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Research Report Prepared for
Auckland Transport

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2011 Auckland Region Manual Cycle Monitor

- North Shore Ward -

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1.1 Introduction

The Need For Reliable Cycle Trip Data

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

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

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

Manual Cycle Monitoring

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

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

[1] Auckland Regional Transport Authority (2006) *Regional Cycle Monitoring Plan (Provisional Guidelines)*
[2] For example, Manukau and North Shore cities' monitors took place at the same morning and evening peak times, while Auckland city's differs by one hour for the evening peak, and Waitakere's differs for both peaks.

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

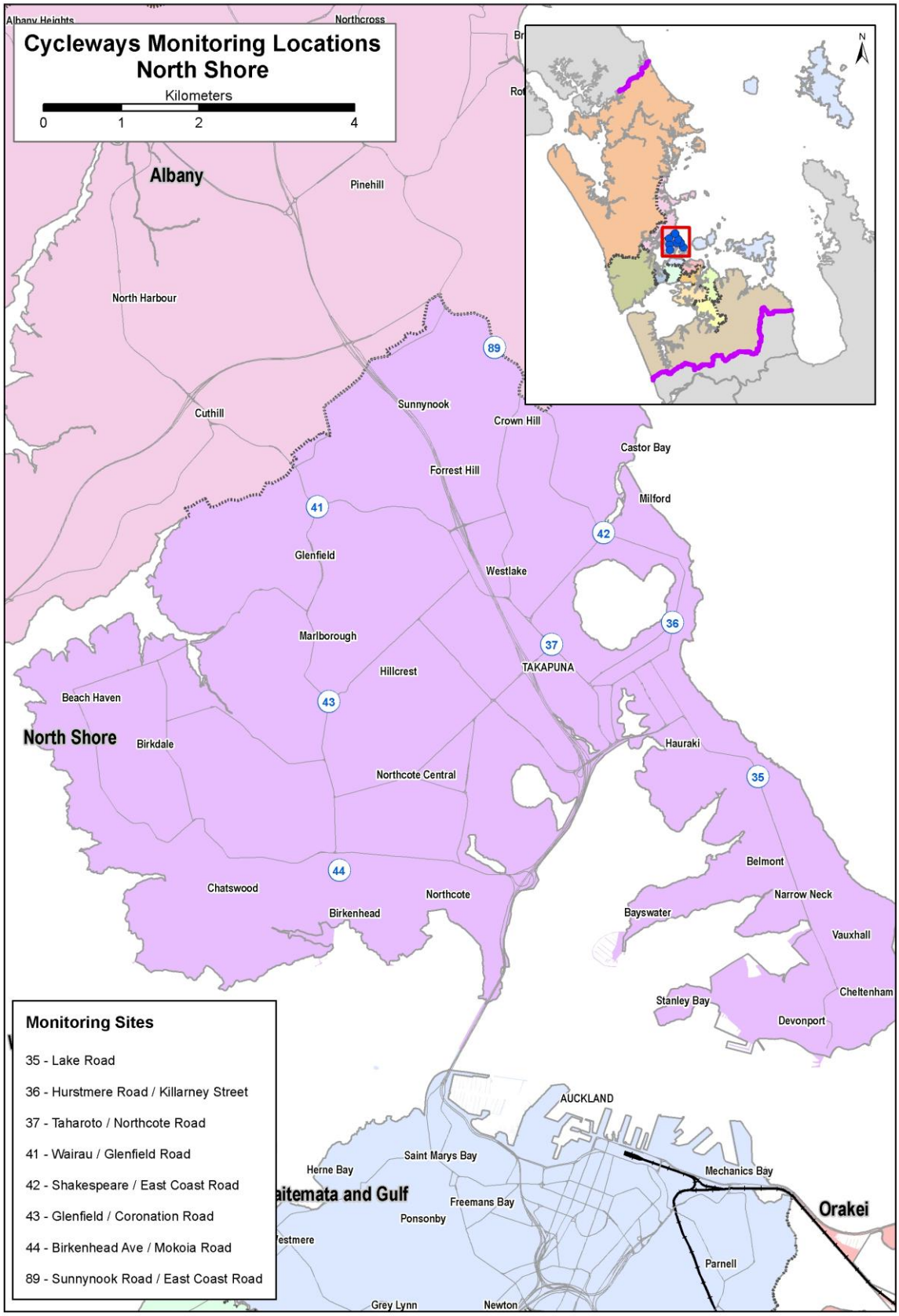
- standard monitoring days are used – that is, school and tertiary holidays, and statutory holidays are excluded and that monitoring preferably takes place at the same time each year to enable reliable year-on-year comparisons to be made. Decisions about whether cycle counts take place on weekdays and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

This report presents results from manual cycle counts conducted at 8 sites in the North Shore ward following a standardised methodology. Results are presented site-by-site, as well as being aggregated to a ward and region level. For sites also monitored in 2007, 2008, 2009 and/or 2010, comparative results are provided.

