per site (all sites)	**-**	**-**	**29**	**41**	**41%**	*
	Total (all sites)	**-**	**-**	**404**	**577**	**43%**	*

Table 1.4 shows the percentage change in cyclist movements from morning to evening at each site monitored in Manukau city.

Note that there are three hours for the evening monitoring period compared with 2.5 hours in the morning. To enable the morning and evening cyclist volumes to be fairly compared, a scale factor has been applied so that the count numbers for both periods are based on the same length of time (2.5 hours). However, the limitation of this approach is that it does not take into account the variation in cycle movement numbers that exist over the course of a shift (as illustrated in Figures 1.1 and 1.3); rather, the number of cycle movements is assumed to be consistent throughout the monitoring period. Consequently, the results presented in Table 1.4 should be considered indicative only.

- Overall, the number of evening cycle movements across the 14 sites is 17 per cent greater than the number recorded in the morning shift.
- The number of evening cyclists recorded at 12 Manukau city sites is higher than in the morning peak. The most notable increases between morning and evening peak are reported at:
  - Massey/Buckland Road – up from 16 movements to 24 movements; and
  - Great South/Browns/Orams Road – up from 21 movements to 31 movements.

Table 1.4: Summary Of Change in Cyclist Movements from Morning to Evening 2010 (%)

Site Number	*Locations*	*AM*	*PM*[10]	Change
28	Massey/Buckland Road	16	24	**50%**
26	Great South/Browns/Orams Road	21	31	**48%**
81	Te Irirangi Drive/Ormiston Road	25	34	**36%**
34	Te Irirangi Drive/Ti Rakau Drive	30	40	**33%**
24	Great South Road/Te Irirangi Drive/Cavendish Drive	28	37	**32%**
30	Great South/East Tamaki Road	25	33	**32%**
33	Bucklands Beach/Pakuranga Road	45	58	**29%**
79	Harris/Smales Road	25	31	**24%**
31	Wyllie Avenue/Puhinui Road	23	28	**22%**
25	Tom Pearce/George Bolt Memorial Drive	5	6	**20%**
80	Pakuranga Road/Ti Rakau Drive	70	77	**10%**
32	McKenzie/Coronation/Walmsley Road	38	41	**8%**
23	Great South/Bairds Road	34	31	**-9%**
71	Highbrook Drive, Manukau	27	11	**-59%**
	Total	**412**	**482**	**17%**

[10] A scale factor of 5/6 has been applied to reduce the evening cyclist volumes to a 2.5 hour interval, consistent with the morning monitoring period.

- Evening cyclist characteristics this year are consistent with 2009. In particular, the majority evening cyclists are adults (88 per cent, stable from 89 per cent last year). Of the 14 sites monitored in Manukau city, the Massey/Buckland Road intersection has the greatest share of evening cyclists who are school children (30 per cent).
- Just over four in five cyclists are wearing a helmet (84 per cent, stable from 82 per cent in 2009). Helmet wearing is least common at both the Massey/Buckland Road intersection and Highbrook Drive (38 per cent each).
- On average, two in three evening cyclists are riding on the road (67 per cent, up slightly from 64 per cent last year). The Massey/Buckland Road site has the highest share of cyclists riding on the footpath (62 per cent).

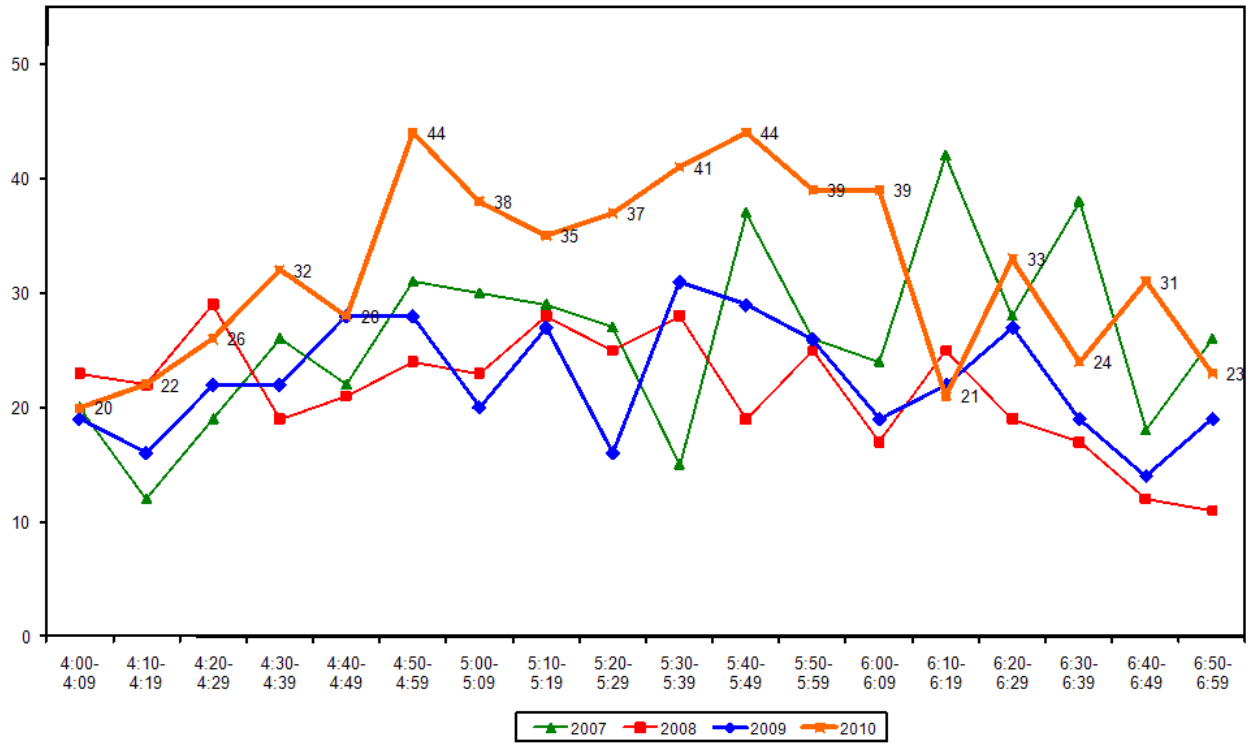
Table 1.5: Summary of Evening Cyclist Characteristics 2007-2010 (%)

	2007	*2008*	*2009*	*2010*	**Change 09-10**
Cyclist Type					
Adult	86%	81%	89%	88%	-1%
School child	14%	19%	11%	12%	1%
Helmet Wearing					
Helmet on head	79%	74%	82%	84%	2%
No helmet	21%	26%	18%	16%	-2%
Where Riding					
Road	63%	59%	64%	67%	3%
Footpath	37%	41%	33%	32%	-1%
Off-road cycleway[11]	-	-	3%	1%	-2%
Base:	***470***	***387***	***404***	***577***	

[11] *In 2009, surveyors were asked to distinguish between cyclists riding on the road and cyclists riding on off-road cycleways. In previous years, all cyclists riding on both off-road cycleway and road were classified as road riders. Thus, no comparable results are provided with previous years.*

- The overall pattern of cyclist volumes by time of movement in the evening is illustrated in Figure 1.2. Evening cyclist volumes fluctuate throughout the monitoring period, with the peak occurring between 4:50pm and 4:59pm and again between 5:40 and 5:49pm (44 movements at each site).

Figure 1.2: Total Cyclist Frequency – Evening Peak



1.6 Aggregate Total

- Across the nine sites monitored since 2007, the number of cycle movements has increased by 35 per cent to 647 - this increase is statistically significant at the 95% confidence interval.
- The number of evening cyclists comprises a slightly larger share (58 per cent) of the total number of cycle movements than morning cyclists (42 per cent).
- A total of 989 cyclist movements were recorded across the 14 sites in 2010 (up from 760 movements in 2009). Four per cent (n=40) of the total cycle movements were observed cycling as groups.
- The busiest site is the intersection of Pakuranga Road and Ti Rakau Drive with a total of 162 movements (up from 123 movements in 2009), while Tom Pearce/George Bolt Memorial Drive has the lowest number of cyclist volumes (12 movements, down from 27 movements).
- All but one of the sites have recorded increases in total cyclist numbers this year compared with 2009. The intersections with the biggest increases are:
  - Te Irirangi Drive/Ormiston Road (up 100 per cent);
  - Great South Road/Te Irirangi Dr/ Cavendish Dr (up 76 per cent);
  - McKenzie/Coronation/Walmsley Road (up 67 per cent); and
  - Wyllie Avenue/Puhinui Road (up 63 per cent).
- The only site that recorded a decline this year is Tom Pearce/George Bolt Memorial Drive (down 56 per cent from 2009).

Table 1.6: Summary Of Total Cyclist Movements 2007-2010 (n)

Site Number	*Locations*	*2007*	*2008*	*2009*	*2010*	Change 09-10	Change 07-10
33	Bucklands Beach/Pakuranga Road	140	130	94	**114**	**21%**	-19%
32	McKenzie/Coronation/Walmsley Road	70	57	52	**87**	**67%**	24%
34	Te Irirangi Drive/Ti Rakau Drive	81	75	59	**78**	**32%**	-4%
24	Great South Road/Te Irirangi Dr/ Cavendish Dr	73	51	41	**72**	**76%**	-1%
23	Great South/Bairds Road	68	56	57	**71**	**25%**	4%
30	Great South/East Tamaki Road	73	51	63	**65**	**3%**	-11%
26	Great South/Browns/Orams Road	60	55	39	**58**	**49%**	-3%
31	Wyllie Avenue/Puhinui Road	38	33	35	**57**	**63%**	50%
28	Massey/Buckland Road	43	31	39	**45**	**15%**	5%
	Total (for 9 sites since 2007)	**646**	**539**	**479**	**647**	**35%**	0%
80	Pakuranga Road/Ti Rakau Drive	-	-	123	**162**	**32%**	*
81	Te Irirangi Drive/Ormiston Road	-	-	33	**66**	**100%**	*
79	Harris/Smales Road	-	-	60	**62**	**3%**	*
71	Highbrook Drive	-	29	38	**40**	**5%**	*
25	Tom Pearce/George Bolt Memorial Drive	-	-	27	**12**	**-56%**	*
	Total (all sites)	**-**	**-**	**760**	**989**	**30%**	*

- Overall cyclist characteristics are illustrated in Table 1.7. In total, 88 per cent of cyclists are adults (stable from 86 per cent in 2008).
- Most cyclists are wearing a helmet (86 per cent, compared with 84 per cent last year).
- On average, about two in three cyclists are riding on the road (66 per cent, compared with 64 per cent in 2009).

Table 1.7: Summary of Total Cyclist Characteristics 2007-2010 (%)

	2007	*2008*	*2009*	*2010*	Change 09-10
Cyclist Type					
Adult	82%	81%	86%	88%	2%
School child	18%	19%	14%	12%	-2%
Helmet Wearing					
Helmet on head	80%	78%	84%	86%	2%
No helmet	20%	22%	16%	14%	-2%
Where Riding					
Road	61%	59%	64%	66%	2%
Footpath	39%	41%	33%	32%	-1%
Off-road cycleway[12]	-	-	3%	2%	-1%
Base:	***795***	***674***	***760***	***989***	

[12] *In 2009, surveyors were asked to distinguish between cyclists riding on the road and cyclists riding on off-road cycleways. In previous years, all cyclists riding on both off-road cycleway and road were classified as road riders. Thus, no comparable results are provided with previous years.*

1.7 Average Annual Daily Traffic (AADT) Estimate

AADT Estimate

- Table 1.8 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 (234 daily movements) and the lowest is at Tom Pearce/George Bolt Memorial Drive (17 daily movements).
- All but one site also monitored in 2009 have recorded increases in total AADT estimates this year, the most notable increases being:
  - Te Irirangi Drive/Ormiston Road (up 102 per cent);
  - Great South Road/Te Irirangi Dr/ Cavendish Dr (up 75 per cent);
  - McKenzie/Coronation/Walmsley Road (up 68 per cent); and
  - Wyllie Avenue/Puhinui Road (up 64 per cent).
- The only site that recorded a decline this year is Tom Pearce/George Bolt Memorial Drive (down 55 per cent from 2009).

Table 1.8: AADT Estimates Based on Morning and Evening Cyclist Movements 2007-2010 (n)

Site Number	*Locations*	*2007 AADT*	*2008 AADT*	*2009 AADT*	*2010 AADT*	Change 09-10	Change 07-10
80	Pakuranga Road/Ti Rakau Drive	-	-	176	**234**	**33%**	-
33	Bucklands Beach/Pakuranga Road	203	187	137	**164**	**20%**	-19%
32	McKenzie/Coronation/Walmsley Road	101	82	75	**126**	**68%**	25%
34	Te Irirangi Drive/Ti Rakau Drive	117	109	86	**112**	**30%**	-4%
23	Great South/Bairds Road	99	81	83	**103**	**24%**	4%
24	Great South Road/Te Irirangi Drive/Cavendish Drive	106	74	59	**103**	**75%**	-3%
81	Te Irirangi Drive/Ormiston Road	-	-	47	**95**	**102%**	-
30	Great South/East Tamaki Road	106	74	92	**93**	**1%**	-12%
79	Harris/Smales Road	-	-	88	**89**	**1%**	-
26	Great South/Browns/Orams Road	86	81	57	**83**	**46%**	-3%
31	Wyllie Avenue/Puhinui Road	55	47	50	**82**	**64%**	49%
28	Massey/Buckland Road	61	44	57	**64**	**12%**	5%
71	Highbrook Drive	-	42	55	**59**	**7%**	-
25	Tom Pearce/George Bolt Memorial Drive	-	-	38	**17**	**-55%**	-

1.8 Ferry Wharf Bike Count Summary

Key Points

- In the morning, 2 cycles were observed at the Half Moon Bay Ferry Wharf at 6.10am whereas no cycles were observed at 9.10am.
- In the afternoon, one cycle was recorded at the Half Moon Bay Ferry Wharf at 3.30pm while no cycles were observed at 7.10pm.
- Four cycles were recorded at the Pine Harbour Ferry Wharf at 10am.

1.9 School Bike Shed Count Summary

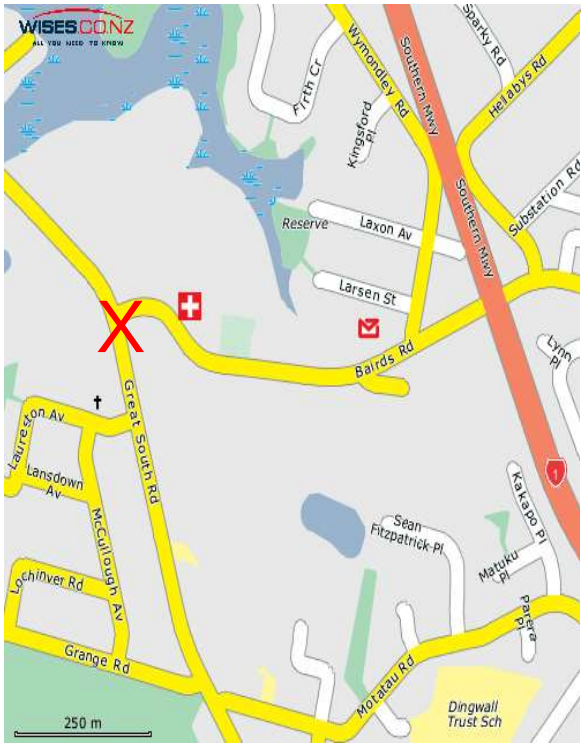
Key Points

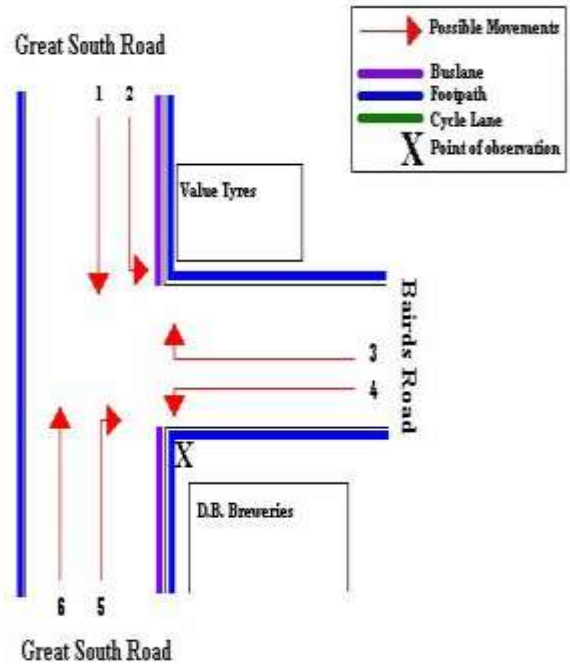
- Among the surveyed schools, of those eligible to cycle at school, on average, one per cent of students are cycling to their schools. This is unchanged from both 2008 and 2009.
- Across the 30 schools that responded, 304 students were reported to cycle to school.
- This year, Bucklands Beach Intermediate reported the highest share of cyclists – 9 per cent of all eligible students currently cycling. This is up from 5 per cent in 2009.
- Of the 30 schools that responded, 12 (40 per cent) had no students cycling to school. This compares with 19 per cent in 2009.
- Rates of cycling to school are highest among intermediate schools (3 per cent, unchanged from last year) and lowest for composite and combined intermediate and secondary schools (less than 1 per cent, down from 1 per cent in 2009).

2. GREAT SOUTH ROAD/BAIRDS ROAD, OTARA (SITE 23)

Figure 2.1 shows the possible cyclist movements at this intersection.

Figure 2.1: Cycle Movements: Great South/Bairds Road





AADT Estimate

- The AADT for this site is 103. This compares with:
  - 83 in 2009
  - 81 in 2008
  - 99 in 2007.
  -

	AM	PM	TOTAL
Raw Cycle Movement Counts 2010	**34**	**37**	**71**

2.1 Morning Peak

Environmental Conditions

- The weather was cloudy with light drizzle between 6:20am and 6:40am, clearing to sunshine towards the end of the monitoring period.
- There were no road works or accidents that may affect cycle counts.

Key Points

- Compared with last year, the volume of morning cyclists at the Great South/Bairds Road intersection has increased, from 29 movements in 2009 to 34 movements this year.
- The most common movement in the morning is straight along Great South Road heading north (Movement 6 = 10 cyclists, down slightly from 11 in 2009).
- Across the six movements possible at this intersection, there have been no notable changes from the number of cyclists recorded in 2009.

Table 2.1: Morning Cyclist Movements
Great South/Bairds Road 2007-2010 (n)

Movement	*2007*	*2008*	*2009*	2010	Change 09-10
1	5	7	5	5	0
2	7	3	4	7	3
3	4	4	3	6	3
4	0	1	3	0	-3
5	0	1	3	6	3
6	16	11	11	10	-1
Total	**32**	**27**	**29**	**34**	**5**

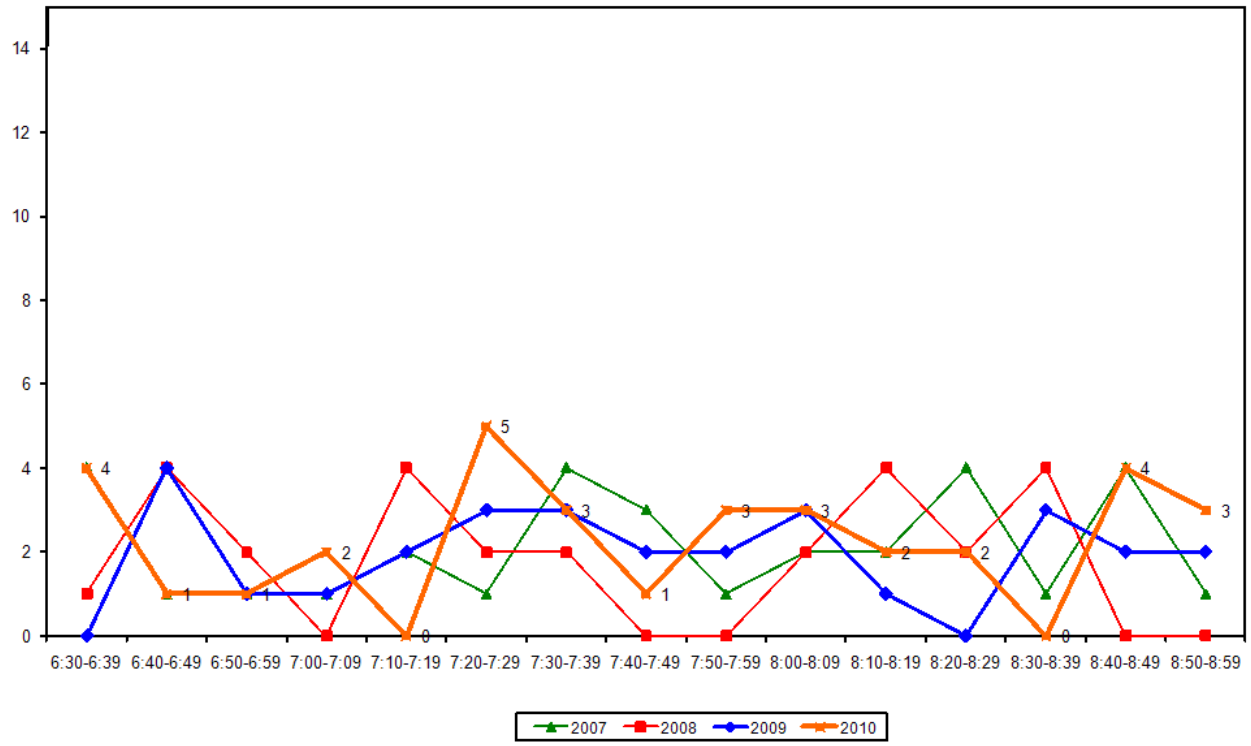
- Over the morning peak, almost all cyclists using the Great South/Bairds Road intersection are adults (97 per cent, up from 90 per cent last year).
- Most cyclists are wearing a helmet (94 per cent, up from 83 per cent in 2009).
- Just over three-quarters of cyclists are riding on the road (76 per cent, up from 69 per cent last year).

Table 2.2: Morning Cyclist Characteristics
Great South/Bairds Road 2007-2010 (%)

	2007	*2008*	*2009*	2010	Change 09-10
Cyclist Type					
Adult	100	89	90	97	7
School child	0	11	10	3	-7
Helmet Wearing					
Helmet on head	91	67	83	94	11
No helmet	9	33	17	6	-11
Where Riding					
Road	72	63	69	76	7
Footpath	28	37	31	24	-7
Base:	***32***	***27***	***29***	***34***	

- The volume of morning cycle movements is quite variable throughout the morning monitoring period. The cyclist movement volume peaks slightly between 6:30am and 6:39am (4 cyclists), 7:20am and 7:29am (5 cyclists) and between 8:40am and 8:49am (4 cyclists). This compares to a slight peak (4 cyclists at around 6:40am) and a slight drop in cyclist numbers between 8:10am and 8:29am (with 1 cyclist and no cyclists in each ten minute interval respectively) in 2009.

Figure 2.2: Great South/Bairds Road Cyclist Frequency – Morning Peak



2.2 Evening Peak

Environmental Conditions

- The weather was fine at the start of the monitoring period turning to light drizzle at 4:20pm and rain towards the end of the period.
- There were no road works or accidents that may affect cycle counts.

Key Points

- In the evening, the total number of cycle movements recorded at the Great South/Bairds Road intersection has increased, with 37 movements this year compared with 28 in 2009.
- As in the past three years, the key evening movement is straight along Great South Road heading south (Movement 1 = 16 cyclists).
- Evening cyclist volumes at all movements remain relatively stable since last year, with change most notable at Movement 1 (up 6 cyclists).

Table 2.3: Evening Cyclist Movements
Great South/Bairds Road 2007-2010 (n)

Movement	*2007*	*2008*	*2009*	2010	Change 09-10
1	17	14	10	16	6
2	5	5	3	6	3
3	5	1	6	4	-2
4	1	2	3	6	3
5	1	0	2	1	-1
6	7	7	4	4	0
Total	**36**	**29**	**28**	**37**	**9**

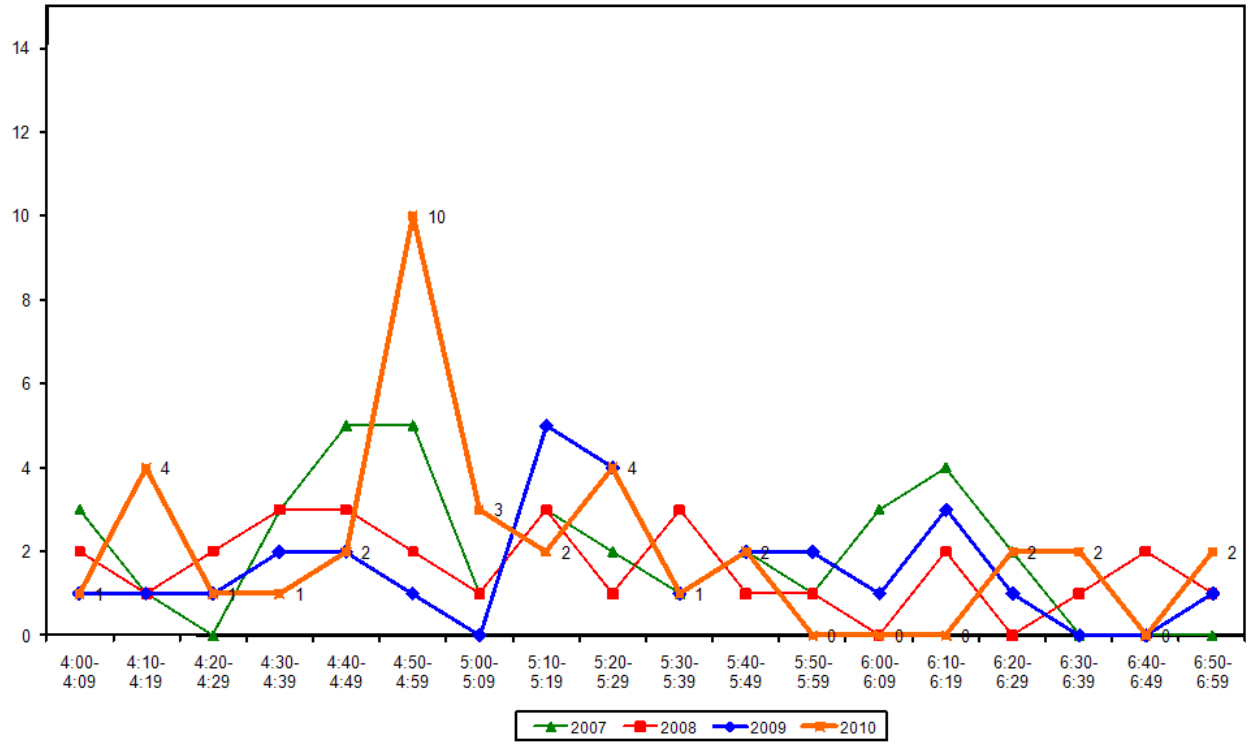
- All cyclists using this intersection during the evening period are adults (100 per cent, up from 93 per cent the previous year).
- Ninety-two per cent of cyclists at this site are wearing a helmet (up notably from 79 per cent in 2009).
- Eighty-six per cent of all cyclists are riding on the road (up notably from 54 per cent last year).

Table 2.4: Evening Cyclist Characteristics
Great South/Bairds Road 2007-2010 (%)

	2007	*2008*	*2009*	2010	Change 09-10
Cyclist Type					
Adult	100	93	93	100	7
School child	0	7	7	0	-7
Helmet Wearing					
Helmet on head	86	66	79	92	13
No helmet	14	34	21	8	-13
Where Riding					
Road	67	72	54	86	32
Footpath	33	28	46	14	-32
Base:	***36***	***29***	***28***	***37***	

- Compared with last year, the volume of cycle movements in the evening is more variable. A large peak occurs between 4:50pm and 4:59pm (10 cyclists). This compares with two peaks which occurred between 5:10pm and 5:19pm and 6:10pm and 6:19pm in 2009.

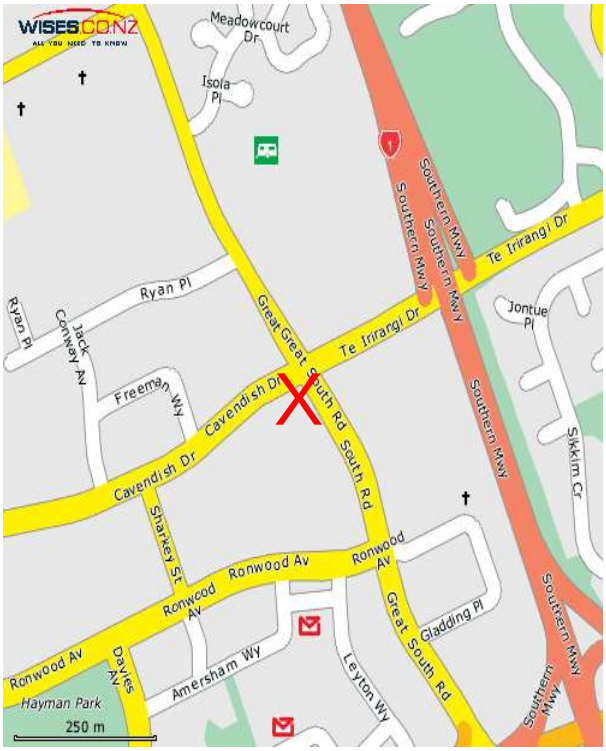
Figure 2.3: Great South/Bairds Road Cyclist Frequency – Evening Peak

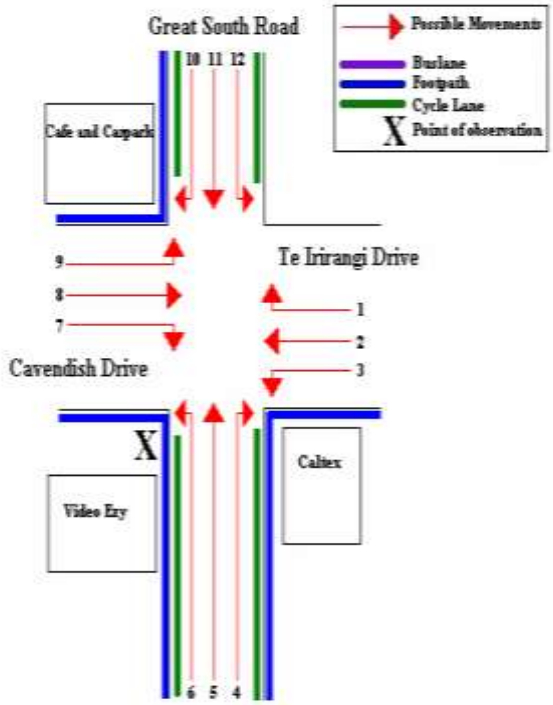


3. GREAT SOUTH ROAD/TE IRIRANGI DRIVE/CAVENDISH DRIVE, MANUKAU (SITE 24)

Figure 3.1 shows the possible cyclist movements at this intersection.

Figure 3.1: Cycle Movements: Great South Road/Te Irirangi Drive





AADT Estimate

- The AADT for this site is 103. This compares with:
  - 59 in 2009
  - 74 in 2008
  - 106 in 2007.
  -

	AM	PM	TOTAL
Raw Cycle Movement Counts 2010	**28**	**44**	**72**

3.1 Morning Peak

Environmental Conditions

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

Key Points

- The volume of morning cyclists at the intersection of Great South Road and Te Irirangi Drive is up from 19 in 2009 to 28 movements this year.
- The key morning movement is straight through Irirangi Drive into Cavendish Drive (Movement 2 = 10 cyclists).
- Morning cyclist volumes at almost all movements at this intersection are fairly stable since last year. The most notable change is an increase at Movement 2 (up 5 cyclists).

Table 3.1: Morning Cyclist Movements

Great South Road/Te Irirangi Drive 2007-2010 (n)

Movement	*2007*	*2008*	*2009*	*2010*	Change 09-10
1	1	1	0	2	2
2	6	2	5	10	5
3	1	3	0	1	1
4	1	2	2	1	-1
5	13	8	7	7	0
6	0	0	1	1	0
7	1	0	0	0	0
8	1	1	0	2	2
9	2	0	0	0	0
10	1	0	1	2	1
11	7	8	2	1	-1
12	1	0	1	1	0
Total	**34**	**25**	**19**	**28**	**9**

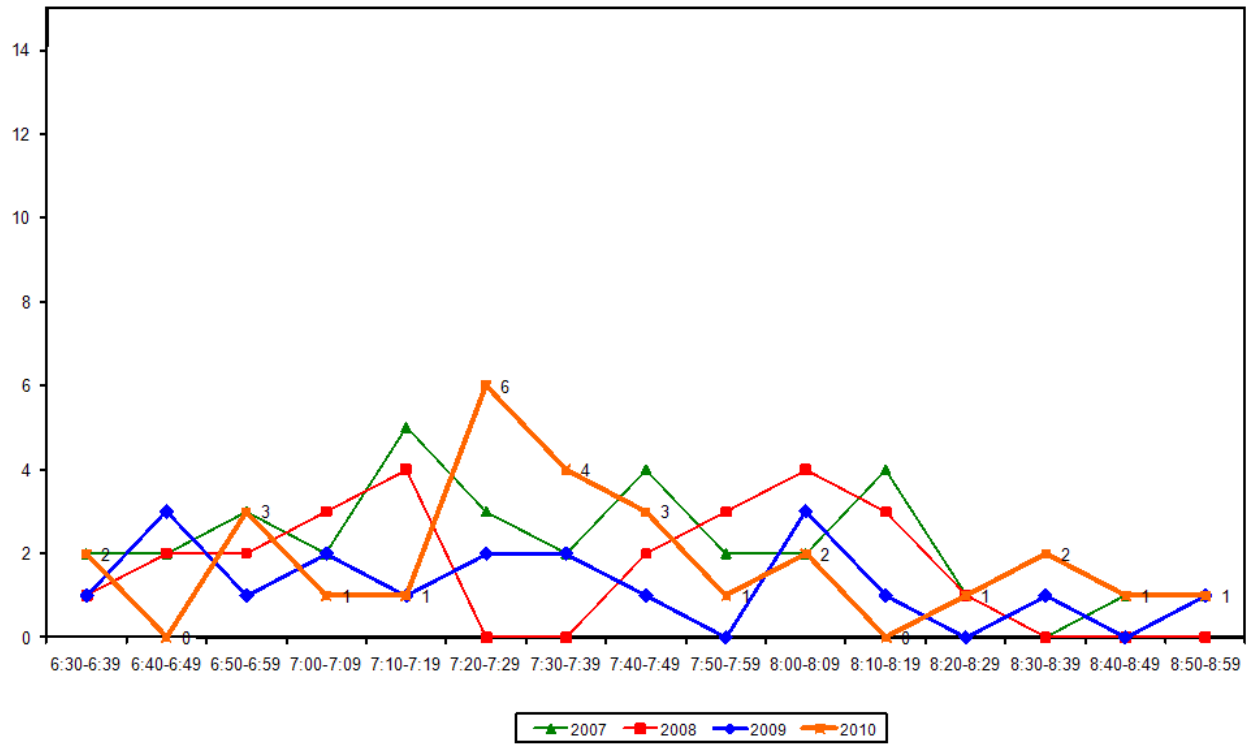
- Over the morning peak, almost all cyclists using this intersection are adults (96 per cent, down from 100 per cent in 2009).
- Most cyclists are wearing helmets (93 per cent, down from 100 per cent last year).
- Three-quarters of morning peak cyclists (75 per cent) continue to cycle on the road (down from 79 per cent last year).

Table 3.2: Morning Cyclist Characteristics
Great South Road/Te Irirangi Drive 2007-2010 (%)

	2007	*2008*	*2009*	*2010*	Change 09-10
Cyclist Type					
Adult	100	76	100	96	-4
School child	0	24	0	4	4
Helmet Wearing					
Helmet on head	85	96	100	93	-7
No helmet	15	4	0	7	7
Where Riding					
Road	85	76	79	75	-4
Footpath	15	24	21	25	4
Base:	***34***	***25***	***19***	***28***	

- The volume of morning cycle movements peaks between 7:20am and 7:29am (6 cyclists) and trails off to the end of the monitoring period. This compares with 2009 where cyclist volumes peaked slightly between 6:40am and 6:49am (3 cyclists) and again between 8:00am and 8:09am (3 cyclists).

Figure 3.2: Great South Road/Te Irirangi Drive Cyclist Frequency – Morning Peak



3.2 Evening Peak

Environmental Conditions

- The weather was fine at the start evening shift, with drizzle developing from 5:35pm and becoming heavy towards the end of the monitoring period.
- There were no road works or accidents that may affect cycle counts.

Key Points

- In 2010, the total number of evening cycle movements observed at the Great South Road/Te Irirangi Drive intersection has notably increased, from 22 in 2009 to 44 movements this year.
- As in the previous three years, the key evening movement at this site is straight along Great South Road heading south (Movement 11 = 18 cyclists).
- The most notable increase is reported at Movement 11 (up 11 cyclists).

Table 3.3: Evening Cyclist Movements

Great South Road/Te Irirangi Drive 2007-2010 (n)

Movement	*2007*	*2008*	*2009*	*2010*	Change 09-10
1	0	5	0	1	1
2	3	1	3	4	1
3	1	0	2	0	-2
4	2	2	2	2	0
5	5	6	2	4	2
6	5	0	2	2	0
7	1	1	0	0	0
8	3	0	1	5	4
9	1	0	1	5	4
10	2	0	2	2	0
11	15	9	7	18	11
12	1	2	0	1	1
Total	**39**	**26**	**22**	**44**	**22**

- Over the evening peak, almost all of cyclists using the Great South Road/Te Irirangi Drive intersection are adults (95 per cent, up notably from 73 per cent in 2009).
- Three-quarters of cyclists at this site are wearing a helmet (77 per cent, up from 68 per cent last year).
- The share of evening peak cyclists riding on the road remains unchanged from the last monitoring period at 73 per cent.

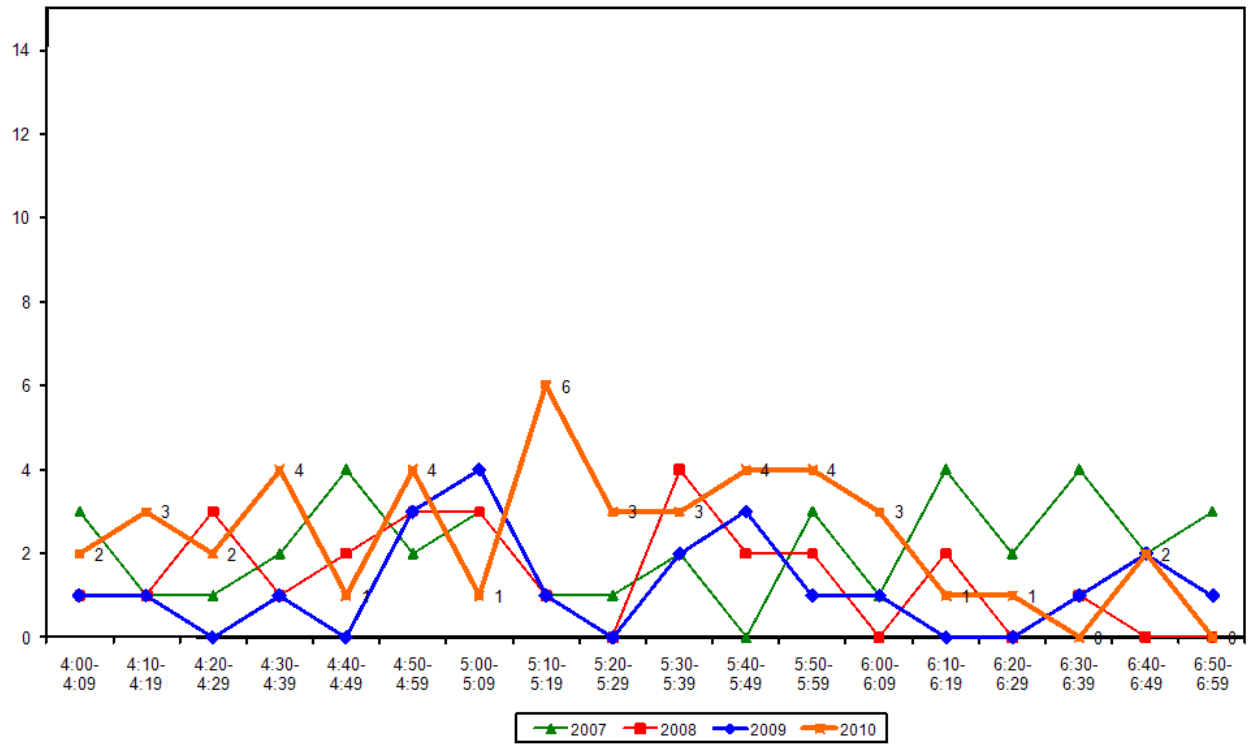
Table 3.4: Evening Cyclist Characteristics

Great South Road/Te Irirangi Drive 2007-2010 (%)

	2007	*2008*	*2009*	*2010*	Change 09-10
Cyclist Type					
Adult	95	88	73	95	22
School child	5	12	27	5	-22
Helmet Wearing					
Helmet on head	97	88	68	77	9
No helmet	3	12	32	23	-9
Where Riding					
Road	79	92	73	73	0
Footpath	21	8	27	27	0
Base:	***39***	***26***	***22***	***44***	

- This year, the volume of evening cyclists peaks between 5:10pm and 5:19pm (6 cyclists), ten minutes later than last year.

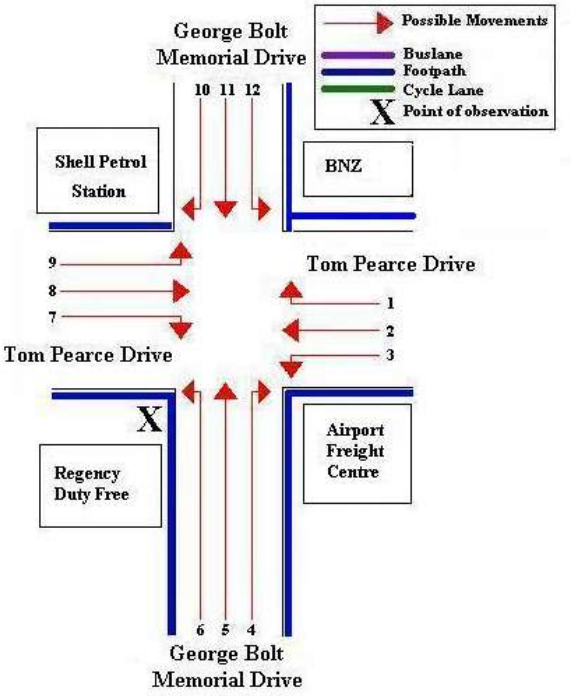
Figure 3.3: Great South Road/Te Irirangi Drive Cyclist Frequency – Evening Peak



4. TOM PEARCE/GEORGE BOLT MEMORIAL DRIVE, MANGERE (SITE 25)

Figure 4.1 shows the possible cyclist movements at this intersection.

Figure 4.1: Cycle Movements: Tom Pearce/George Bolt Memorial Drive



AADT Estimate

- The AADT for this site is 17. This compares with 38 in 2009.
-

	AM	*PM*	*TOTAL*
Raw Cycle Movement Counts 2010	**5**	**7**	**12**

4.1 Morning Peak

Environmental Conditions

- The weather was cloudy throughout the morning monitoring period with light drizzle between 6:59am and 7:05am.
- There were no road works or accidents that may affect cycle counts.

Key Points

- The intersection of George Bolt Memorial Drive and Tom Pearce Drive has the lowest volume of morning cyclists' traffic in Manukau city, with 5 cycle movements recorded over the monitoring period.
- The key movement in the morning is coming from the east along Tom Pearce Drive and turning right into George Bolt Memorial Drive (Movement 1 = 3 cyclists).
- The number of cyclist movements recorded in 2010 are similar to those recorded in 2009.

Table 4.1: Morning Cyclist Movements

Tom Pearce/George Bolt Memorial Drive 2009 - 2010 (n)

Movement	2009	2010	Change 09-10
1	3	3	0
2	0	0	0
3	0	1	1
4	0	0	0
5	1	0	-1
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	2	1	-1
Total	**6**	**5**	**-1**

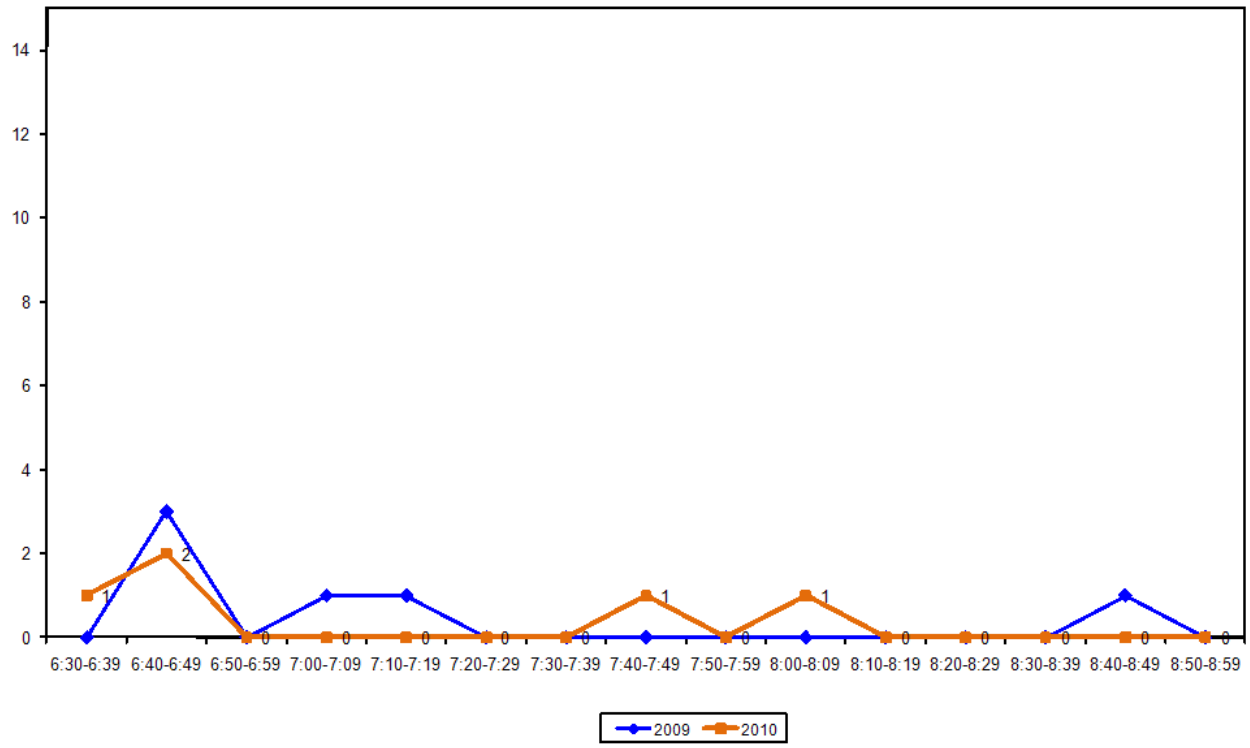
- Over the morning peak, no school children are riding through the Tom Pearce/George Bolt Memorial Drive intersection, consistent with last year's monitoring results.
- All cyclists are wearing a helmet, as was found in the 2009 monitoring.
- All cyclists are riding on the road, consistent with the results of the 2009 monitoring.

Table 4.2: Morning Cyclist Characteristics
Tom Pearce/George Bolt Memorial Drive 2009 - 2010 (%)

	2009	2010	Change 09-10
Cyclist Type			
Adult	100	100	0
School child	0	0	0
Helmet Wearing			
Helmet on head	100	100	0
No helmet	0	0	0
Where Riding			
Road	100	100	0
Footpath	0	0	0
Base:	***6***	***5***	

- The volume of morning cycle movements is relatively low over the entire monitoring period, with no more than one cyclist recorded passing during most ten minute intervals. A slight peak (2 cyclists) occurs between 6:40am and 6:49am, matching the peak of 2009.

Figure 4.2: Tom Pearce/George Bolt Memorial Drive Cyclist Frequency – Morning Peak



4.2 Evening Peak

Environmental Conditions

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

Key Points

- Evening cyclist volumes at Tom Pearce/George Bolt Memorial Drive intersection are low when compared with other Manukau city sites, with 7 cyclists recorded over the monitoring period.
- The most common movement in the evening is heading north up George Bolt Memorial Drive (Movement 5 = 3 cyclists).
- The most noticeable decrease in cyclist volume is Movement 5 (down to 3 cyclists from 13 in 2009). *Note: it was reported that nine of the cyclists making this Movement in 2009 were riding together as a group.*

Table 4.3: Evening Cyclist Movements

Tom Pearce/George Bolt Memorial Drive 2009 – 2010 (n)

Movement	2009	2010	Change 09-10
1	4	1	-3
2	0	0	0
3	1	1	0
4	0	0	0
5	13	3	-10
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	3	2	-1
Total	**21**	**7**	**-14**

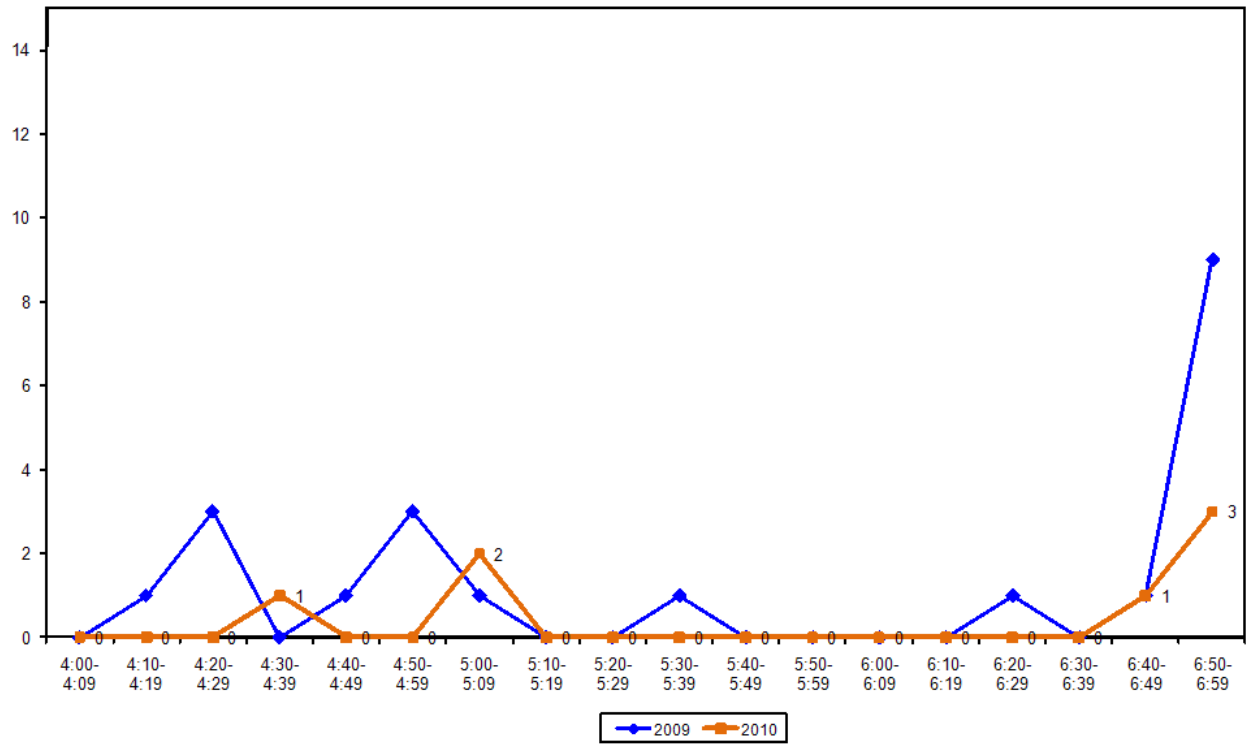
- All cyclists using this site are adults (100 per cent), consistent with the results of the 2009 monitoring.
- All cyclists are wearing a helmet (100 per cent), as was found in the 2009 monitoring.
- All cyclists are riding on the road (100 per cent), consistent with last years monitoring results.

Table 4.4: Evening Cyclist Characteristics
Tom Pearce/George Bolt Memorial Drive 2009 – 2010 (%)

	2009	2010	Change 09-10
Cyclist Type			
Adult	100	100	0
School child	0	0	0
Helmet Wearing			
Helmet on head	100	100	0
No helmet	0	0	0
Where Riding			
Road	100	100	0
Footpath	0	0	0
Base:	***21***	***7***	

- Cyclist numbers are low during the entire evening shift. Two small peaks are evident between 5:00pm and 5:09pm (2 cyclists) and again at the end of the monitoring period between 6:50pm and 6:59pm (3 cyclists). This compares with two small peaks between 4:20pm and 4:29pm (3 cyclists) and again half an hour later between 4:50pm and 4:59pm (3 cyclists) and a sharp notable peak between 6:50pm and 6:59pm (9 cyclists; noted to be travelling together in a group) in 2009.

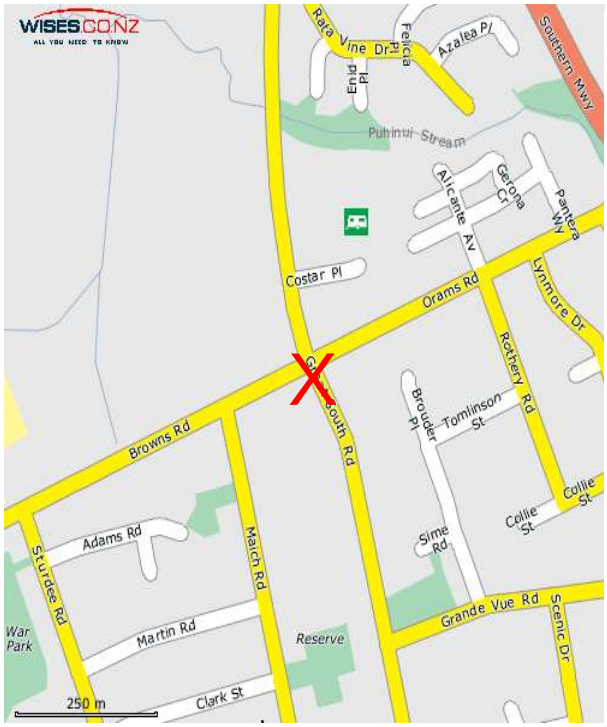
Figure 4.3: Tom Pearce/George Bolt Memorial Drive Cyclist Frequency – Evening Peak

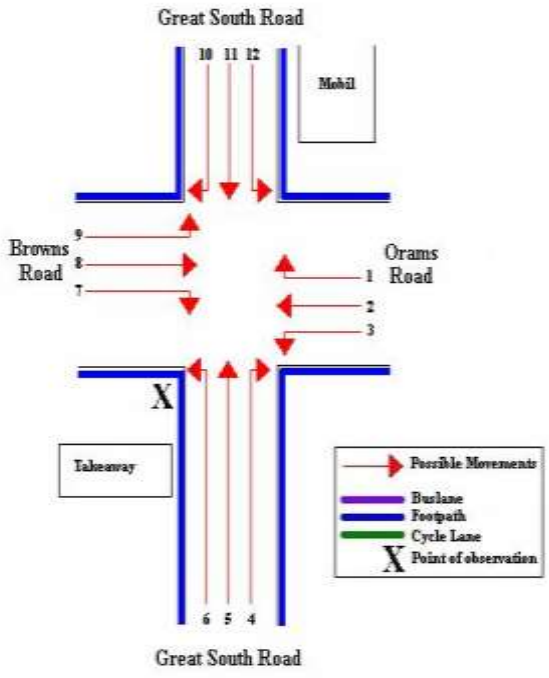


5. GREAT SOUTH ROAD/BROWNS ROAD/ORAMS ROAD, MANUREWA (SITE 26)

Figure 5.1 shows the possible cyclist movements at this intersection.

Figure 5.1: Cycle Movements: Great South/Browns/Orams Road





AADT Estimate

- The AADT for this site is 83. This compares with:
  - 57 in 2009
  - 81 in 2008
  - 86 in 2007.

-

	AM	PM	TOTAL
Raw Cycle Movement Counts 2010	**21**	**37**	**58**

5.1 Morning Peak

Environmental Conditions

- The weather was fine at the start of the morning shift with a breeze and clouds developing towards the end of the shift.
- There were no road works or accidents which may affect cycle counts.

Key Points

- Compared with last year, the volume of morning cyclists at the Great South/Browns/Orams Road intersection has remained stable at 21 cyclists.
- The key morning movement is straight along Great South Road in a northerly direction (Movement 5 = 12 cyclists).
- Compared with 2009, the most notable increase in cyclist volumes is at Movement 5 (up 6 cyclists).

Table 5.1: Morning Cyclist Movements

Great South/Browns/Orams Road 2007-2010 (n)

Movement	*2007*	*2008*	*2009*	*2010*	Change 09-10
1	4	1	6	2	-4
2	4	4	6	3	-3
3	0	2	0	0	0
4	0	1	0	2	2
5	8	12	6	12	6
6	3	0	0	1	1
7	0	2	0	0	0
8	0	0	0	0	0
9	2	2	1	1	0
10	0	2	2	0	-2
11	3	6	0	0	0
12	1	0	0	0	0
Total	**25**	**32**	**21**	**21**	**0**

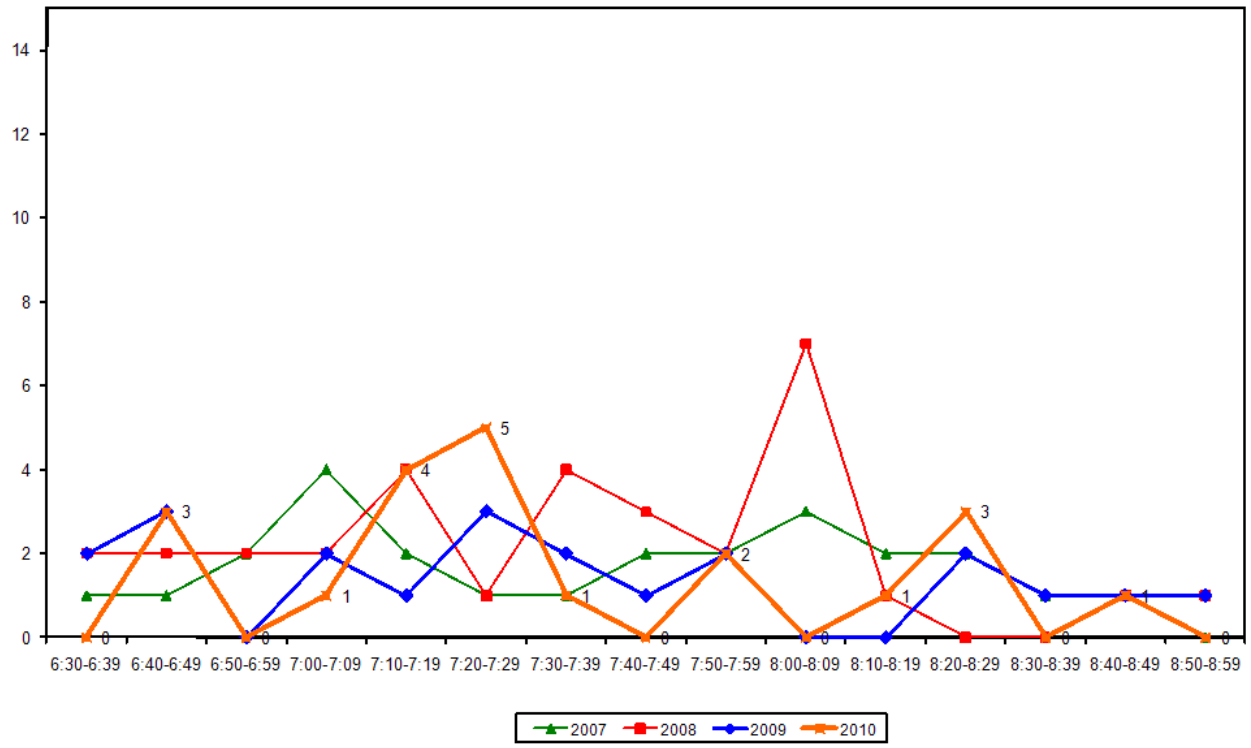
- Over the morning peak, most cyclists are adults (90 per cent, up slightly from 86 per cent last year).
- Consistent with the previous years, helmet wearing is widespread (95 per cent, up from 90 per cent in 2009).
- The majority of cyclists are riding on the road (76 per cent, up from 71 per cent in 2009).

Table 5.2: Morning Cyclist Characteristics
Great South/Browns/Orams Road 2007-2010 (%)

	2007	*2008*	*2009*	*2010*	Change 09-10
Cyclist Type					
Adult	92	94	86	90	4
School child	8	6	14	10	-4
Helmet Wearing					
Helmet on head	84	84	90	95	5
No helmet	16	16	10	5	-5
Where Riding					
Road	52	91	71	76	5
Footpath	48	9	29	24	-5
Base:	***25***	***32***	***21***	***21***	

- The volume of morning cycle movements is low throughout the morning shift, with a slight peak between 7:20am and 7:29am (5 cyclists). This compares with slight peaks between 6:40am and 6:49am, and 7:20am and 7:29am (3 cyclists in each period) in 2009.

Figure 5.2: Great South/Browns/Orams Road Cyclist Frequency – Morning Peak



5.2 Evening Peak

Environmental Conditions

- The weather was cloudy at the start of the evening shift with dense cloud and light rain towards the end of the shift.
- There were no road works or accidents that may affect cycle counts.

Key Points

- The volume of evening cyclist traffic at the Great South/Browns/Orams Road intersection in 2010 (37 movements) has notably increased when compared with the previous year (18 movements).
- In contrast to the morning shift, the most common movement in the evening is straight along Great South Road heading south (Movement 11 = 23 cyclists).
- Cyclist volumes have most notably increased at Movement 11 (up 15 cyclists).

Table 5.3: Evening Cyclist Movements

Great South/Browns/Orams Road 2007-2010 (n)

Movement	*2007*	*2008*	*2009*	*2010*	Change 09-10
1	0	0	0	0	0
2	0	3	0	0	0
3	0	3	0	2	2
4	1	1	1	2	1
5	4	2	4	3	-1
6	0	0	0	0	0
7	2	2	0	0	0
8	2	2	2	1	-1
9	0	0	0	0	0
10	2	1	0	3	3
11	18	5	8	23	15
12	6	4	3	3	0
Total	**35**	**23**	**18**	**37**	**19**

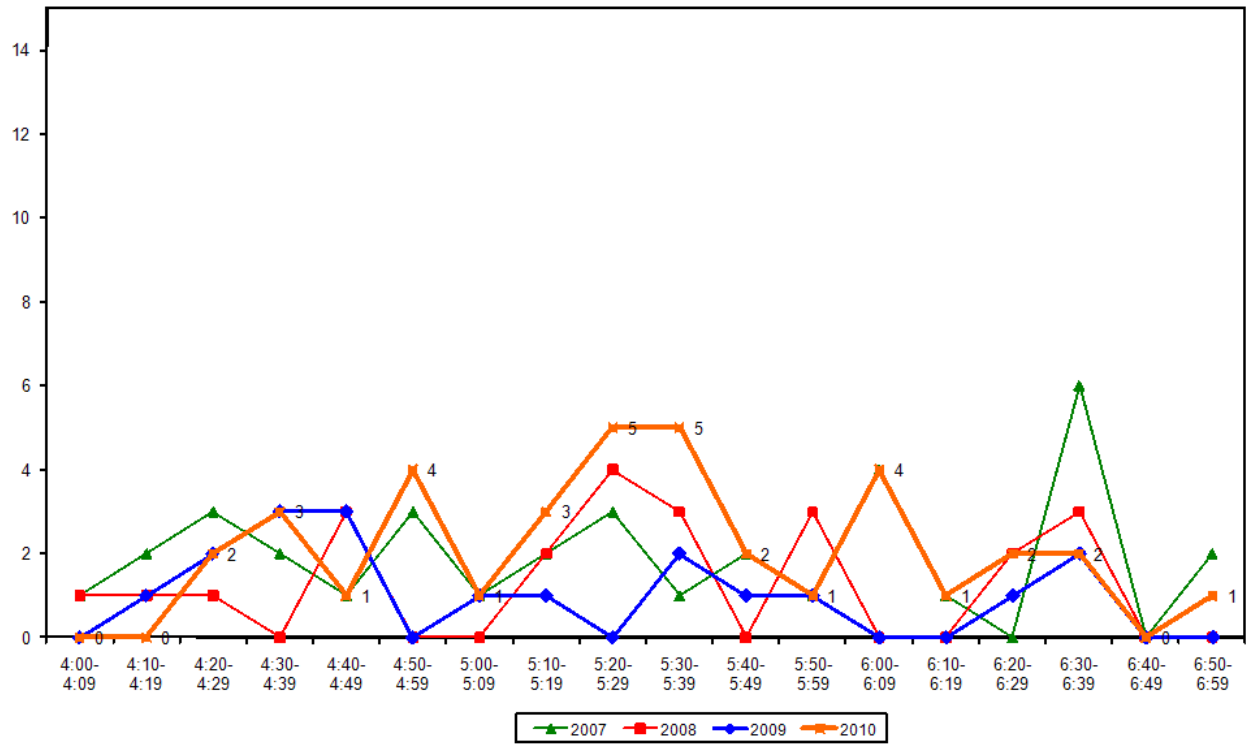
- Over the evening peak, the majority of the cyclists using this intersection continue to be adults (81 per cent, down from 89 per cent recorded in 2009).
- Helmet wearing remains at approximately three-quarters since last year (76 per cent in 2010, stable from 78 per cent last year).
- Approximately two-thirds of cyclists are riding on the road (70 per cent, stable from 67 per cent in 2009).

Table 5.4: Evening Cyclist Characteristics
Great South/Browns/Orams Road 2007-2010 (%)

	2007	*2008*	*2009*	*2010*	Change 09-10
Cyclist Type					
Adult	86	87	89	81	-8
School child	14	13	11	19	8
Helmet Wearing					
Helmet on head	86	91	78	76	-2
No helmet	14	9	22	24	2
Where Riding					
Road	54	87	67	70	3
Footpath	46	13	33	30	-3
Base:	***35***	***23***	***18***	***37***	

- The volume of cycle movements starts off relatively low in the evening and increases, to peak slightly between 5:20pm and 5:39pm (5 movements in each ten minute period). This compares to a slight peak between 4:30pm and 4:49pm (3 movements each ten minute period) in 2009.

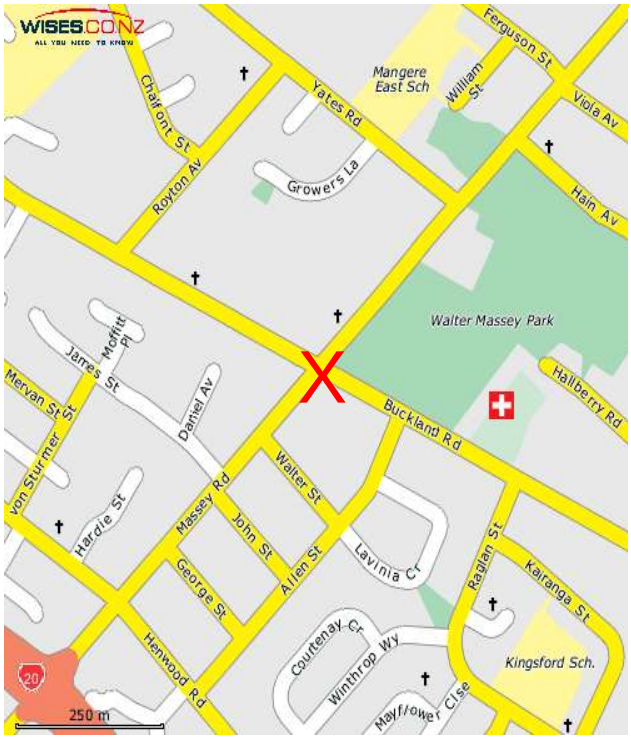
Figure 5.3: Great South/Browns/Orams Road Cyclist Frequency – Evening Peak

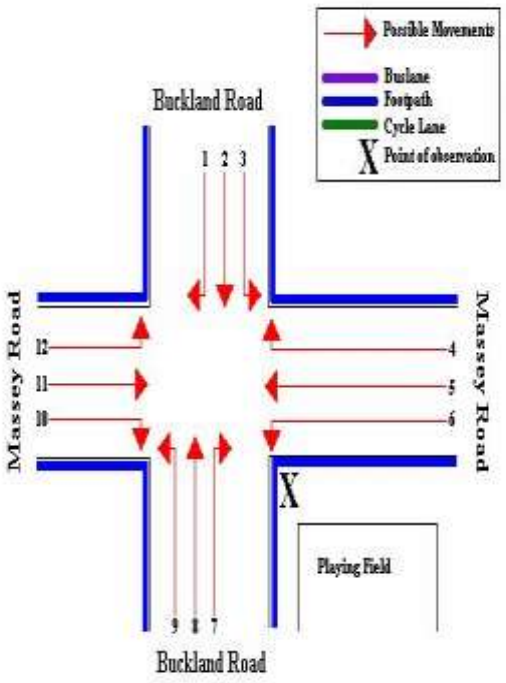


6. MASSEY ROAD/BUCKLAND ROAD, MANGERE (SITE 28)

Figure 6.1 shows the possible cyclist movements at this intersection.

Figure 6.1: Cycle Movements: Massey/Buckland Road





AADT Estimate

- The AADT for this site is 64. This compares with:
  - 57 in 2009
  - 44 in 2008
  - 61 in 2007.

	AM	PM	TOTAL
Raw Cycle Movement Counts 2010	**16**	**29**	**45**

6.1 Morning Peak

Environmental Conditions

- The weather was fine at the start of the morning shift with cloud developing towards the end of the morning shift.
- There were no road works or accidents that may affect cycle counts.

Key Points

- In 2010, the volume of morning cyclist traffic at this intersection has decreased, from 19 cycle movements in 2009 to 16 movements.
- The key cycle movements in 2010 are left from Buckland Road into Massey Road (Movement 3 = 3 cyclists), straight along Massey Road heading southwest (Movement 5 = 3 cyclists) and straight along Buckland Road heading northwest (Movement 8 = 3 cyclists).
- The most notable decreases have been at Movement 5 and Movement 11, both down 3 cyclists from 2009.

Table 6.1: Morning Cyclist Movements
Massey/Buckland Road 2007-2010 (n)

Movement	*2007*	*2008*	*2009*	*2010*	Change 09-10
1	0	0	0	0	0
2	3	1	2	1	-1
3	2	5	2	3	1
4	0	0	0	2	2
5	1	0	6	3	-3
6	1	2	0	2	2
7	0	0	1	1	0
8	1	1	3	3	0
9	1	0	2	0	-2
10	2	1	0	1	1
11	1	1	3	0	-3
12	0	0	0	0	0
Total	**12**	**11**	**19**	**16**	**-3**

- Over the morning peak, adults comprise almost all of the cycle movements (94 per cent, stable from last year).
- Just over two-thirds of cyclists are wearing a helmet (69 per cent, up notably from 47 per cent in 2009).
- Just over half of cyclists are riding on the road at this site (56 per cent, down from 63 per cent in 2009).

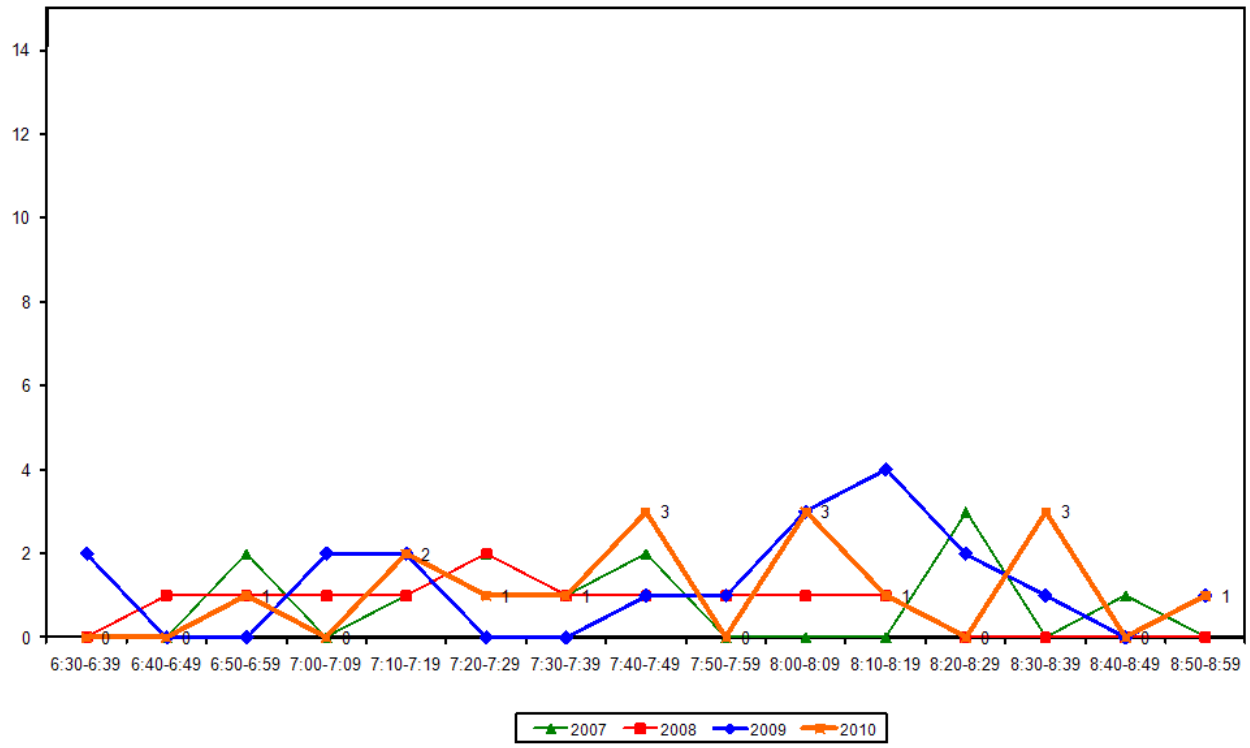
Table 6.2: Morning Cyclist Characteristics

Massey/Buckland Road 2007-2010 (%)

	2007	*2008*	*2009*	*2010*	Change 09-10
Cyclist Type					
Adult	42	73	95	94	-1
School child	58	27	5	6	1
Helmet Wearing					
Helmet on head	58	55	47	69	22
No helmet	42	45	53	31	-22
Where Riding					
Road	33	30	63	56	-7
Footpath	67	70	37	44	7
Base:	***12***	***11***	***19***	***16***	

- Morning cyclist volumes are very low over the entire monitoring period, with no more than two cyclists recorded during most ten minute intervals. Three slight peaks occurred this year between 7:40am and 7:49am, 8:00am and 8:09am, and 8:30am and 8:39am (3 cyclists in each ten minute interval). The 2009 records showed a slight peak occurring between 8:10am and 8:19am (4 movements).

Figure 6.2: Massey/Buckland Road Cyclist Frequency – Morning Peak



6.2 Evening Peak

Environmental Conditions

- The weather was overcast and windy throughout the evening shift, with some light rain between 5:19pm and 5:27pm.
- There were no road works or accidents that may affect cycle counts.

Key Points

- The total number of cycle movements recorded in the evening at the Massey/Buckland Road intersection has increased from last year, with 29 movements recorded (up from 20 in 2009).
- The most common movement in the evening is heading straight along Massey Road heading northeast (Movement 11 = 6 cyclists).
- All movements at this site are relatively stable since last year, with change most notable at Movement 11 (up 4 cyclists).

Table 6.3: Evening Cyclist Movements
Massey/Buckland Road 2007-2010 (n)

Movement	*2007*	*2008*	*2009*	*2010*	Change 09-10
1	2	0	0	0	0
2	3	4	3	4	1
3	4	2	1	1	0
4	5	5	2	4	2
5	1	1	2	4	2
6	3	1	5	3	-2
7	1	1	2	0	-2
8	5	3	0	2	2
9	0	2	0	1	1
10	0	0	3	4	1
11	5	1	2	6	4
12	2	0	0	0	0
Total	**31**	**20**	**20**	**29**	**9**

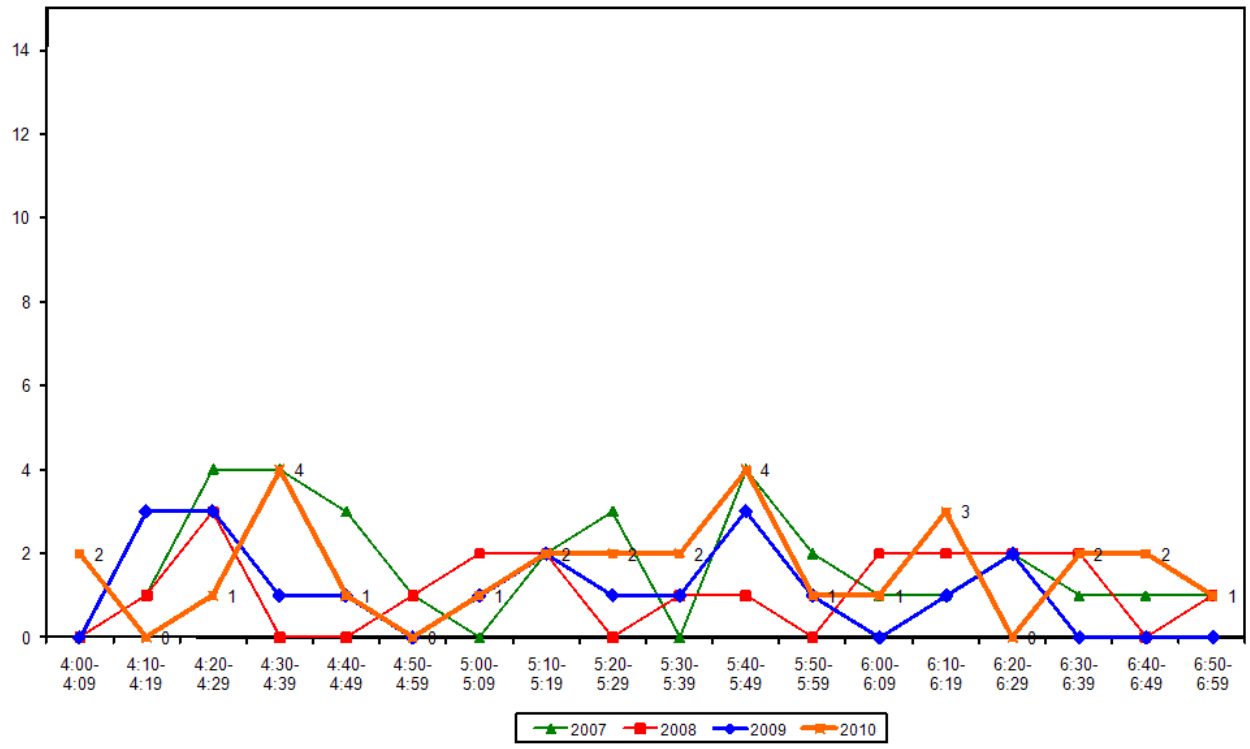
- Adults comprise a larger share of evening cyclists than school children (90 per cent, up notably from 65 per cent in 2009).
- Approximately three-fifths of cyclists are wearing a helmet (62 per cent, up notably from 5 per cent last year).
- The proportion of cyclists riding on the footpath has decreased this year. (62 per cent, compared with 70 per cent in 2009).

Table 6.4: Evening Cyclist Characteristics
Massey/Buckland Road 2007-2010 (%)

	2007	*2008*	*2009*	*2010*	Change 09-10
Cyclist Type					
Adult	61	80	65	90	25
School child	39	20	35	10	-25
Helmet Wearing					
Helmet on head	55	65	35	62	27
No helmet	45	35	65	38	-27
Where Riding					
Road	39	60	30	38	8
Footpath	61	40	70	62	-8
Base:	***31***	***20***	***20***	***29***	

- As in 2009, the volume of cycle movements peaks twice in the evening monitoring period. The first of these is between 4:30pm and 4:39pm (4 cyclists). The second slight peak occurs between 5:40pm and 5:49pm (4 cyclists), matching the slight peak observed in 2009. In general, evening cyclist volumes are very low over the entire monitoring period.

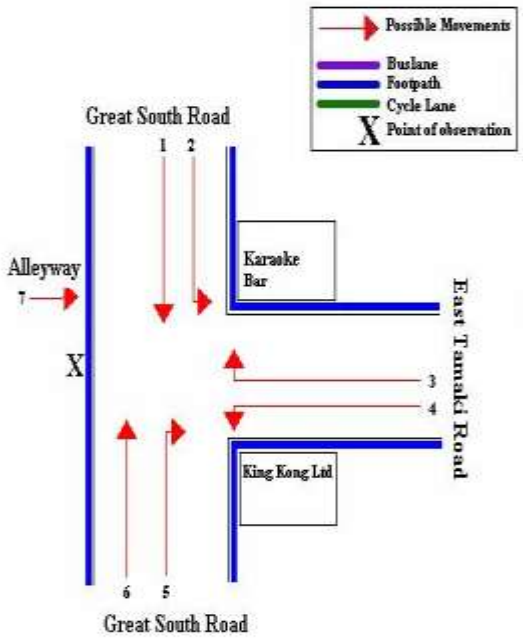
Figure 6.3: Massey/Buckland Road Cyclist Frequency – Evening Peak



7. GREAT SOUTH ROAD/EAST TAMAKI ROAD, PAPATOETOE (SITE 30)

Figure 7.1 shows the possible cyclist movements at this intersection.

Figure 7.1: Cycle Movements: Great South/East Tamaki Road



AADT Estimate

- The AADT for this site is 93. This compares with:
  - 92 in 2009
  - 74 in 2008
  - 106 in 2007.

-

	AM	PM	TOTAL
Raw Cycle Movement Counts 2010	**25**	**40**	**65**

7.1 Morning Peak

Environmental Conditions

- The weather was fine at the start of the morning shift, with cloud forming to create overcast conditions towards the end of the morning shift.
- There were no road works or accidents that may affect cycle counts.

Key Points

- Compared with last year, the volume of morning cyclists at the Great South/East Tamaki Road intersection has decreased, from 33 movements in 2009 to 25 movements in 2010.
- The most common movement is straight along Great South Road heading northwest (Movement 6 = 15 cyclists).
- The most notable change since 2009 has been at Movement 3 (down 4 cyclists).

Table 7.1: Morning Cyclist Movements

Great South/East Tamaki Road 2007-2010 (n)

Movement	*2007*	*2008*	*2009*	*2010*	Change 09-10
1	4	4	3	4	1
2	2	3	3	1	-2
3	2	1	6	2	-4
4	0	1	3	3	0
5	2	2	3	0	-3
6	26	12	15	15	0
7	-	1	0	0	0
Total	**36**	**24**	**33**	**25**	**-8**

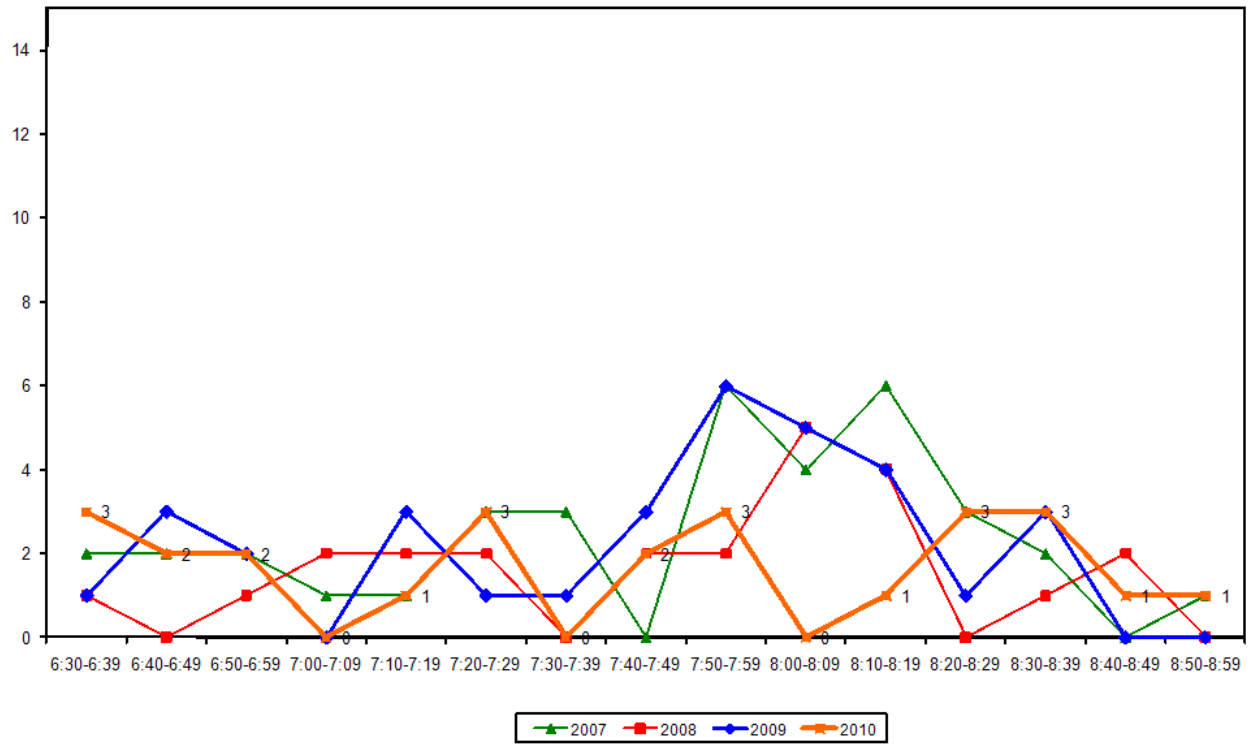
- Over the morning peak, the greater portion of cyclists are adults (72 per cent, up from 64 per cent last year).
- Most cyclists are wearing a helmet (84 per cent, up from 73 per cent in 2009).
- The share of cyclists riding on the road at this site has decreased notably since last year – down from 82 per cent in 2009 to 60 per cent this year.

Table 7.2: Morning Cyclist Characteristics
Great South/East Tamaki Road 2007-2010 (%)

	2007	*2008*	*2009*	*2010*	Change 09-10
Cyclist Type					
Adult	67	67	64	72	8
School child	33	33	36	28	-8
Helmet Wearing					
Helmet on head	89	88	73	84	11
No helmet	11	12	27	16	-11
Where Riding					
Road	50	25	82	60	-22
Footpath	50	75	18	40	22
Base:	***36***	***24***	***33***	***25***	

- The volume of morning cycle movements shows no evident peaks this year, with cyclist movements not exceeding 3 cyclists over any of the ten minute intervals. This compares to a peak of 6 cyclists between 7:50am and 7:59am in 2009.

Figure 7.2: Great South/East Tamaki Road Cyclist Frequency – Morning Peak



7.2 Evening Peak

Environmental Conditions

- The weather was overcast and breezy throughout the evening shift, with a patch of rain between 5:30pm and 5:36pm and drizzle persistent towards the end of the evening shift.
- There were no road works or accidents that may affect cycle counts.

Key Points

- Since last year, the total number of evening cycle movements recorded at the Great South/East Tamaki Road intersection has increased (40 movements, up from 30 movements in 2009).
- The key movement in the evening is straight along Great South Road heading south (Movement 1 = 14 cyclists).
- Compared with last year, the most notable increase is at Movement 6 (up 5 cyclists).

Table 7.3: Evening Cyclist Movements
Great South/East Tamaki Road 2007-2010 (n)

Movement	*2007*	*2008*	*2009*	*2010*	Change 09-10
1	13	10	13	14	1
2	2	2	3	1	-2
3	8	1	3	5	2
4	3	1	6	5	-1
5	2	0	1	3	2
6	9	10	4	9	5
7	-	3	0	3	3
Total	**37**	**27**	**30**	**40**	**10**

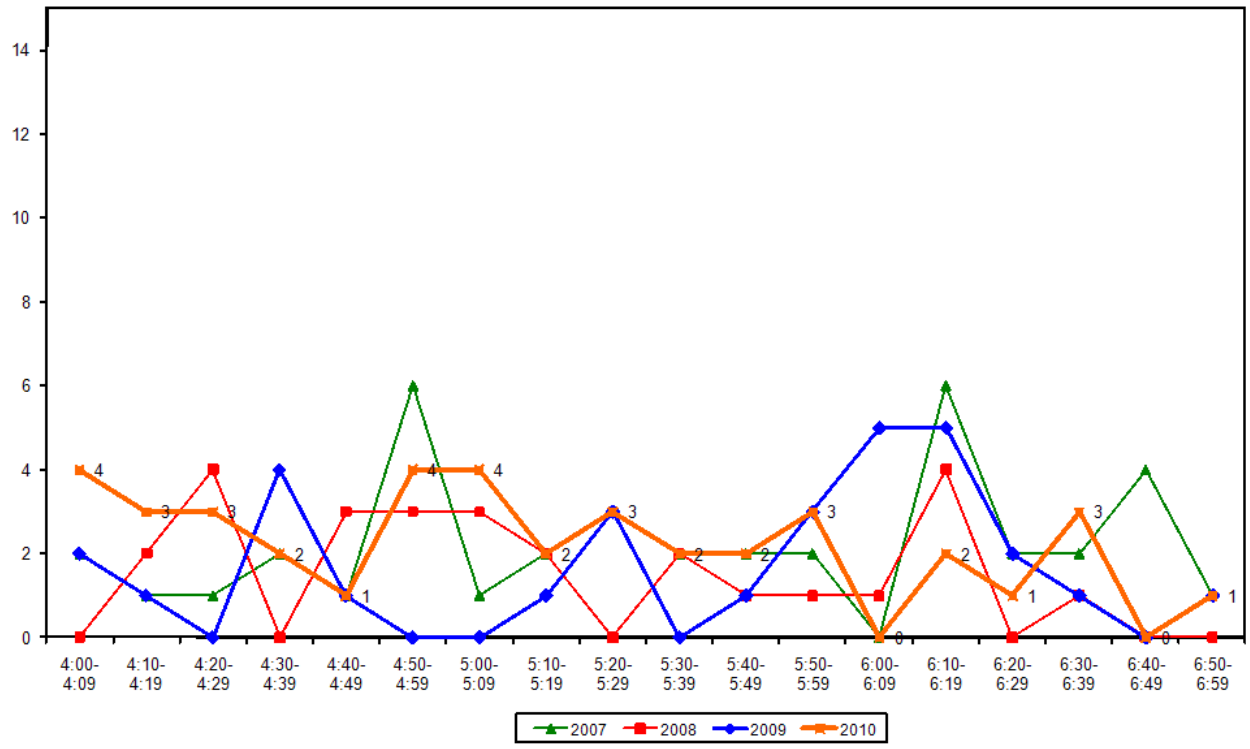
- Over the evening peak, the majority of cyclists using the Great South/East Tamaki Road intersection are adults (80 per cent, stable from 77 per cent last year).
- Approximately two-thirds of cyclists at this site are wearing a helmet (68 per cent, down from 73 per cent in 2009).
- More cyclists are riding on the footpath than on the road (57 per cent, up from 30 per cent last year).

Table 7.4: Evening Cyclist Characteristics
Great South/East Tamaki Road 2007-2010 (%)

	2007	*2008*	*2009*	*2010*	**Change 09-10**
Cyclist Type					
Adult	84	74	77	80	3
School child	16	26	23	20	-3
Helmet Wearing					
Helmet on head	84	56	73	68	-5
No helmet	16	44	27	33	6
Where Riding					
Road	54	44	70	43	-27
Footpath	46	56	30	57	27
Base:	***37***	***27***	***30***	***40***	

- This year, the volume of cycle movements clearly peaks twice: once between 4:00pm and 4:09pm (4 movements) and then approximately an hour later between 4:50pm and 5:09pm (with 4 movements over each ten minute interval). This compares to peaks between 4:30pm and 4:39pm and 6:00pm and 6:19pm in 2009.

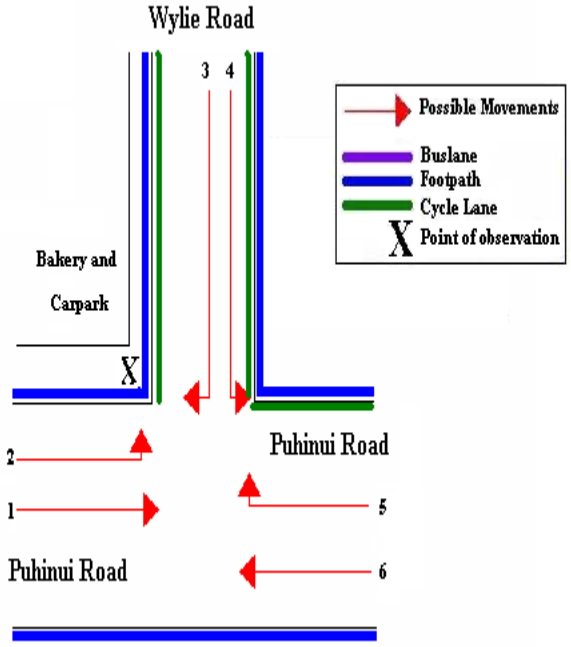
Figure 7.3: Great South/East Tamaki Road Cyclist Frequency – Evening Peak



8. WYLLIE AVENUE/PUHINUI ROAD, PAPATOETOE (SITE 31)

Figure 8.1 shows the possible cyclist movements at this intersection.

Figure 8.1: Cycle Movements: Wyllie Avenue/Puhinui Road



AADT Estimate

- The AADT for this site is 82. This compares with:
  - 50 in 2009
  - 47 in 2008
  - 55 in 2007.

-

	AM	*PM*	*TOTAL*
Raw Cycle Movement Counts 2010	**23**	**34**	**57**

8.1 Morning Peak

Environmental Conditions

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

Key Points

- The volume of morning cyclists at Wyllie Avenue/Puhinui Road has increased notably this year with 23 cycle movements recorded (up from 12 movements in 2009).
- The most common movement in the morning is north-east along Puhinui Road (away from the airport) (Movement 1 = 11 cyclists).
- The most notable increase is at Movement 1, up 10 cyclist movements from 2009.

Table 8.1: Morning Cyclist Movements
Wyllie Avenue/Puhinui Road 2007-2010 (n)

Movement	*2007*	*2008*	*2009*	*2010*	Change 09-10
1	0	2	1	11	10
2	0	0	1	0	-1
3	0	1	3	2	-1
4	1	1	0	2	2
5	0	0	0	1	1
6	17	4	7	7	0
Total	**18**	**8**	**12**	**23**	**11**

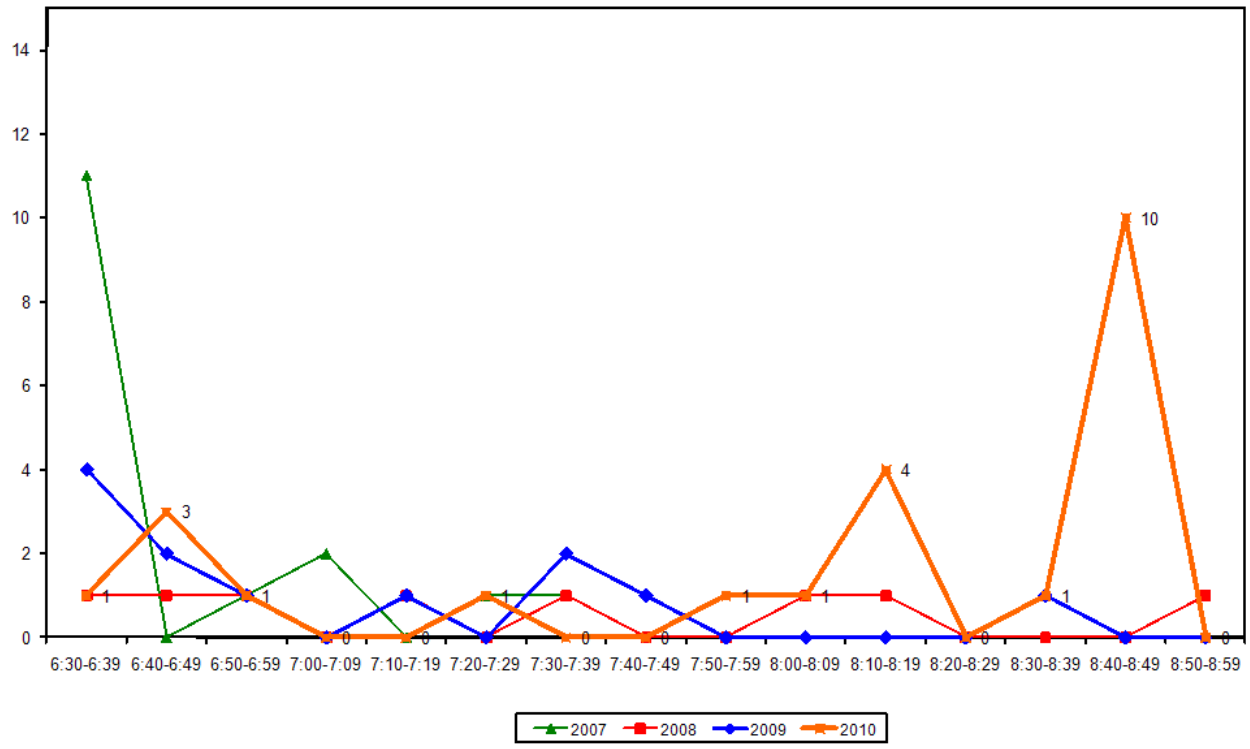
- The majority of cyclists recorded this year were adults (91 per cent, down from 100 per cent last year).
- Most cyclists are wearing a helmet (87 per cent, down from 100 per cent in 2009).
- Most cyclists are riding on the road (87 per cent, down from 100 per cent in 2009).

Table 8.2: Morning Cyclist Characteristics
Wyllie Avenue/Puhinui Road 2007-2010 (%)

	2007	*2008*	*2009*	*2010*	Change 09-10
Cyclist Type					
Adult	100	100	100	91	-9
School child	0	0	0	9	9
Helmet Wearing					
Helmet on head	100	88	100	87	-13
No helmet	0	12	0	13	13
Where Riding					
Road	100	100	100	87	-13
Footpath	0	0	0	13	13
Base:	***18***	***8***	***12***	***23***	

- Morning cyclist volumes peak sharply near the end of the morning shift, with 10 cyclists recorded between 8:40am and 8:49am. This compares with low cycle volumes over most of the monitoring period in 2009, with a peak between 6:30am and 6:39am (4 cyclists) and a slight peak between 7:30am and 7:39am (2 cyclists).

Figure 8.2: Wyllie Avenue/Puhinui Road Cyclist Frequency – Morning Peak



8.2 Evening Peak

Environmental Conditions

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

Key Points

- This year, the total number of evening cycle movements recorded at the Wyllie Avenue/Puhinui Road intersection has increased, from 23 in 2009 to 34 movements.
- Consistent with 2009, the key evening movement is straight along Puhinui Road heading west (Movement 6 = 19 cyclists, up by 6 cyclists).

Table 8.3: Evening Cyclist Movements

Wyllie Avenue/Puhinui Road 2007-2010 (n)

Movement	*2007*	*2008*	*2009*	*2010*	Change 09-10
1	7	11	6	7	1
2	3	3	1	2	1
3	2	0	0	0	0
4	3	2	1	3	2
5	3	5	2	3	1
6	2	4	13	19	6
Total	**20**	**25**	**23**	**34**	**11**

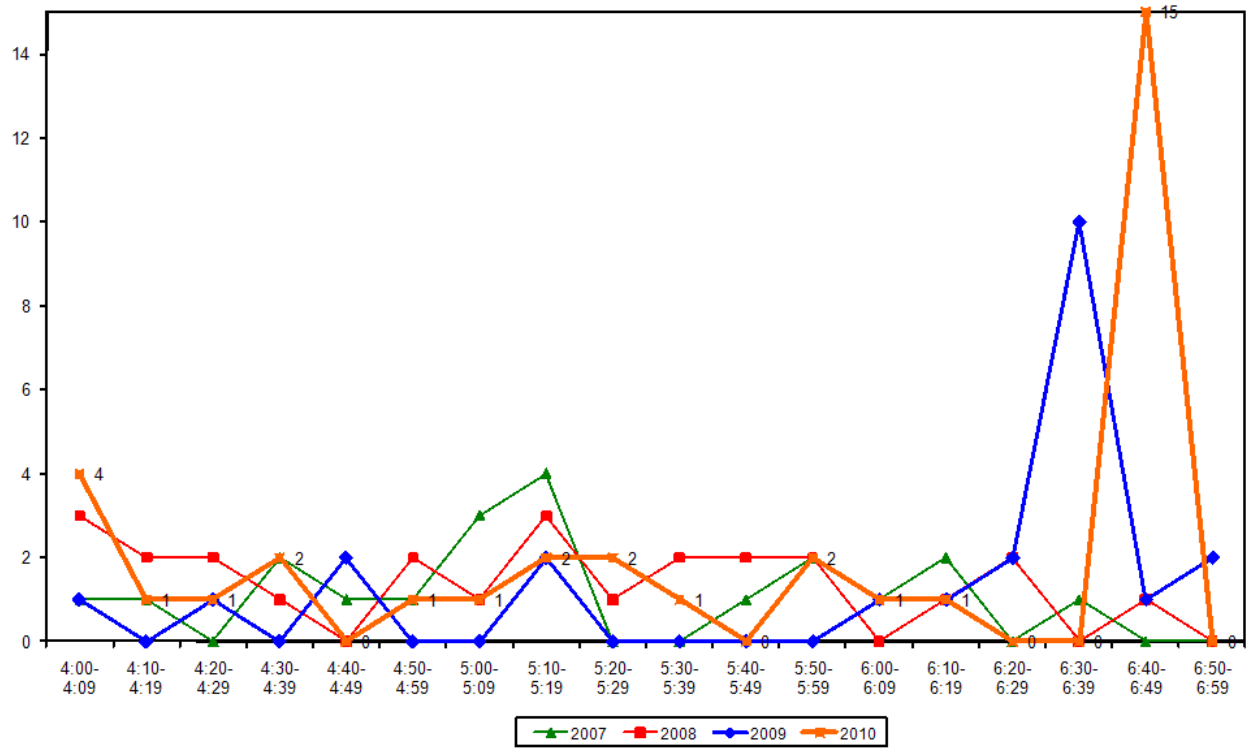
- Over the evening peak, all cyclists using this site are adults (100 per cent, up from 87 per cent last year).
- The majority of cyclists at this site are wearing a helmet (97 per cent, up from 91 per cent in 2009).
- Eighty-eight per cent of cyclists are riding on the road this year (down slightly from 91 per cent in 2009).

Table 8.4: Evening Cyclist Characteristics
Wyllie Avenue/Puhinui Road 2007-2010 (%)

	2007	*2008*	*2009*	*2010*	Change 09-10
Cyclist Type					
Adult	75	88	87	100	13
School child	25	12	13	0	-13
Helmet Wearing					
Helmet on head	70	79	91	97	6
No helmet	30	21	9	3	-6
Where Riding					
Road	70	84	91	88	-3
Footpath	30	16	9	12	3
Base:	***20***	***25***	***23***	***34***	

- This year the volume of cycle movements peaks notably between 6:40pm and 6:49pm (15 movements). This compares with a peak of 10 cyclists between 6:30pm and 6:39pm in 2009.

Figure 8.3: Wyllie Avenue/Puhinui Road Cyclist Frequency – Evening Peak

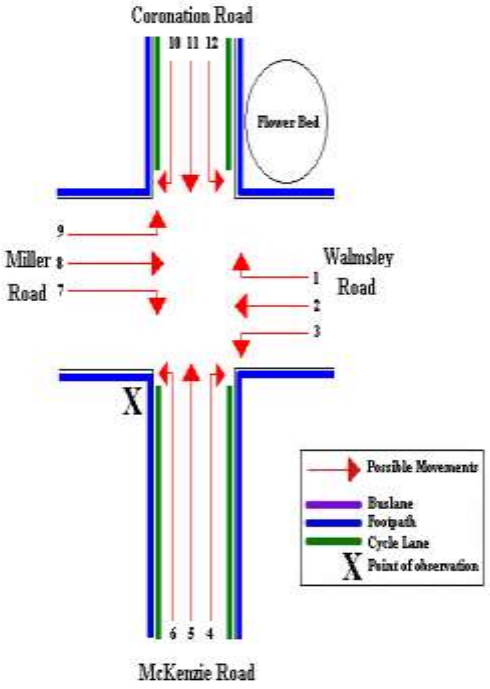


Note: In 2010, 12 cyclists were observed riding as a group at 6.42pm. This comprises 35 per cent of the total cycle movements in the evening peak in 2010.

9. MCKENZIE ROAD/CORONATION ROAD/WALMSLEY ROAD, MANGERE (SITE 32)

Figure 9.1 shows the possible cyclist movements at this intersection.

Figure 9.1: Cycle Movements: McKenzie/Coronation/Walmsley Road



AADT Estimate

- The AADT for this site is 126. This compares with:
  - 75 in 2009
  - 82 in 2008
  - 101 in 2007.

-

	AM	PM	TOTAL
Raw Cycle Movement Counts 2010	**38**	**49**	**87**

9.1 Morning Peak

Environmental Conditions

- The weather was fine over most of the morning shift, with a patch of very light drizzle between 7:35am and 7:43am.
- There were no road works or accidents that may affect cycle counts.

Key Points

- In 2010, the volume of morning cyclists recorded at the McKenzie/Coronation/Walmsley Road intersection has increased notably (from 22 in 2009 to 38 movements this year).
- The most common movement in the morning is south down Coronation Road (Movement 11 = 12 cyclists).
- Of the 12 movements possible at this intersection, the most notable changes are at Movements 2 and 5 (each up 4 cyclists).

Table 9.1: Morning Cyclist Movements

McKenzie/Coronation/Walmsley Road 2007-2010 (n)

Movement	*2007*	*2008*	*2009*	*2010*	Change 09-10
1	1	0	1	2	1
2	2	3	0	4	4
3	3	0	2	3	1
4	1	0	0	1	1
5	8	2	3	7	4
6	2	1	0	0	0
7	2	1	1	3	2
8	0	0	2	3	1
9	0	0	0	0	0
10	0	0	0	2	2
11	9	14	11	12	1
12	0	0	2	1	-1
Total	**28**	**21**	**22**	**38**	**16**

- Over the morning peak, adults comprise the greatest share of the cycle movements (84 per cent, down from 91 per cent last year).
- The majority of cyclists are wearing a helmet (71 per cent, down notably from 86 per cent in 2009).
- Approximately two in three cyclists are riding on the road (66 per cent, compared with 82 per cent last year).

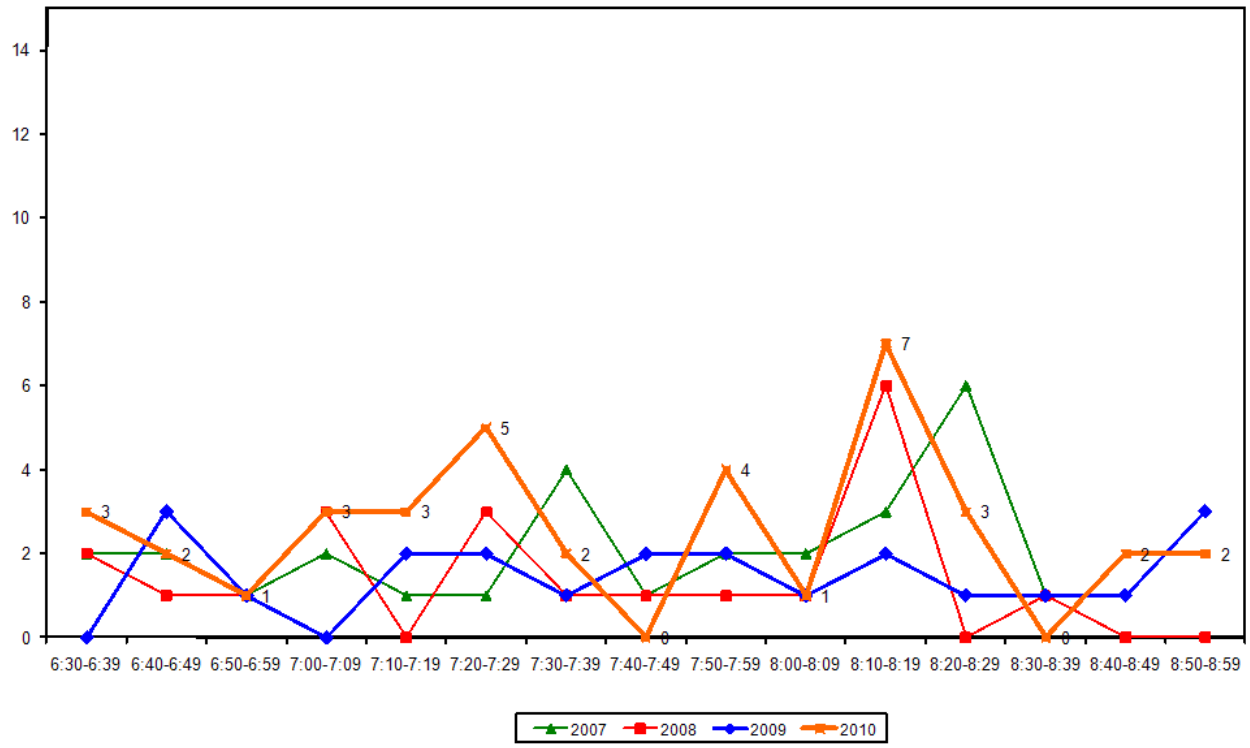
Table 9.2: Morning Cyclist Characteristics

McKenzie/Coronation/Walmsley Road 2007-2010 (%)

	2007	*2008*	*2009*	*2010*	**Change 09-10**
Cyclist Type					
Adult	71	86	91	84	-7
School child	29	14	9	16	7
Helmet Wearing					
Helmet on head	71	71	86	71	-15
No helmet	29	29	14	29	15
Where Riding					
Road	64	67	82	66	-16
Footpath	36	33	18	34	16
Base:	***28***	***21***	***22***	***38***	

- The volume of morning cyclists peaks between 8:10am and 8:19am (7 cyclists). This compares with a slight peak between 6:40pm and 6:49pm (3 movements) and again at the end of the monitoring period (3 movements) in 2009.

Figure 9.2: McKenzie/Coronation/Walmsley Road Cyclist Frequency – Morning Peak



9.2 Evening Peak

Environmental Conditions

- The weather was overcast with intermittent showers throughout the evening shift.
- There was a car broken down on Miller Road between 6:35pm and 6:50pm which may have affected cycle movements. There were no road works during the evening shift.

Key Points

- Compared with the previous year, the total number of cycle movements recorded at the McKenzie/Coronation/Walmsley Road intersection has increased notably, to 49 movements in the evening (up from 30 movements in 2009).
- In contrast to the morning shift, the most common movement in the evening is northbound from McKenzie Road to Coronation Road (Movement 5 = 18 cyclists).
- Evening cyclist volumes at most movements remain stable since last year, with the most notable change being at Movement 1 and Movement 11 (up 4 cyclists each).

Table 9.3: Evening Cyclist Movements
McKenzie/Coronation/Walmsley Road 2007-2010 (n)

Movement	*2007*	*2008*	*2009*	*2010*	Change 09-10
1	2	4	0	4	4
2	1	3	1	3	2
3	1	3	2	4	2
4	0	0	1	2	1
5	14	14	15	18	3
6	3	3	1	2	1
7	2	0	1	1	0
8	0	1	1	1	0
9	3	0	1	0	-1
10	0	0	1	2	1
11	11	6	5	9	4
12	5	2	1	3	2
Total	**42**	**36**	**30**	**49**	**19**

- Over the evening peak, the greatest share of cyclists using this intersection are adults (86 per cent, stable from 87 per cent last year).
- Just more than three-quarters of cyclists at this site are wearing a helmet (76 per cent, stable from 73 per cent in 2009).
- Just less than two-thirds of cyclists are riding on the road (65 per cent, down from 73 per cent last year).

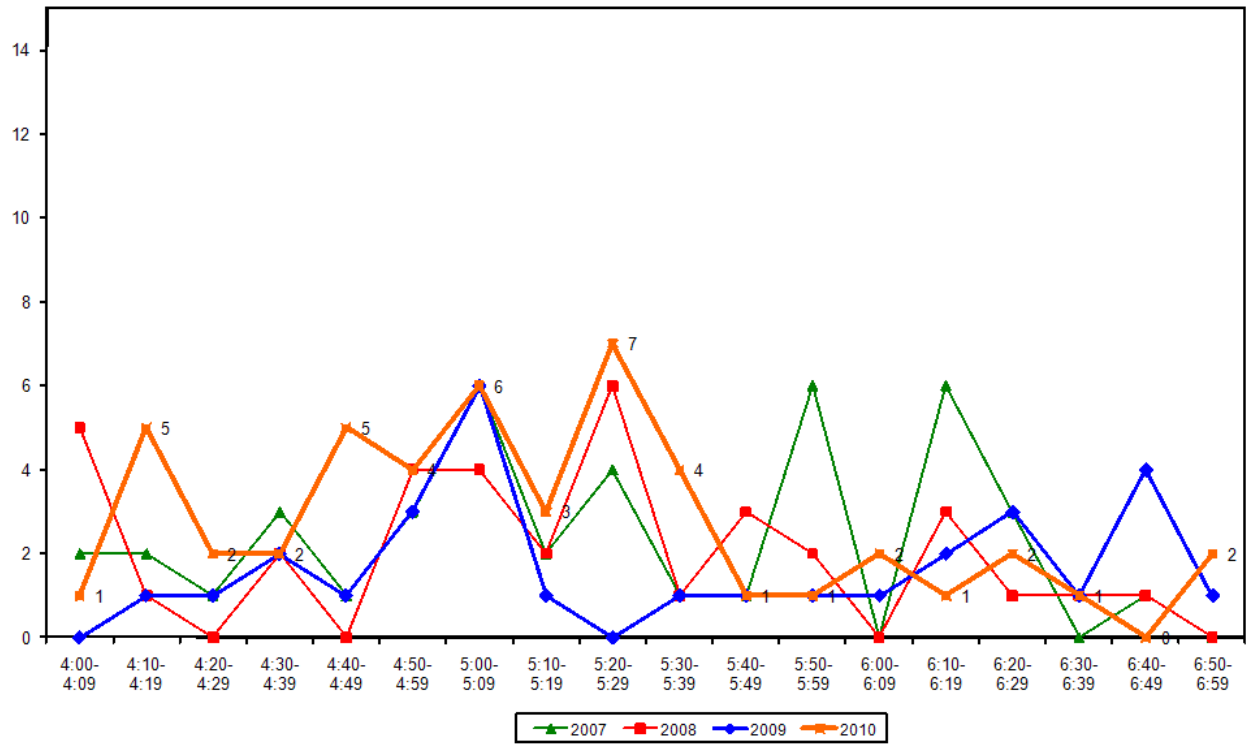
Table 9.4: Evening Cyclist Characteristics

McKenzie/Coronation/Walmsley Road 2007-2010 (%)

	2007	*2008*	*2009*	*2010*	Change 09-10
Cyclist Type					
Adult	76	89	87	86	-1
School child	24	11	13	14	1
Helmet Wearing					
Helmet on head	74	78	73	76	3
No helmet	26	22	27	24	-3
Where Riding					
Road	81	71	73	65	-8
Footpath	19	29	27	35	8
Base:	***42***	***36***	***30***	***49***	

- This year, the volume of evening cycle movements is higher during the first half of the monitoring period, with a slight peak between 5:20pm and 5:29pm (7 cyclists). This compares with an earlier peak between 5:00pm and 5:09pm in 2009.

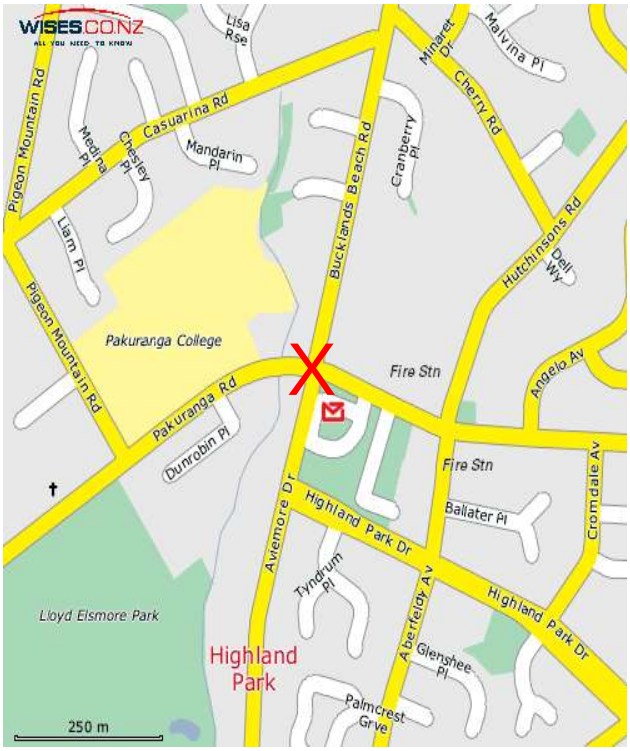
Figure 9.3: McKenzie/Coronation/Walmsley Road Cyclist Frequency – Evening Peak

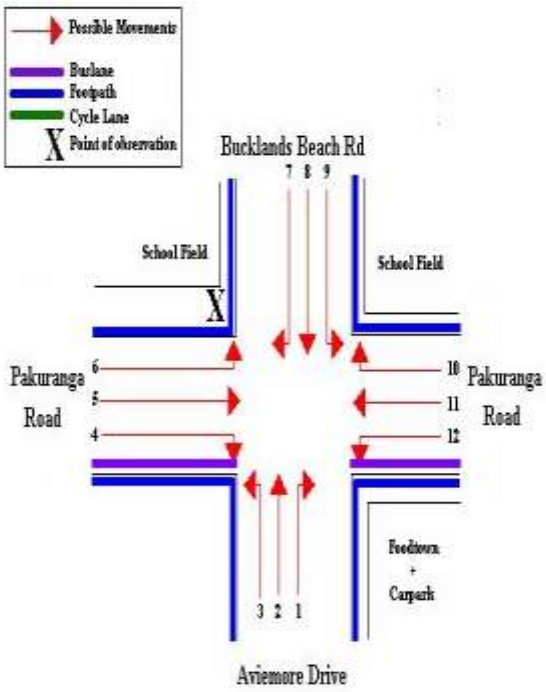


10. BUCKLANDS BEACH ROAD/PAKURANGA ROAD, PAKURANGA (SITE 33)

Figure 10.1 shows the possible cyclist movements at this intersection.

Figure 10.1: Cycle Movements: Bucklands Beach/Pakuranga Road





AADT Estimate

- The AADT for this site is 164. This compares with:
  - 137 in 2009
  - 187 in 2008
  - 203 in 2007.

-

	AM	PM	TOTAL
Raw Cycle Movement Counts 2010	**45**	**69**	**114**

10.1 Morning Peak

Environmental Conditions

- The weather was fine throughout the morning shift, with some cloud cover developing towards the end of the monitoring period.
- There were no road works or accidents that may affect cycle counts.

Key Points

- Of the 14 sites monitored in Manukau city, the Bucklands Beach/Pakuranga Road intersection is the busiest in terms of morning cyclist activity, with 45 cycle movements recorded (down from 51 movements in 2009).
- The most common morning movement is straight along Pakuranga Road heading west (Movement 11 = 9 cyclists).
- The most notable changes are reported at Movement 3 and Movement 8 (both down 6 cyclists).

Table 10.1: Morning Cyclist Movements
Bucklands Beach/Pakuranga Road 2007-2010 (n)

Movement	*2007*	*2008*	*2009*	*2010*	Change 09-10
1	0	0	0	0	0
2	7	6	3	3	0
3	15	8	12	6	-6
4	1	0	2	4	2
5	3	3	6	7	1
6	2	3	2	2	0
7	5	3	2	4	2
8	5	8	9	3	-6
9	5	3	1	2	1
10	2	2	0	4	4
11	22	16	14	9	-5
12	1	1	0	1	1
Total	**68**	**53**	**51**	**45**	**-6**

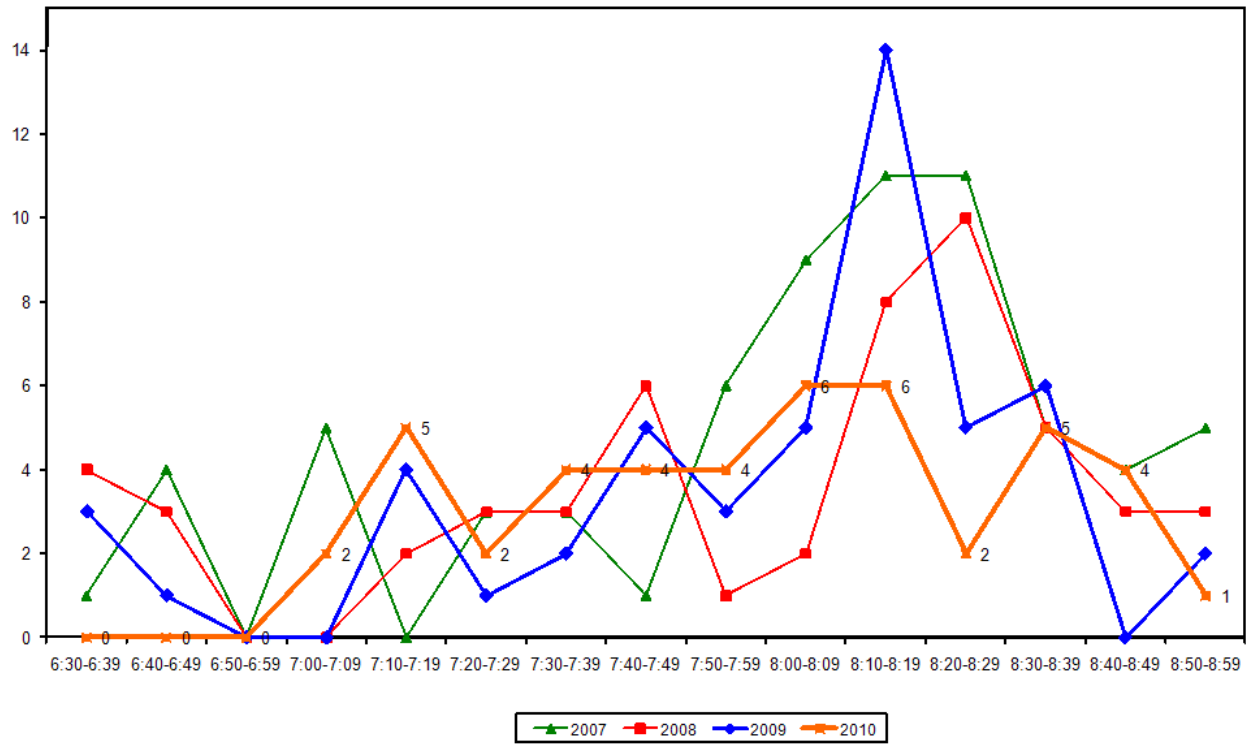
- The proportion of all cyclists who are adults has increased since last year (62 per cent, up from 45 per cent in 2009).
- Most cyclists are wearing a helmet (87 per cent, stable from 90 per cent in the previous year).
- The incidence of cyclists riding on the footpath is the second highest at this site compared with other sites monitored in Manukau city (64 per cent, stable from 61 per cent last year).

Table 10.2: Morning Cyclist Characteristics
Bucklands Beach/Pakuranga Road 2007-2010 (%)

	2007	*2008*	*2009*	*2010*	Change 09-10
Cyclist Type					
Adult	43	58	45	62	17
School child	57	42	55	38	-17
Helmet Wearing					
Helmet on head	75	91	90	87	-3
No helmet	25	9	10	13	3
Where Riding					
Road	24	47	39	36	-3
Footpath	76	53	61	64	3
Base:	***68***	***53***	***51***	***45***	

- This year, the volume of morning cycle movements peaks slightly between 8:00am and 8:19am (6 cyclists per ten minute interval). This somewhat matches the clear peak between 8:10am and 8:19am (14 cyclists) observed in 2009.

Figure 10.2: Bucklands Beach/Pakuranga Road Cyclist Frequency – Morning Peak



10.2 Evening Peak

Environmental Conditions

- Dark cloud was present from the start of the evening shift, with a period of heavy rain between 5:43pm and 6:57pm.
- There were no road works or accidents that may affect cycle counts.

Key Points

- The Bucklands Beach/Pakuranga Road intersection has the second highest level of cyclist traffic in the evening, with 69 cycle movements recorded (up notably from 43 movements last year).
- The most common movement in the evening is straight along Pakuranga Road heading west (Movement 11 = 14 cyclists).
- Across the twelve movements possible at this intersection, the most notable increase has been at Movement 11 (up 10 cyclists).

Table 10.3: Evening Cyclist Movements
Bucklands Beach/Pakuranga Road 2007-2010 (n)

Movement	*2007*	*2008*	*2009*	*2010*	Change 09-10
1	0	1	0	0	0
2	4	7	11	9	-2
3	4	8	2	1	-1
4	11	10	4	6	2
5	10	9	7	11	4
6	7	6	2	7	5
7	11	9	5	2	-3
8	7	7	6	12	6
9	4	4	1	6	5
10	4	8	0	0	0
11	10	6	4	14	10
12	0	2	1	1	0
Total	**72**	**77**	**43**	**69**	**26**

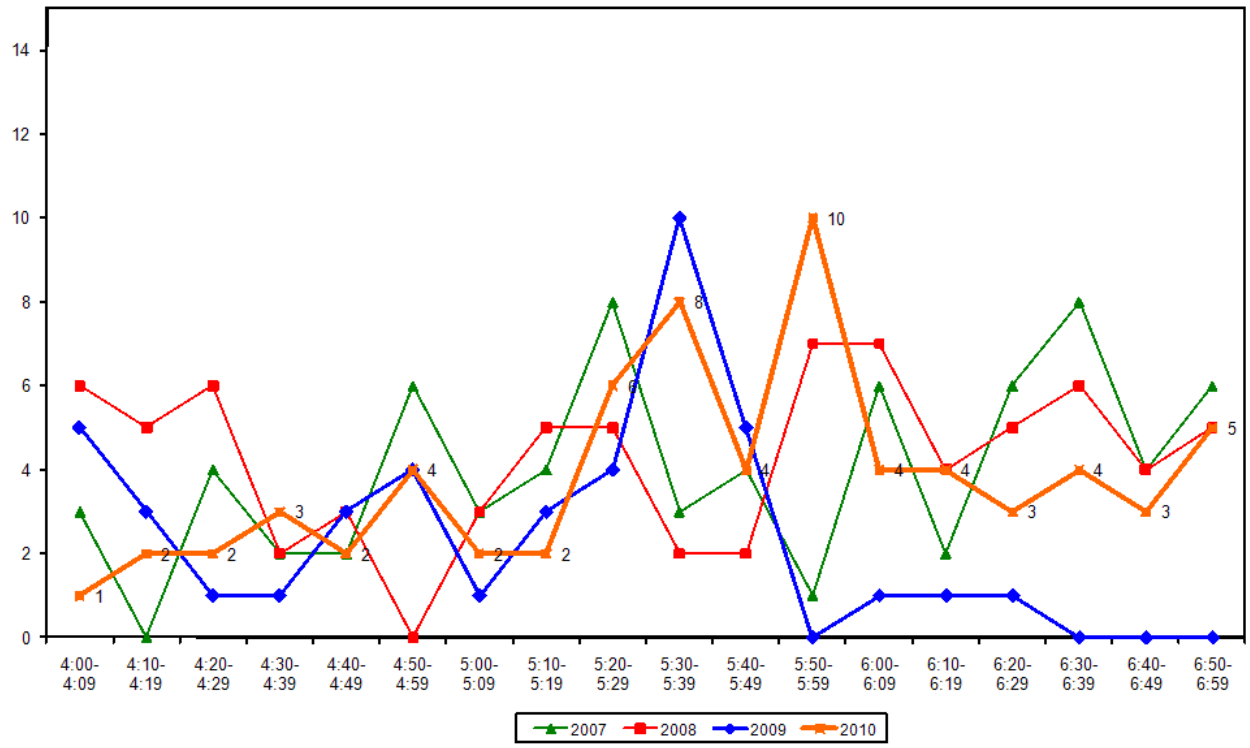
- Adult cyclists comprise the greatest share of cycle movements (70 per cent, down notably from 91 per cent in 2009).
- Most cyclists at this site are wearing a helmet (81 per cent, down slightly from 86 per cent last year).
- Compared with last year, the share of cyclists riding on the road has increased (up from 53 per cent in 2009 to 64 per cent this year).

Table 10.4: Evening Cyclist Characteristics
Bucklands Beach/Pakuranga Road 2007-2010 (%)

	2007	*2008*	*2009*	*2010*	Change 09-10
Cyclist Type					
Adult	76	65	91	70	-21
School child	24	35	9	30	21
Helmet Wearing					
Helmet on head	68	77	86	81	-5
No helmet	32	23	14	19	5
Where Riding					
Road	38	44	53	64	11
Footpath	62	56	47	36	-11
Base:	***72***	***77***	***43***	***69***	

- In 2010, the volume of cycle movements peaks between 5:30pm and 5:39pm (8 movements) and again between 5:50pm and 5:59pm (10 movements), compared with a sharp peak between 5:30pm and 5:39pm (10 movements) in 2009.

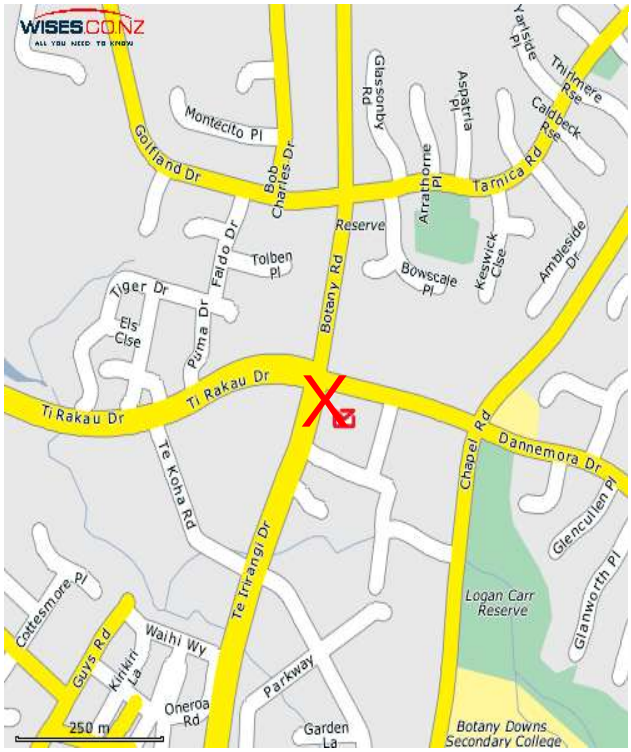
Figure 10.3: Bucklands Beach/Pakuranga Road Cyclist Frequency – Evening Peak

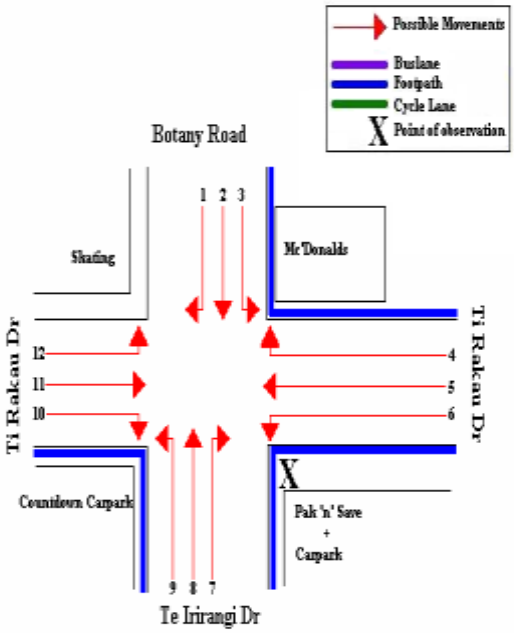


11. TE IRIRANGI DRIVE/TI RAKAU DRIVE, BOTANY DOWNS (SITE 34)

Figure 11.1 shows the possible cyclist movements at this intersection.

Figure 11.1: Cycle Movements: Te Irirangi /Ti Rakau Drive





AADT Estimate

- The AADT for this site is 112. This compares with:
  - 86 in 2009
  - 109 in 2008
  - 117 in 2007.

-

	AM	PM	TOTAL
Raw Cycle Movement Counts 2010	**30**	**48**	**78**

11.1 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 Te Irirangi/Ti Rakau Drive intersection has remained stable from 2009 at 30 movements.
- The key movement in the morning is straight along Botany Road heading south (Movement 2 = 12 cyclists).
- Morning cyclist volumes are mostly stable from last year, with the most notable change at Movement 10 (up 5 cyclists).

Table 11.1: Morning Cyclist Movements
Te Irirangi /Ti Rakau Drive 2007-2010 (n)

Movement	*2007*	*2008*	*2009*	*2010*	Change 09-10
1	13	10	6	4	-2
2	8	12	13	12	-1
3	1	0	2	1	-1
4	0	0	0	0	0
5	6	6	4	4	0
6	1	0	0	0	0
7	1	0	0	1	1
8	4	3	2	1	-1
9	1	1	0	0	0
10	1	1	0	5	5
11	0	2	3	1	-2
12	0	1	0	1	1
Total	**36**	**36**	**30**	**30**	**0**

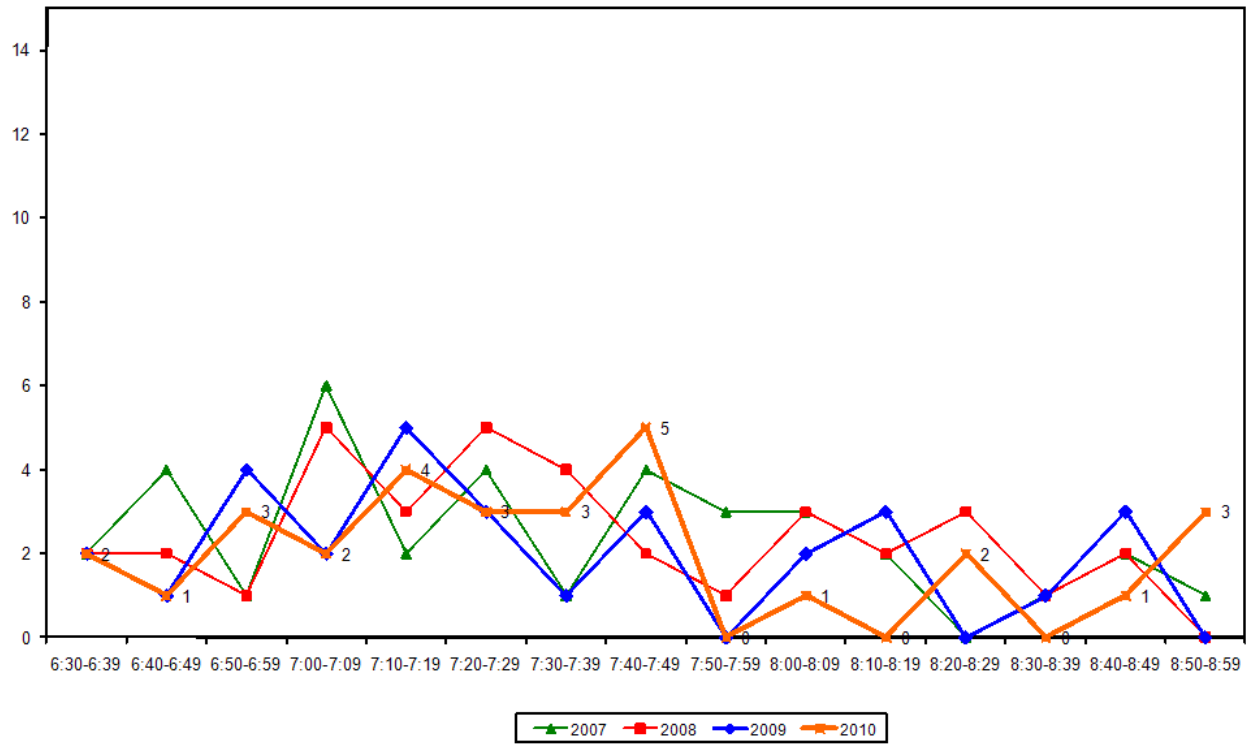
- Over the morning peak, most cyclists are adults (93 per cent, down slightly from 87 per cent last year).
- All cyclists are wearing a helmet (100 per cent, up from 90 per cent in 2009).
- Eighty-three per cent of cyclists are riding on the road (up from 70 per cent last year).

Table 11.2: Morning Cyclist Characteristics
Te Irirangi /Ti Rakau Drive 2007-2010 (%)

	2007	*2008*	*2009*	*2010*	Change 09-10
Cyclist Type					
Adult	97	94	93	87	-6
School child	3	6	7	13	6
Helmet Wearing					
Helmet on head	89	94	90	100	10
No helmet	11	6	10	0	-10
Where Riding					
Road	58	75	70	83	13
Footpath	42	25	30	17	-13
Base:	***36***	***36***	***30***	***30***	

- This year, the volume of cycle movements peaks slightly between 7:40am and 7:49am (5 cyclists) – 30 minutes later than the peak recorded in 2009.

Figure 11.2: Te Irirangi /Ti Rakau Drive Cyclist Frequency – Morning Peak



11.2 Evening Peak

Environmental Conditions

- The weather was overcast and windy throughout the evening shift with intermittent rain from 5:42pm until the end of the shift.
- There were no road works or accidents that may affect cycle counts.

Key Points

- Compared with last year, the total number of evening cycle movements observed at the Te Irirangi/Ti Rakau Drive intersection has notably increased, from 29 in 2009 to 48 movements in 2010.
- The most common evening movement is straight along Ti Rakau Drive heading east (Movement 11 = 10 cyclists) and turning right from Botany Road into Ti Rakau Drive (Movement 1 = 9 cyclists).
- The most notable change is at Movement 1 (up notably by 9 cyclists).

Table 11.3: Evening Cyclist Movements
Te Irirangi /Ti Rakau Drive 2007-2010 (n)

Movement	*2007*	*2008*	*2009*	*2010*	Change 09-10
1	3	1	0	9	9
2	11	3	4	2	-2
3	3	0	0	1	1
4	5	1	0	2	2
5	0	4	7	5	-2
6	0	0	0	0	0
7	1	2	0	2	2
8	11	16	5	6	1
9	0	0	0	1	1
10	4	0	6	3	-3
11	3	7	5	10	5
12	4	5	2	7	5
Total	**45**	**39**	**29**	**48**	**19**

- Consistent with the morning peak, the greatest share of cyclists using this intersection continue to be adults (81 per cent, compared with 90 per cent last year).
- Almost all cyclists at this site are wearing a helmet (94 per cent, stable from 97 per cent in 2009).
- Just over two-thirds of cyclists are riding on the road (69 per cent, up from 59 per cent last year).

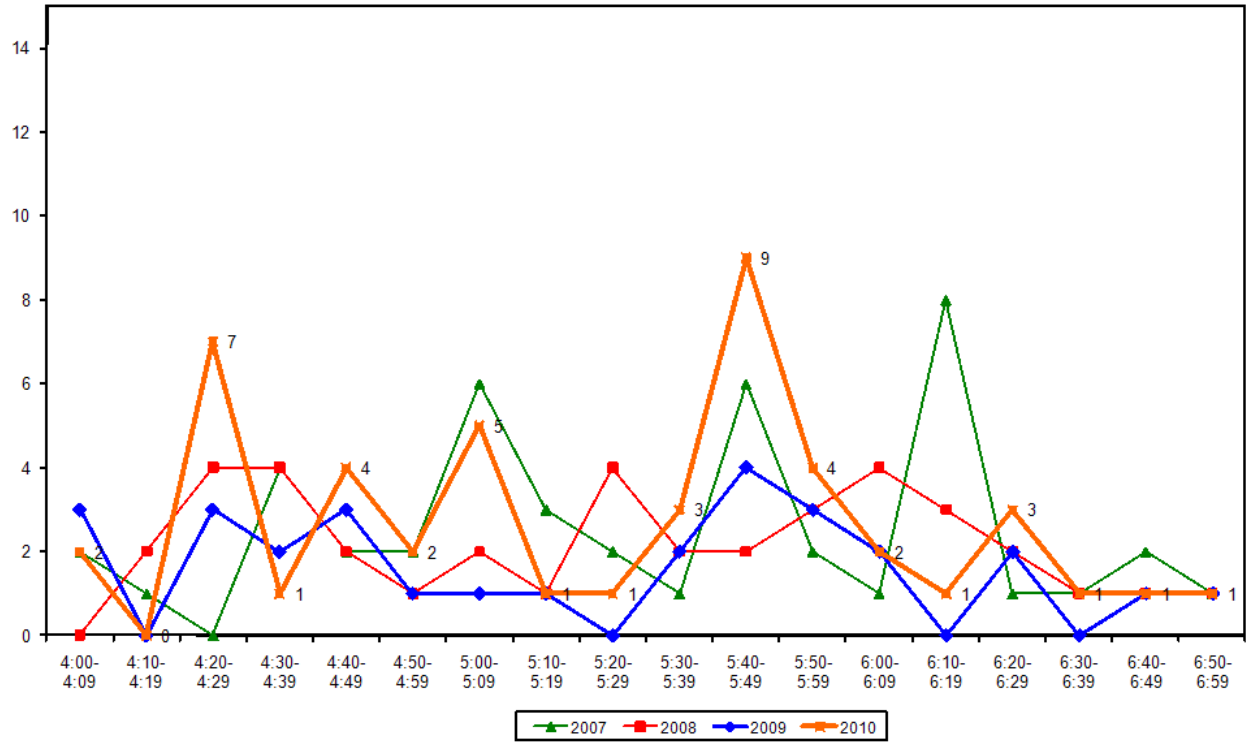
Table 11.4: Evening Cyclist Characteristics

Te Irirangi /Ti Rakau Drive 2007-2010 (%)

	2007	*2008*	*2009*	*2010*	Change 09-10
Cyclist Type					
Adult	98	95	90	81	-9
School child	2	5	10	19	9
Helmet Wearing					
Helmet on head	87	82	97	94	-3
No helmet	13	18	3	6	3
Where Riding					
Road	58	59	59	69	10
Footpath	42	41	41	31	-10
Base:	***45***	***39***	***29***	***48***	

- The volume of cycle movements peaks twice this year, between 4:20pm and 4:29pm (7 cyclists and between 5:40pm and 5:49pm (9 cyclists). This compares with a slight peak (4 movements) between 5:40pm and 5:49pm in 2009.

Figure 11.3: Te Irirangi /Ti Rakau Drive Cyclist Frequency – Evening Peak



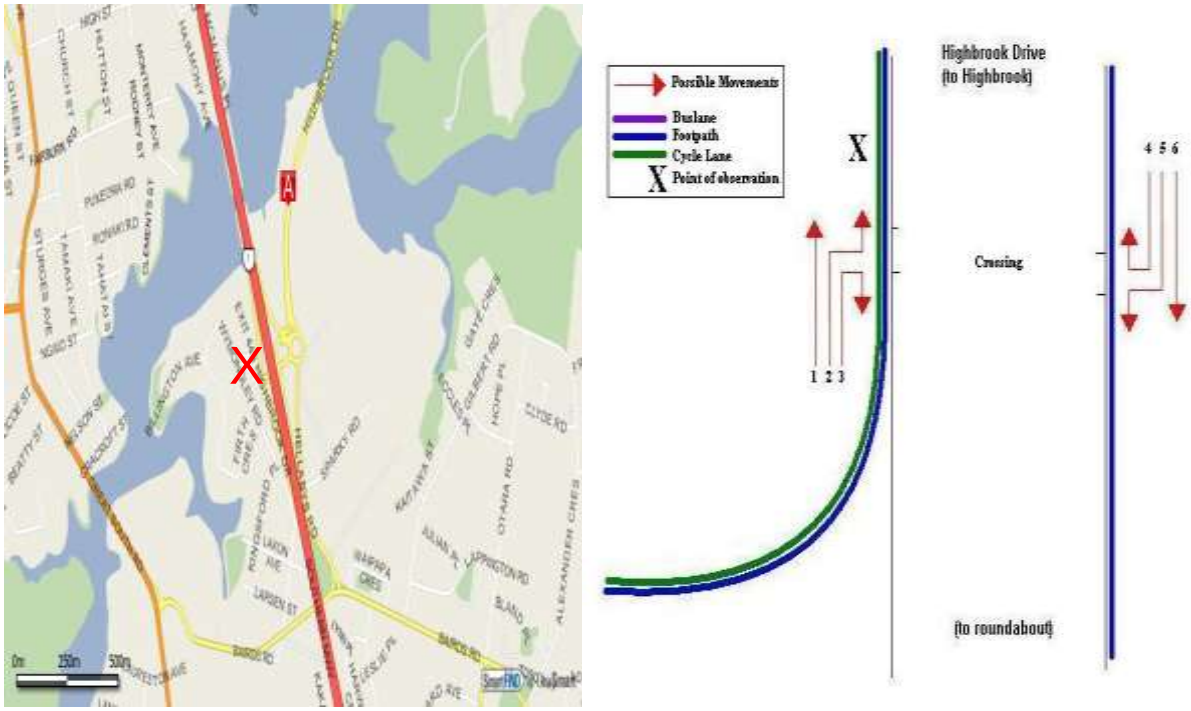
Note: In 2010, 19 per cent of the total cycle movements in the evening peak were identified as cycling in groups. Three or more cyclists were observed travelling in groups at this site at the following times:

- *Three cyclists at 4.29pm*
- *Three cyclists at 5.47pm*
- *Three cyclists at 5.48pm.*

12. HIGHBROOK DRIVE, EAST TAMAKI (SITE 71)

Figure 12.1 shows the possible cyclist movements at this intersection.

Figure 12.1: Cycle Movements: Highbrook Drive



AADT Estimate

- The AADT for this site is 59. This compares with
  - 55 in 2009.
  - 42 in 2008.

	AM	*PM*	*TOTAL*
Raw Cycle Movement Counts 2010	**27**	**13**	**40**

12.1 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

- While the level of morning cyclist traffic at the Highbrook Drive site is low, with 27 cycle movements recorded, this has increased from 20 movements in 2009.
- The most common movement in the morning is along the cycle lane heading north (Movement 1 = 8 cyclists).
- The most notable change has been at Movement 6 (down 4 cyclists).

Table 12.1: Morning Cyclist Movements

Highbrook Drive 2008-2010 (n)

Movement	*2008*	*2009*	*2010*	Change 09-10
1	5	5	8	3
2	2	2	4	2
3	2	0	1	1
4	0	2	5	3
5	3	2	4	2
6	1	9	5	-4
Total	**13**	**20**	**27**	**7**

- Over the morning peak, all cyclists are adults (100 per cent, unchanged from 2008 and 2009).
- Most cyclists are wearing a helmet (78 per cent, stable from 75 per cent last year).
- The greatest share of cyclists (60 per cent) are riding on the off-road cycleway (down notably from 20 per cent last year). One third (33 per cent) are riding on the footpath – up notably from 5 per cent last year.

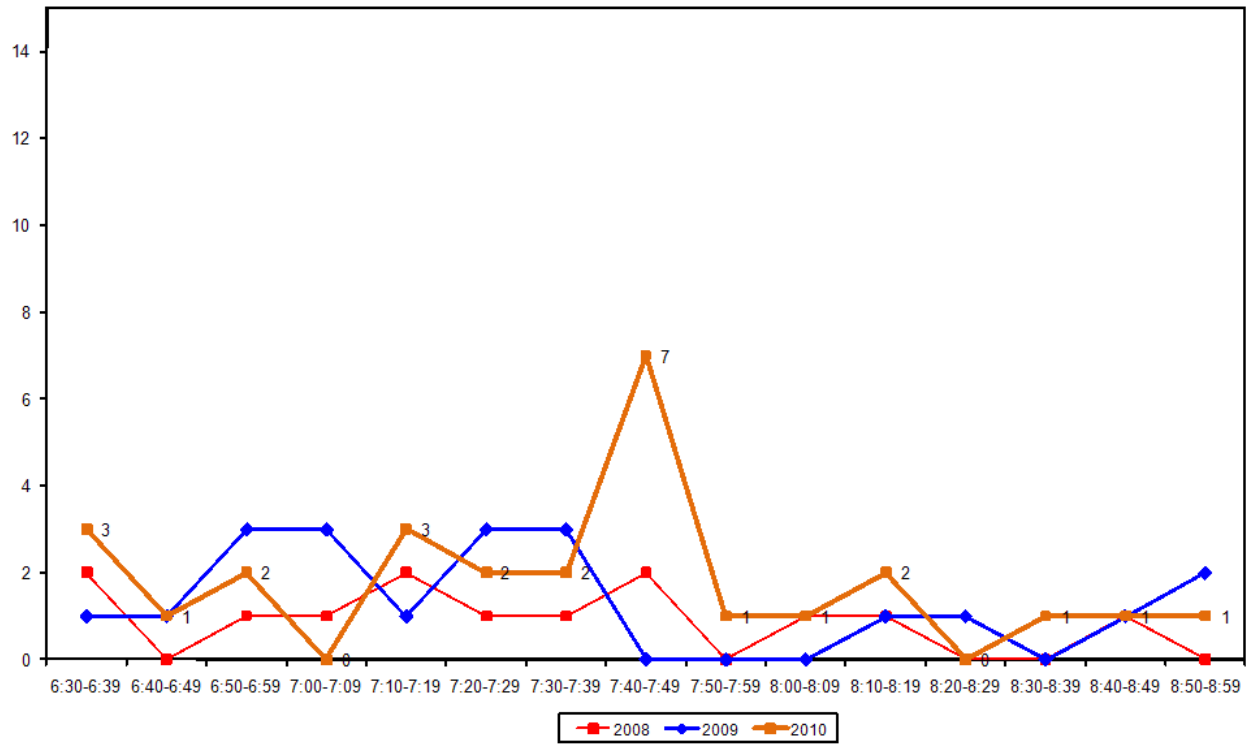
Table 12.2: Morning Cyclist Characteristics

Highbrook Drive 2008-2010 (%)

	2008	*2009*	*2010*	Change 09-10
Cyclist Type				
Adult	100	100	100	0
School child	0	0	0	0
Helmet Wearing				
Helmet on head	85	75	78	3
No helmet	15	25	22	-3
Where Riding				
Road	8	15	7	-8
Footpath	92	5	33	28
Off-road cycleway	-	80	60	-20
Base:	***13***	***20***	***27***	

- The volume of cycle movements is low over almost the entire morning shift. The notable exception to this is a peak between 7:40am and 7:49am (7 cyclists). This compares to no more than three cyclists during any ten minute interval in 2009.

Figure 12.2: Highbrook Drive Cyclist Frequency – Morning Peak



12.2 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 cycle movements observed at the Highbrook Drive intersection is low in the evening, with 13 movements recorded, down slightly from 18 movements last year.
- The most common movement in the evening is down Highbrook Drive towards the roundabout (Movement 6 = 5 cyclists).
- The most notable decrease is at Movement 3 (down 6 cyclists in 2010).

Table 12.3: Evening Cyclist Movements

Highbrook Drive 2008-2010 (n)

Movement	*2008*	*2009*	*2010*	Change 09-10
1	3	5	2	-3
2	2	0	3	3
3	0	6	0	-6
4	0	0	0	0
5	8	0	3	3
6	3	7	5	-2
Total	**16**	**18**	**13**	**-5**

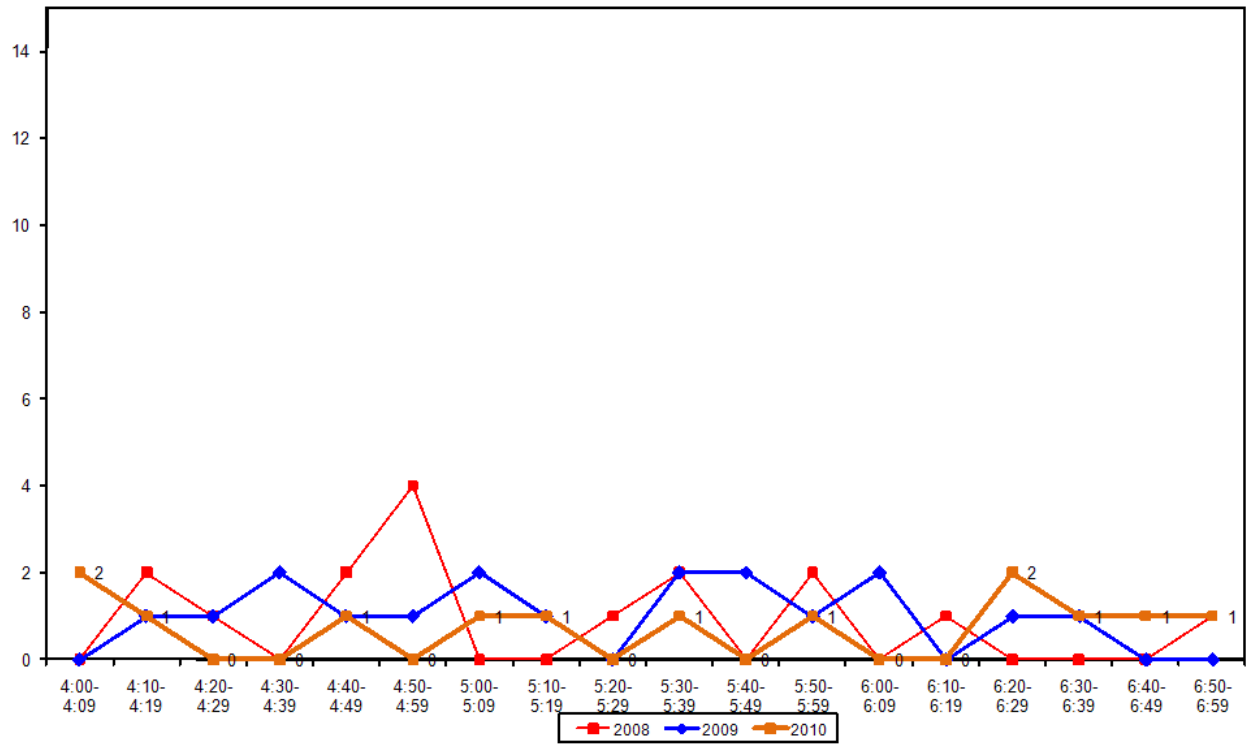
- Consistent with the morning peak, all cyclists using this intersection are adults (100 per cent, unchanged from 2008 and 2009).
- Notably fewer cyclists at this site are wearing a helmet this year (62 per cent, down notably from 89 per cent in 2009).
- Most of evening peak cyclists were observed using the footpath (54 per cent, up notably from 22 per cent last year) while the remaining 46 per cent used the off-road cycleway.

Table 12.4: Evening Cyclist Characteristics
Highbrook Drive 2008-2010 (%)

	2008	*2009*	*2010*	Change 09-10
Cyclist Type				
Adult	100	100	100	0
School child	0	0	0	0
Helmet Wearing				
Helmet on head	81	89	62	-27
No helmet	19	11	38	27
Where Riding				
Road	6	11	0	-11
Footpath	94	22	54	32
Off-road cycleway	-	67	46	-21
Base:	***16***	***18***	***13***	

- The volume of cycle movements is low over the entire evening peak, with no more than two cyclists recorded over any ten minute interval. This is consistent with last year's observation.

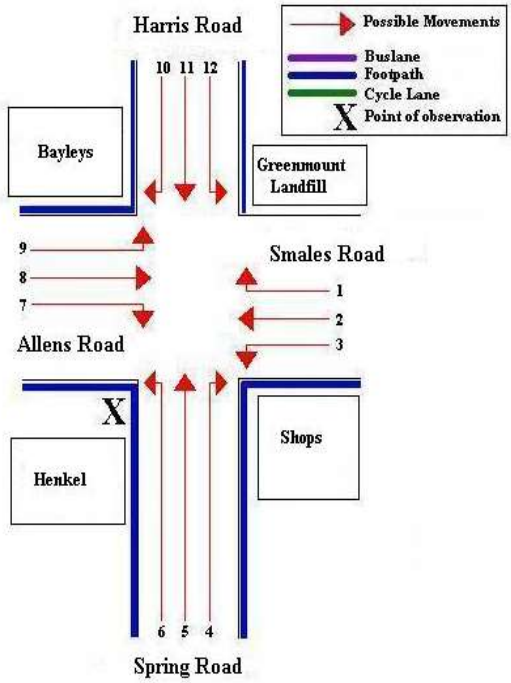
Figure 12.3: Highbrook Drive Cyclist Frequency – Evening Peak



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

Figure 13.1 shows the possible cyclist movements at this intersection.

Figure 13.1: Cycle Movements: Harris/Smales Road



Note: This site was monitored for the first time in 2009. Consequently, only 2009 and 2010 results are available for comparison.

AADT Estimate

- The AADT for this site is 89. This compares with 88 in 2009.

	AM	*PM*	*TOTAL*
Raw Cycle Movement Counts 2010	**25**	**37**	**62**

13.1 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

- Cyclist volumes at the Harris Road/Smales Road site over the morning monitoring period had declined since last year (25 cyclists, down from 35 in 2009).
- The key movements in the morning are heading south along Harris Road into Spring Road (Movement 11 = 6 cyclists) and heading west along Smales Road into Allens Road (Movement 2 = 5 cyclists).
- The most notable change in cyclist volumes was at Movement 5 (down 7 cyclists from 2009).

Table 13.1: Morning Cyclist Movements
Harris/Smales Road 2009 - 2010 (n)

Movement	2009	*2010*	Change 09-10
1	2	0	-2
2	8	5	-3
3	3	2	-1
4	1	0	-1
5	9	2	-7
6	1	3	2
7	0	2	2
8	0	0	0
9	2	1	-1
10	2	2	0
11	4	6	2
12	3	2	-1
Total	**35**	**25**	**-10**

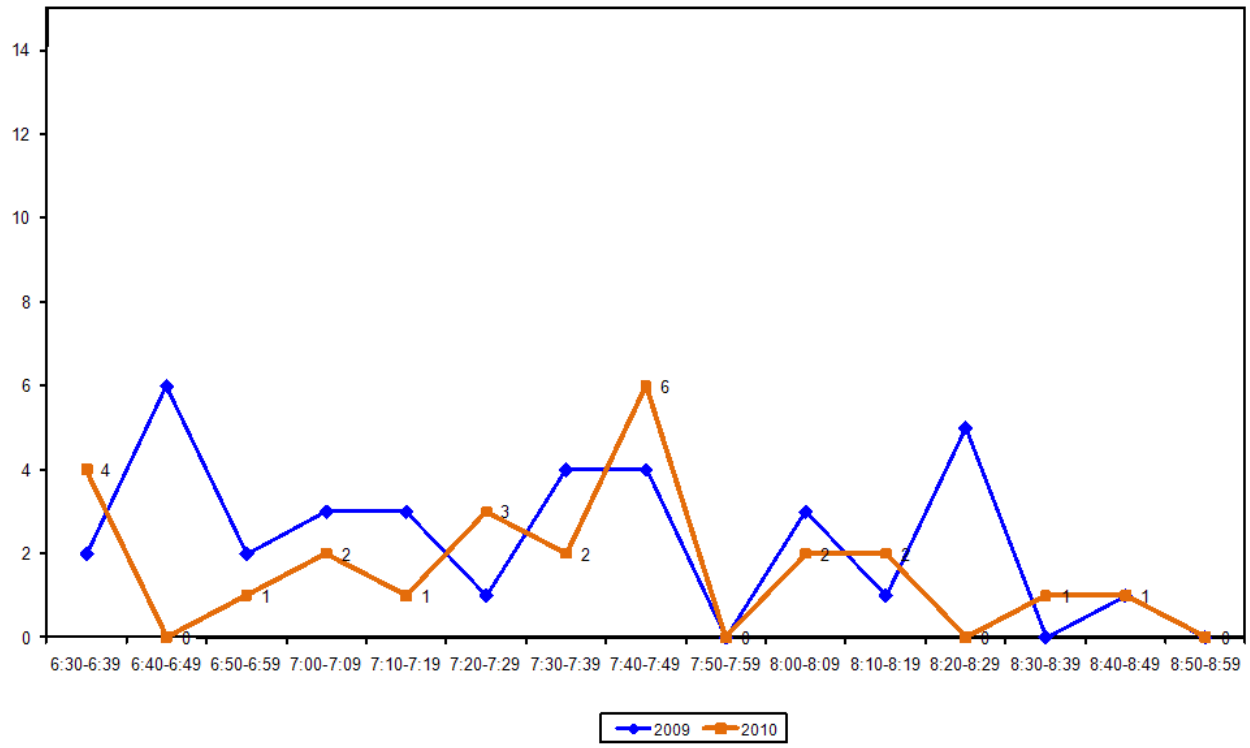
- Over the morning peak, all cyclists riding through the Harris/Smales Road intersection are adults (up slightly from 97 per cent last year).
- Most cyclists are wearing a helmet (88 per cent, up slightly from 83 per cent last year).
- Approximately two-thirds of cyclists are riding on the road (64 per cent, up from 51 per cent in 2009).

Table 13.2: Morning Cyclist Characteristics
Harris/Smales Road 2009 - 2010 (%)

	2009	***2010***	**Change 09-10**
Cyclist Type			
Adult	97	100	3
School child	3	0	-3
Helmet Wearing			
Helmet on head	83	88	5
No helmet	17	12	-5
Where Riding			
Road	51	64	13
Footpath	49	36	-13
Base:	***35***	***25***	

- The volume of morning cycle movements peaks between 7:40am and 7:49am (6 movements). This compares to slight peaks between 6:40am and 6:49am (6 cyclists) and 8:20am and 8:29am (5 cyclists) in 2009.

Figure 13.2: Harris/Smales Road Cyclist Frequency – Morning Peak



13.2 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

- Evening cyclist volumes at Harris/Smales Road intersection are moderate when compared with other Manukau city sites, with 37 movements recorded in 2010 (up from 25 movements last year).
- The most common movements in the evening are heading east along Allens Road into Smales Road (Movement 8 = 9 cyclists) and heading south along Harris Road into Springs Road (Movement 11 = 8 cyclists).
- Cyclist volumes have most notably increased at Movement 8 (up 5 cyclists from 2009).

Table 13.3: Evening Cyclist Movements
Harris/Smales Road 2009 - 2010 (n)

Movement	2009	*2010*	Change 09-10
1	2	3	1
2	1	1	0
3	0	0	0
4	3	2	-1
5	3	6	3
6	0	0	0
7	3	6	3
8	4	9	5
9	1	1	0
10	0	1	1
11	6	8	2
12	2	0	-2
Total	**25**	**37**	**12**

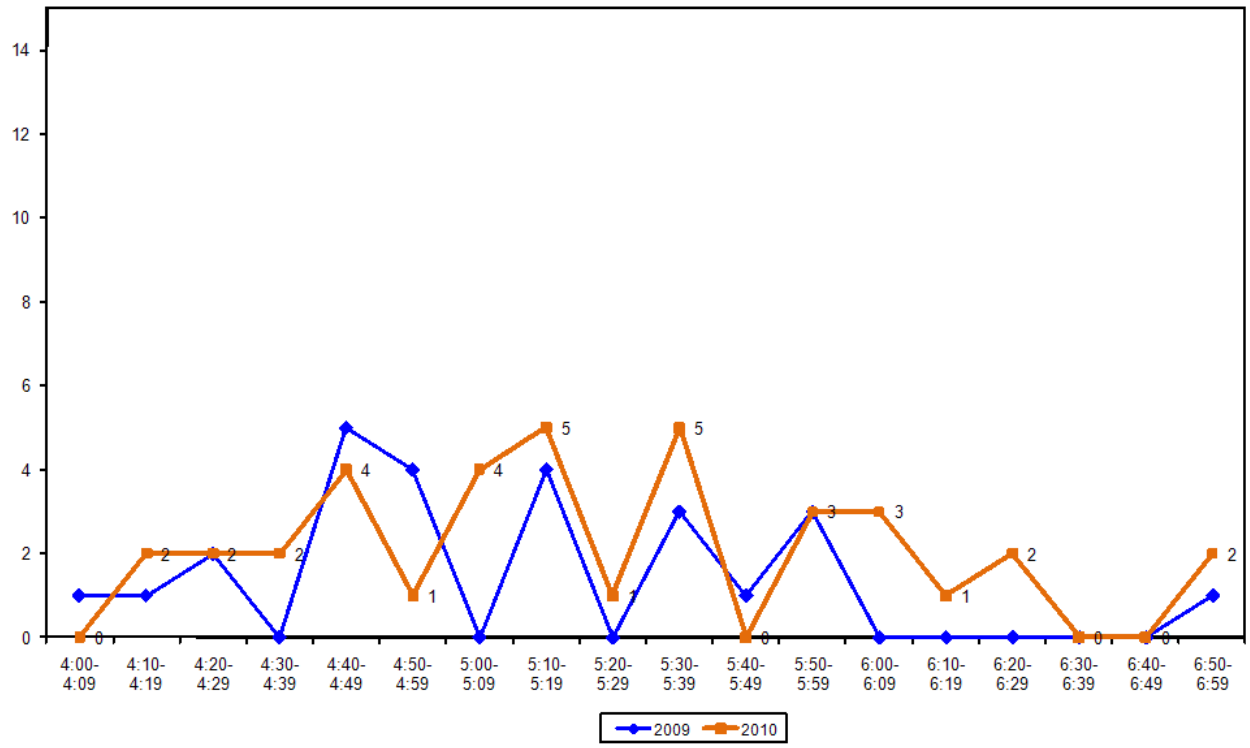
- Almost all evening cyclists at this site are adults (95 per cent, stable from 96 per cent at the previous measure).
- Most cyclists are wearing a helmet (95 per cent, up from 84 per cent last year).
- Approximately two in three cyclists are riding on the road (65 per cent, up from 56 per cent in 2009).

Table 13.4: Evening Cyclist Characteristics
Harris/Smales Road 2009 - 2010 (%)

	2009	***2010***	**Change 09-10**
Cyclist Type			
Adult	96	95	-1
School child	4	5	1
Helmet Wearing			
Helmet on head	84	95	11
No helmet	16	5	-11
Where Riding			
Road	56	65	9
Footpath	44	35	-9
Base:	***25***	***37***	

- Cyclist numbers vary throughout the evening shift and peak slightly between 5:10pm and 5:19pm (5 cyclists) and again between 5:30pm and 5:39pm (also 5 cyclists). This compares to a slight peak between 4:40pm and 4:49pm (5 movements) in 2009.

Figure 13.3: Harris/Smales Road Cyclist Frequency – Evening Peak

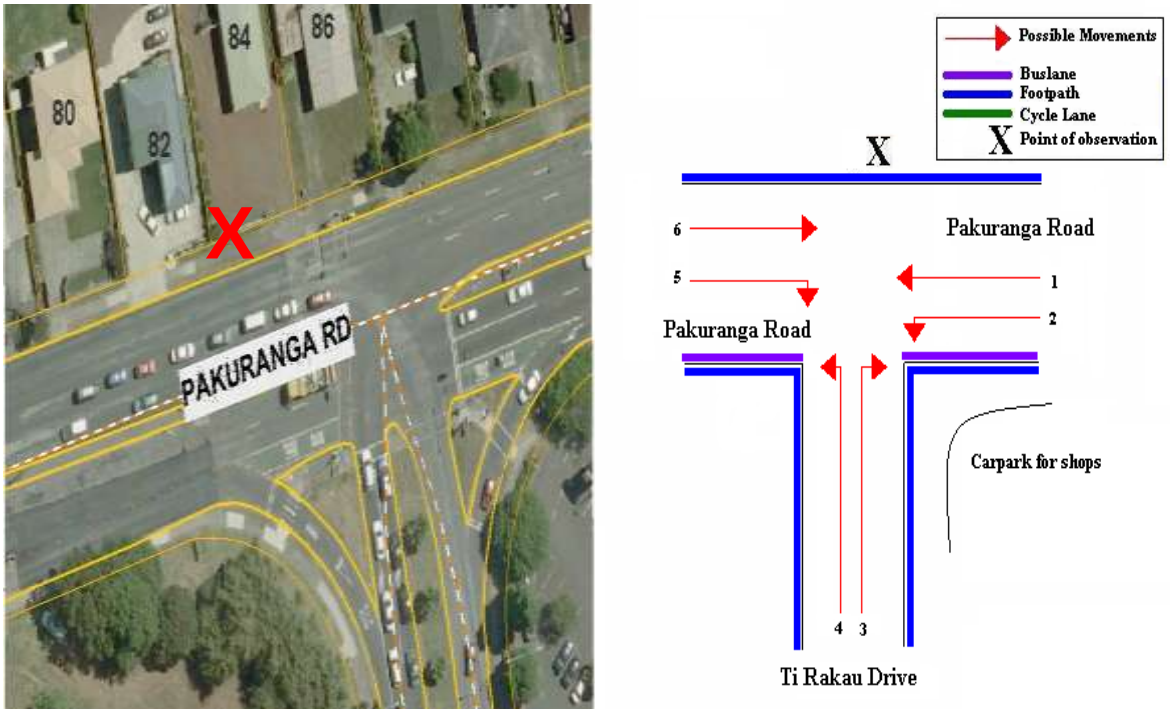


Note: In 2010, three cyclists were observed riding as a group at 6.00pm. This comprises eight per cent of the total cycle movements in the evening peak in 2010.

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

Figure 14.1 shows the possible cyclist movements at this intersection.

Figure 14.1: Cycle Movements: Pakuranga Road/Ti Rakau Drive



Note: This site was monitored for the first time in 2009. Consequently, only 2009 and 2010 results are available for comparison.

AADT Estimate

- The AADT for this site is 234. This compares with 176 in 2009.

	AM	*PM*	*TOTAL*
Raw Cycle Movement Counts 2010	**70**	**92**	**162**

14.1 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

- Of the 15 Manukau city sites, the Pakuranga Road/Ti Rakau Drive intersection has the highest volume of morning cycle movements, with 70 cyclists recorded over the monitoring period (up notably from 46 cyclists in 2009).
- The key movements in the morning are turning right from Pakuranga Road into Ti Rakau Drive (Movement 5 = 30 movements) and riding straight along Pakuranga Road heading west (Movement 1 = 19 cyclists).
- Cyclist volumes at this site have most notably increased at Movement 1 (up 9 cyclists) and Movement 5 (up 8 cyclists).

Table 14.1: Morning Cyclist Movements
Pakuranga Road/Ti Rakau Drive 2009 - 2010 (n)

Movement	2009	*2010*	Change 09-10
1	10	19	9
2	4	0	-4
3	0	0	0
4	2	8	6
5	22	30	8
6	8	13	5
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
Total	**46**	**70**	**24**

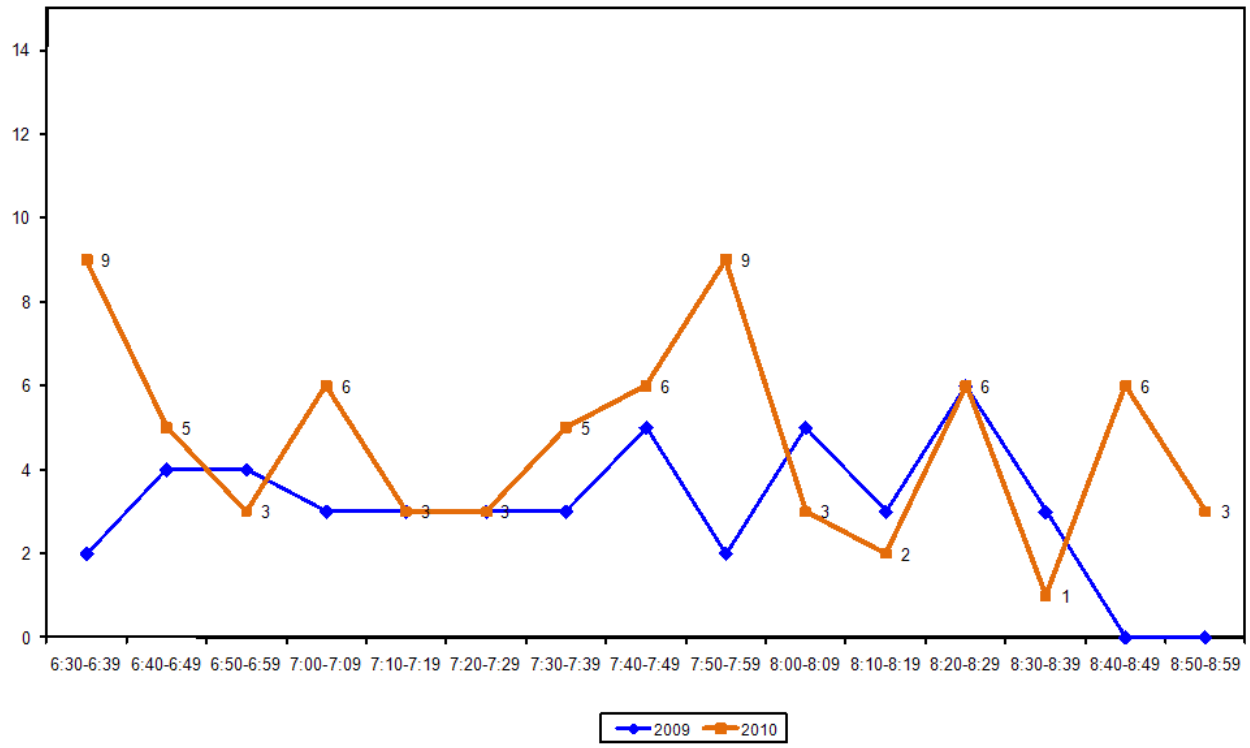
- Over the morning peak, most cyclists riding through the Pakuranga Road/Ti Rakau Drive intersection are adults (96 per cent, up from 85 per cent last year).
- Most cyclists are wearing a helmet (97 per cent, stable from 96 per cent last year).
- Approximately four in five cyclists are riding on the road (79 per cent, up notably from 63 per cent in 2009).

Table 14.2: Morning Cyclist Characteristics
Pakuranga Road/Ti Rakau Drive 2009 - 2010 (%)

	2009	***2010***	**Change 09-10**
Cyclist Type			
Adult	85	96	11
School child	15	4	-11
Helmet Wearing			
Helmet on head	96	97	1
No helmet	4	3	-1
Where Riding			
Road	63	79	16
Footpath	37	21	-16
Base:	***46***	***70***	

- The volume of morning cycle movements is variable throughout the morning monitoring period. A slight peak occurs at the start of the shift between 6:30am and 6:39am (9 cyclists) and again between 7:50am and 7:59am (9 cyclists). This compares to mostly stable cyclist volumes throughout the monitoring period in 2009, with a slight peak between 8:20am and 8:29am (6 movements).

Figure 14.2: Pakuranga Road/Ti Rakau Drive Cyclist Frequency – Morning Peak



14.2 Evening Peak

Environmental Conditions

- The weather was fine at the start of the evening shift, with rain developing at 5:50pm which persisted throughout the rest of the evening shift.
- There were no road works or accidents that may affect cycle counts.

Key Points

- The volume of evening cycle movements at this site is the highest of the monitored sites in Manukau city (92 cyclists, up notably from 77 cyclists in 2009).
- The most common movements in the evening are riding straight along Pakuranga Road heading east (Movement 6 = 33 cyclists) and west (Movement 1 = 32 cyclists).
- Cyclist volumes at this site have most notably decreased at Movement 4 (down 15 cyclists) and most notably increased at Movement 1 (up 13 cyclists).

Table 14.3: Evening Cyclist Movements
Pakuranga Road/Ti Rakau Drive 2009 - 2010 (n)

Movement	2009	*2010*	Change 09-10
1	19	32	13
2	1	0	-1
3	1	2	1
4	24	9	-15
5	11	16	5
6	21	33	12
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
Total	**77**	**92**	**15**

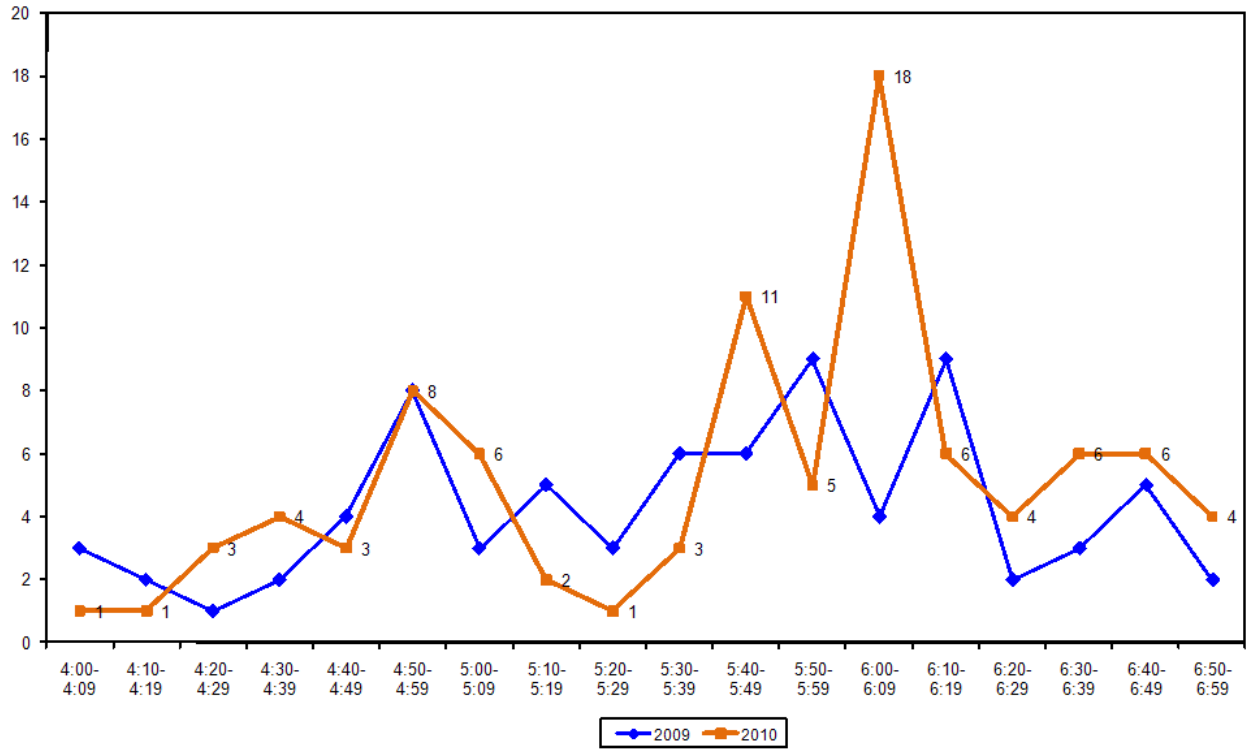
- Most evening cyclists using this intersection are adults (96 per cent, stable from 94 per cent last year).
- Almost all cyclists are wearing a helmet (98 per cent, up from 87 per cent in 2009).
- Approximately three in four cyclists are riding on the road (74 per cent, up from 65 per cent at the previous measure).

Table 14.4: Evening Cyclist Characteristics
Pakuranga Road/Ti Rakau Drive 2009 - 2010 (%)

	2009	***2010***	**Change 09-10**
Cyclist Type			
Adult	94	96	2
School child	6	4	-2
Helmet Wearing			
Helmet on head	87	98	11
No helmet	13	2	-11
Where Riding			
Road	65	74	9
Footpath	35	26	-9
Base:	***77***	***92***	

- Evening cyclist volumes increase over the evening shift to peak between 6:00pm and 6:09pm (18 cyclists. Note that this includes 14 cyclists riding together as a group). This compares to three peaks in the evening shift observed in 2009, between 4:50pm and 4:59pm (8 movements), 5:50pm and 5:59pm (9 movements) and between 6:10pm and 6:19pm (9 movements).

Figure 14.3: Pakuranga Road/Ti Rakau Drive Cyclist Frequency – Evening Peak

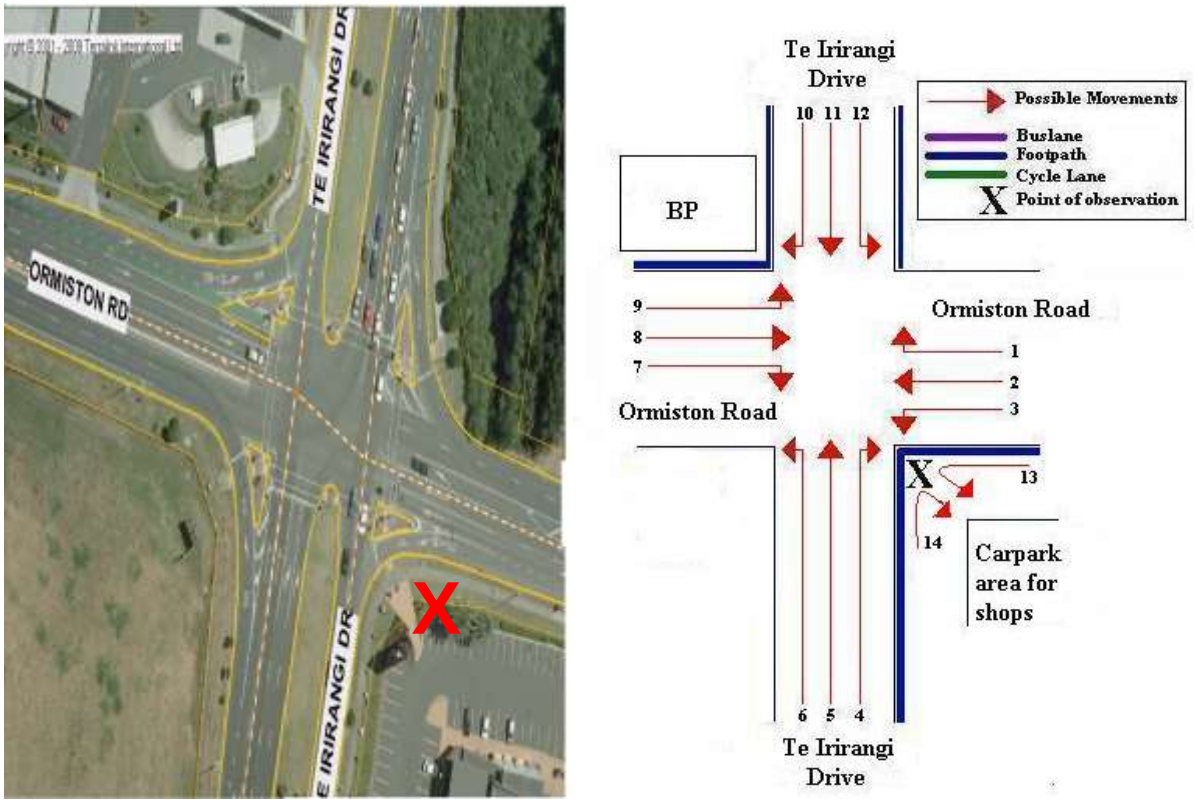


Note: In 2010, 14 cyclists were observed riding as a group at 6.00pm. This comprises 15 per cent of the total cycle movements in the evening peak in 2010.

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

Figure 15.1 shows the possible cyclist movements at this intersection.

Figure 15.1: Cycle Movements: Te Irirangi Drive/Ormiston Road



Note: This site was monitored for the first time in 2009. Consequently, only 2009 and 2010 results are available for comparison.

AADT Estimate

- The AADT for this site is 95. This compares with 47 in 2009.
-

	AM	PM	TOTAL
Raw Cycle Movement Counts 2010	**25**	**41**	**66**

15.1 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 25 cycle movements recorded (up from 13 movements in 2009).
- The key movement in the morning is riding straight along Te Irirangi Drive heading south (Movement 11 = 12 cyclists).
- Morning cyclist volumes have most notably increased at Movement 11 (up 8 cyclists).

Table 15.1: Morning Cyclist Movements
Te Irirangi Drive/Ormiston Road 2009 - 2010 (n)

Movement	2009	*2010*	Change 09-10
1	4	1	-3
2	1	2	1
3	0	3	3
4	0	0	0
5	4	3	-1
6	0	0	0
7	0	0	0
8	0	3	3
9	0	0	0
10	0	1	1
11	4	12	8
12	0	0	0
Total	**13**	**25**	**12**

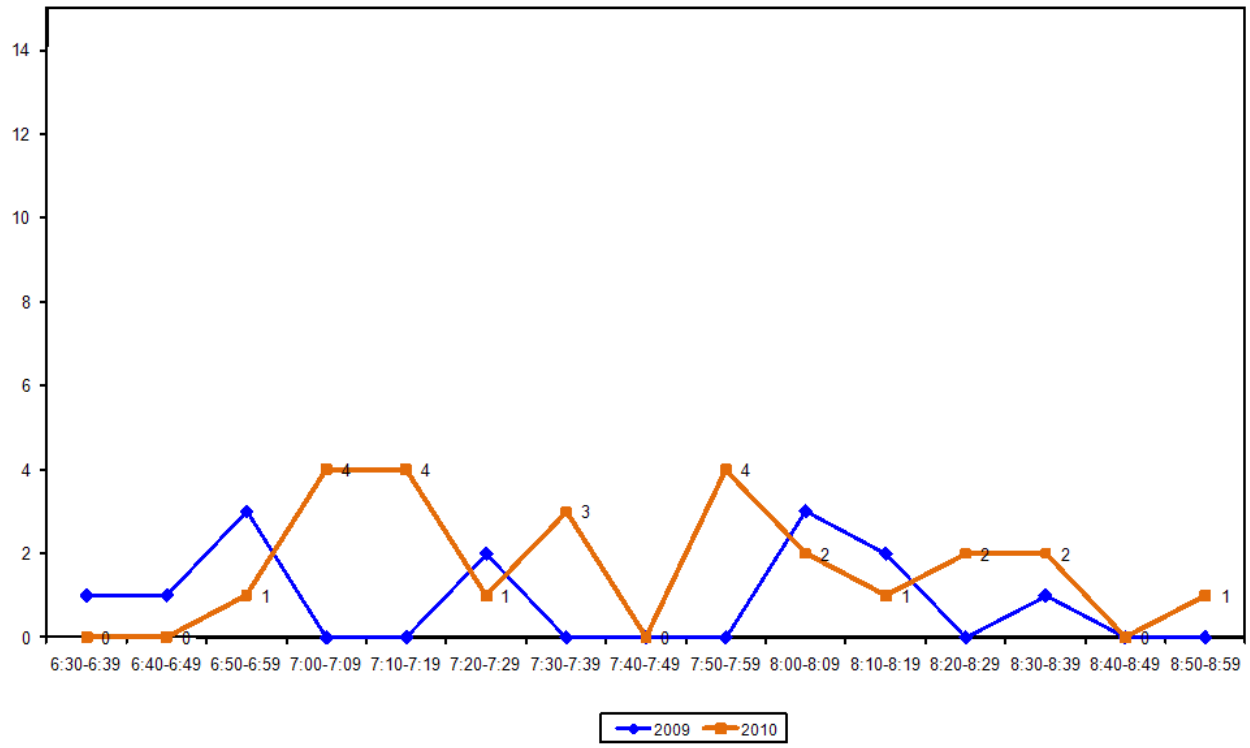
- Over the morning peak, the majority of cyclists riding through this intersection are adults (80 per cent, up from 69 per cent last year).
- Most cyclists are wearing a helmet (92 per cent up from 85 per cent last year).
- The majority of cyclists are riding on the road (64 per cent, down slightly from 69 per cent at the previous measure).

Table 15.2: Morning Cyclist Characteristics
Te Irirangi Drive/Ormiston Road 2009 - 2010 (%)

	2009	***2010***	**Change 09-10**
Cyclist Type			
Adult	69	80	11
School child	31	20	-11
Helmet Wearing			
Helmet on head	85	92	7
No helmet	15	8	-7
Where Riding			
Road	69	64	-5
Footpath	31	36	5
Base:	***13***	***25***	

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

Figure 15.2: Te Irirangi Drive/Ormiston Road Cyclist Frequency – Morning Peak



15.2 Evening Peak

Environmental Conditions

- The weather was overcast at the start of the evening shift with drizzle developing at 5:55pm which persisted through the remainder of the evening shift.
- There were no road works or accidents that may affect cycle counts.

Key Points

- Evening cyclist volumes at Te Irirangi Drive/Ormiston Road intersection have increased notably since 2009, from 20 movements to 41 movements this year.
- The most common movement in the evening is riding straight along Te Irirangi Drive heading south (Movement 11 = 20 cyclists).
- Since 2009, evening cyclist volumes have most notably increased at Movement 11 (up 7 cyclists).

Table 15.3: Evening Cyclist Movements
Te Irirangi Drive/Ormiston Road 2009 - 2010 (n)

Movement	2009	*2010*	Change 09-10
1	0	1	1
2	1	4	3
3	0	0	0
4	0	0	0
5	2	8	6
6	0	0	0
7	1	0	-1
8	1	6	5
9	1	1	0
10	0	0	0
11	13	20	7
12	1	1	0
Total	**20**	**41**	**21**

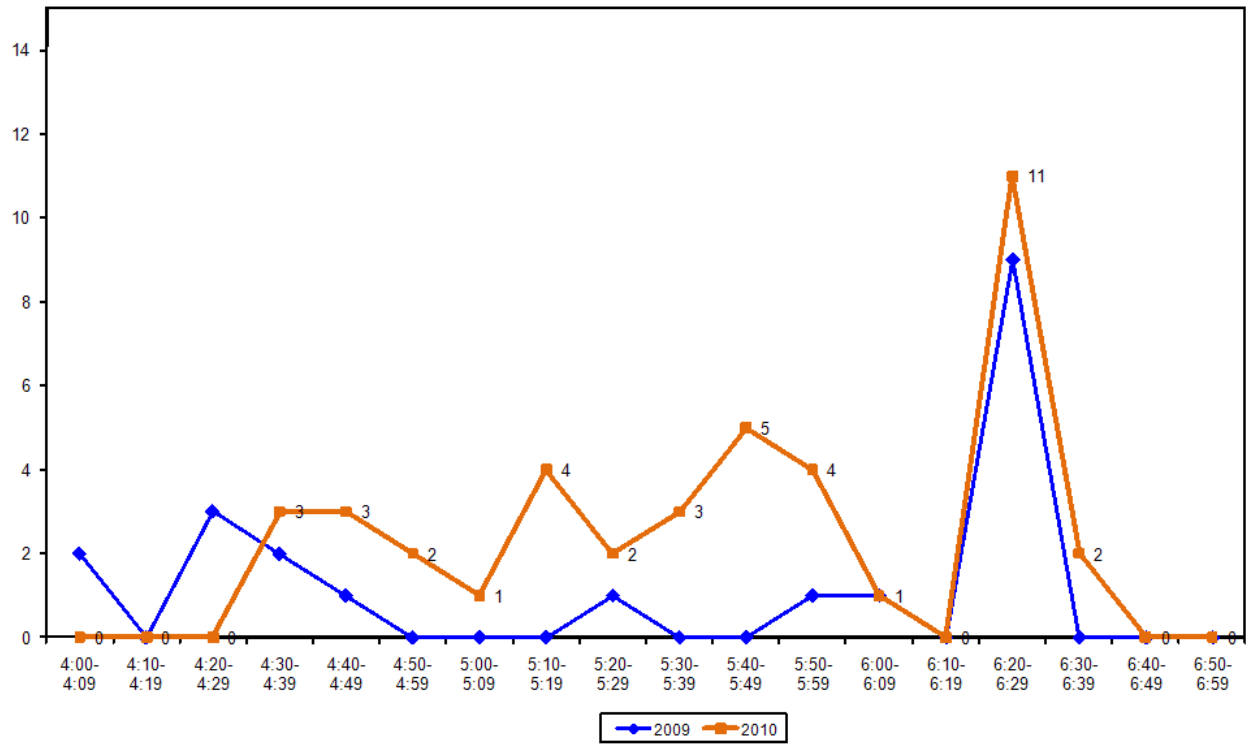
- Most evening cyclists using this site are adults (83 per cent, down from 95 per cent at the previous measure).
- Approximately four in five cyclists are wearing a helmet (78 per cent, down notably from 95 per cent last year).
- The majority of cyclists are riding on the road (76 per cent, down notably from 95 per cent in 2009).

Table 15.4: Evening Cyclist Characteristics
Te Irirangi Drive/Ormiston Road 2009 - 2010 (%)

	2009	***2010***	**Change 09-10**
Cyclist Type			
Adult	95	83	-12
School child	5	17	12
Helmet Wearing			
Helmet on head	95	78	-17
No helmet	5	22	17
Where Riding			
Road	95	76	-19
Footpath	5	24	19
Base:	***20***	***41***	

- Cyclist numbers are moderate throughout most of the evening shift, with a sharp peak observed between 6:20pm and 6:29pm (11 cyclists. Note that all 11 cyclists were recorded as riding together as a group). This is the same time as the sharp peak observed in 2009 (where 7 of the 9 cyclists were riding together as a group).

Figure 15.3: Te Irirangi Drive/Ormiston Road Cyclist Frequency – Evening Peak



Note: In 2010, 11 cyclists were observed riding as a group at 6.28pm. This comprises 27 per cent of the total cycle movements in the evening peak in 2010.

16. HALF MOON BAY FERRY WHARF

Key Points

- In the morning, 2 cycles were observed at the Half Moon Bay Ferry Wharf at 6.10am whereas no cycles were observed at 9.10am.
- In the afternoon, one cycle was recorded at the Half Moon Bay Ferry Wharf at 3.30pm while no cycles were observed at 7.10pm.

17. PINE HARBOUR FERRY WHARF

Key Points

- Four cycles were recorded at the Pine Harbour Ferry Wharf at 10am.

18. SCHOOL BIKE SHED COUNT - MANUKAU CITY

Background Information

- A total of 44 schools were contacted in Manukau city. Of the 30 schools that responded to the survey (68 per cent), most schools surveyed have no policies that restrict students cycling to school.
- The only exceptions were
  - Somerville Intermediate School which requires students to be issued with a bike licence. This is received upon a confirmation letter from parents stating they know the road code, can ride confidently on the road and have a roadworthy bike and helmet.
  - Elim Christian College, which allows only Year 7 or above to cycle to school.
- No school surveyed reported events or issues that may affect the cycle counts.
- The designated count day was Tuesday 9th of March[13].

Key Points

- Among the surveyed schools, of those eligible to cycle at school, on average, one per cent of students are cycling to their schools. This is unchanged from both 2008 and 2009.
- Across the 30 schools that responded, 304 students were reported to cycle to school.
- This year, Bucklands Beach Intermediate reported the highest share of cyclists – 8 per cent of all eligible students currently cycling. This is up from 5 per cent in 2009.
- Of the 30 schools that responded, 12 (40 per cent) had no students cycling to school. This compares with 19 per cent in 2009.

[13] The following schools conducted their counts on alternative days
- Papatoetoe Intermediate School, Tyndale Park Christian School – Thursday 4th March
- Clover Park Middle School, Edgewater College, James Cook High School, Somerville Intermediate School, Te Whanau o Tupuranga – Monday 15th March
- Greenmeadows Intermediate School, Tangaroa College – Tuesday 16th March
- Al-Madinah School, Bucklands Beach Intermediate, Elim Christian College, Manukau Christian School, Sir Douglas Bader Intermediate School, Southern Cross Campus, Te Wharekura o Manurewa – Friday 19th March

Table 17.1 shows the results of the 30 schools surveyed in Manukau city.

Table 17.1: Summary Table Of School Bike Count 2007-2010 (n)

School Name	*Year Levels*	*School Roll Eligible To Cycle*	*No. of Cycles Counted*	*Cyclists as share of those eligible[14] (2010)*	*Cyclists as share of those eligible[15] (2009)*	*Cyclists as share of those eligible (2008)*	*Cyclists as share of those eligible (2007)*
Bucklands Beach Intermediate	Intermediate	754	63	8%	5%	4%	-
Farm Cove Intermediate School	Intermediate	600	41	7%	9%	6%	4%
Mission Heights Junior College	Intermediate	520	27	5%	3%	-	-
Somerville Intermediate School[17]	Intermediate	940	28	3%	3%	4%	4%
Elim Christian College[16]	Composite	541	10	2%	6%	5%	-
kedgley Intermediate School	Intermediate	730	15	2%	2%	-	-
Pakuranga College	Secondary	2100	32	2%	2%	3%	-
Edgewater College	Secondary	924	19	2%	2%	2%	-
Papatoetoe Intermediate School	Intermediate	865	13	2%	1%	-	-
Greenmeadows Intermediate	Intermediate	391	6	2%	0%	5%	3%
Mangere College	Secondary	860	6	1%	1%	-	-
Alfriston College	Secondary	1323	7	1%	1%	2%	-
Sancta Maria College	Intermediate/Secondary	920	5	1%	1%	1%	2%
Weymouth Intermediate School	Intermediate	404	4	1%	1%	1%	2%
Manurewa High School	Secondary	1976	14	1%	0%	1%	2%

[14] 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.
[15] 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.
[16] 50 Students away at school camp on count day. May have added an extra 5-10 cyclists to the count.
[17] Two classes away from school at EOTC activity.

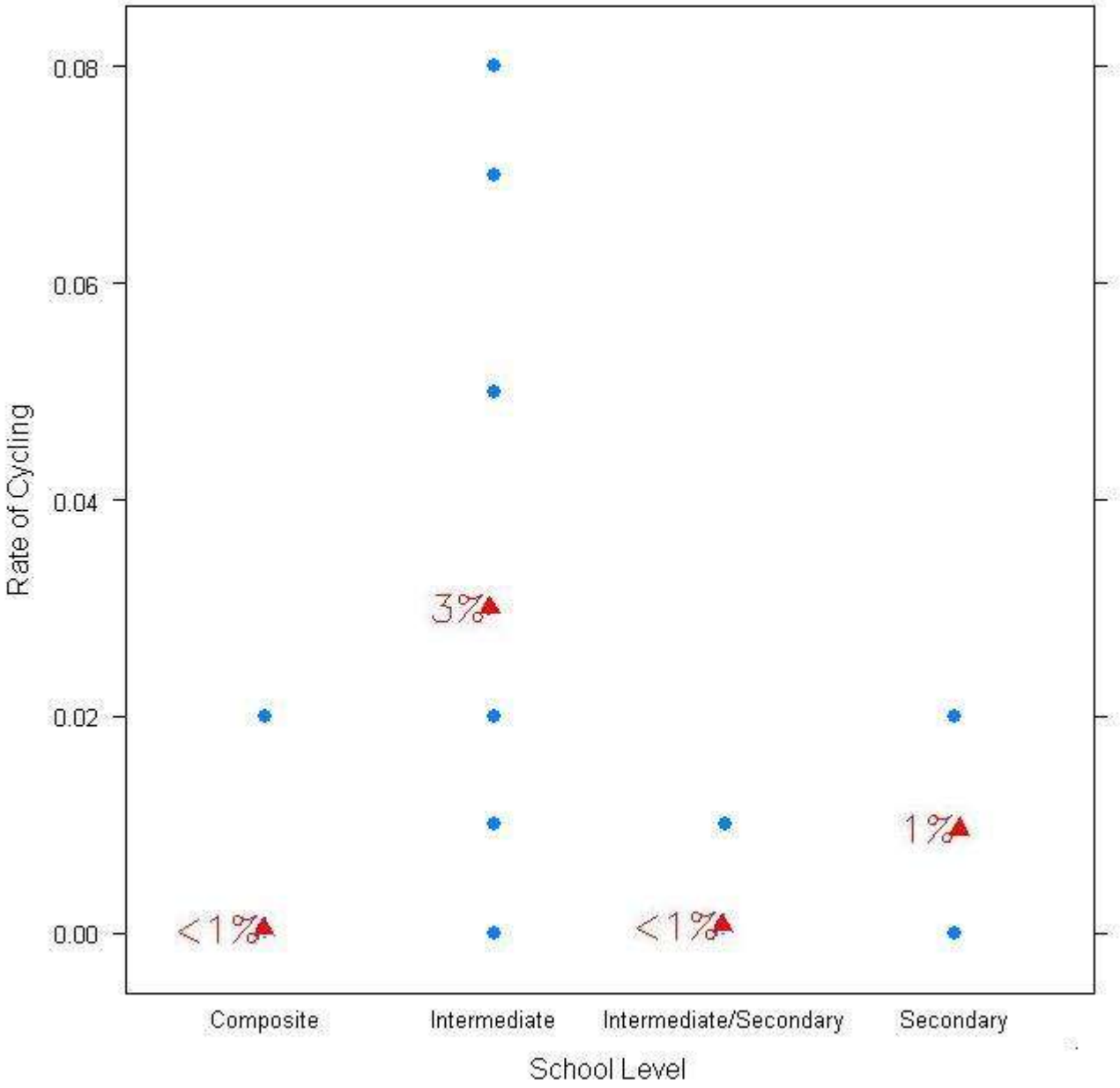
School Name	*Year Levels*	*School Roll Eligible To Cycle*	*No. of Cycles Counted*	*Cyclists as share of those eligible[14] (2010)*	*Cyclists as share of those eligible[15] (2009)*	*Cyclists as share of those eligible (2008)*	*Cyclists as share of those eligible (2007)*
Saint Kentigern College	Intermediate/Secondary	1661	7	<1%	1%	-	-
James Cook High School	Secondary	1400	6	<1%	0%	<1%	-
Sir Douglas Bader Intermediate School	Intermediate	219	1	<1%	0%	<1%	0%
Saint Kentigern School for Girls-Corran	Intermediate/Secondary	101	0	0%	-	-	-
Te Kura Kaupapa Maori a Rohe Mangere	Composite	170	0	0%	-	-	-
Te Wharekura o Manurewa	Composite	34	0	0%	-	-	-
Tangaroa College	Secondary	1200	0	0%	-	0%	-
Manukau Christian School	Composite	104	0	0%	2%	0%	4%
Aorere College	Secondary	1553	0	0%	0%	-	-
Sir Edmund Hillary Collegiate Middle School	Intermediate	249	0	0%	0%	-	-
Te Whanau o Tupuranga	Intermediate/Secondary	205	0	0%	0%	-	-
Al-Madinah School	Composite	457	0	0%	0%	0%	-
Clover Park Middle School	Intermediate	140	0	0%	0%	0%	-
Southern Cross Campus	Composite	1741	0	0%	0%	0%	-
Tyndale Park Christian School	Composite	138	0	0%	0%	0%	0%
Total		**23220**	**304**	**1%**	**1%**	**1%**	**2%**

- Table 17.2 and Figure 17.1 illustrate the rates of cycling to school at different school levels. Rates of cycling to school are highest among intermediate schools (3 per cent, unchanged from last year) and lowest for composite and combined intermediate and secondary schools (<1 per cent, down from 2009).

Table 17.2: Summary Table Of School Bike Count by Year Levels 2007-2010 (%)

Year Levels	*Number of Schools Responded in 2010*	*Cyclists as share of those eligible - 2007*	*Cyclists as share of those eligible - 2008*	*Cyclists as share of those eligible - 2009*	*Cyclists as share of those eligible – 2010*	**Change 09-10**
Intermediate	11	3	3	3	**3**	0
Secondary	8	2	1	1	**1**	0
Composite	7	1	1	1	**<1**	0
Intermediate/Secondary	4	1	<1	1	**<1**	0
Total	**30**	**2**	**1**	**1**	**1**	**0**

Figure 17.1: Cycling Rates by School Level
2010 (%)



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[16] 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)[17], 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.

[16] Annual average daily traffic

[17] 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%