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

Figure 1.1 shows the locations of the monitoring sites in the North Shore ward. Note that one site (Sunnynook/East Coast Road in Sunnynook – Site 89) lies on the border with the Albany ward. Consequently results for this site have been included in both ward reports.

Figure 1.1: 2011 Cycle Monitoring Locations in North Shore Ward



1.2 Methodology

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

Choice of Sites

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

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

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

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

Monitoring Times

Time Of Day

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

Day Of Week

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

Time Of Year

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

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

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

Counts were conducted on the following days:

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

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

Weather and Daylight Conditions

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

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

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

Tuesday 8th March

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

Wednesday 9th March

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

Thursday 10th March

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

Conducting The Manual Counts

Scoping Visit

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

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

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

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

Briefing Session

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

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

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

Conducting The Manual Counts

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

During their shift the surveyor collected data on:

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

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

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

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

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

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

Data Analysis

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

Annual Average Daily Traffic (AADT) Analysis

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

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

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

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

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

School Bike Shed Counts

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

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

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

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

Methodology

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

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

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

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

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

Reporting

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

Manual Counts - Site Level Reporting

The following results have been reported for each site:

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

Manual Counts - Aggregated Reporting

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

Bike Shed Counts

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

1.3 Summary of Results

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

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

Note: Surveying in the North Shore ward was undertaken on Wednesday 9th of March, 2011. Sunrise was at 7:13am and sunset at 7:50pm. The highest temperature was 22.5 degrees Celsius.

1.4 Morning Peak

Environmental Conditions

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

Key Points

- A total of 965 cyclist movements were recorded across the eight sites in the morning peak period (between 6:30am and 9:00am) in 2011 – including 21 per cent (n=198) observed cycling as groups (this share up from 15 per cent of cycle movements last year).
- Of the sites monitored in both 2010 and 2011, the number of morning cycle movements observed has increased – up from 733 to 884. This represents a 21 per cent increase in cycle movements over the last 12 months.
- The average volume of morning cyclists across the eight sites monitored in the North Shore ward is 121 cycle movements.
- The busiest site in the morning peak is at Lake Road by Takapuna Grammar (220, up from 186 cycle movements in 2010), whereas Birkenhead Avenue/Mokoia Road has the lowest level of morning cyclist traffic (22 cycle movements).
- Five of the seven sites monitored since 2007 recorded increases this year compared to 2010. The most notable increase is at Taharoto/Northcote Road, up 73 per cent from last year.
- The remaining two sites (of those monitored since 2007) recorded declines:
  - Glenfield/Coronation Road – down 27 per cent; and
  - Birkenhead Ave/Mokoia Road – down 24 per cent.

Table 1.1: Summary Of Morning Cyclist Movements

2007-2011 (n)

Site Number	*Locations*	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11	Change 07-11
35	Lake Road, by Takapuna Grammar	127	200	166	186	**220**	18%	73%
37	Taharoto/Northcote Road	111	160	98	117	**202**	73%	82%
36	Hurstmere Road/Killarney Street	76	134	186	180	**191**	6%	151%
42	Shakespeare/East Coast Road	82	127	177	146	**181**	24%	121%
41	Wairau/Glenfield Road	34	39	42	38	**41**	8%	21%
43	Glenfield/Coronation Road	16	36	36	37	**27**	-27%	69%
44	Birkenhead Ave/Mokoia Road	20	20	27	29	**22**	-24%	10%
	Average per site (7 sites since 2007)	**67**	**102**	**105**	**105**	**126**	**21%**	**90%**
	Total (7 sites since 2007)	**466**	**716**	**732**	**733**	**884**	**21%**	**90%**
89	Sunnynook Road/East Coast Road	-	-	-	-	**81**	**-**	-
	Average per site (8 sites in 2011)	**-**	-	**-**	**-**	**121**	**-**	**-**
	Total (8 sites in 2011)	**-**	**-**	**-**	**-**	**965**	**-**	**-**

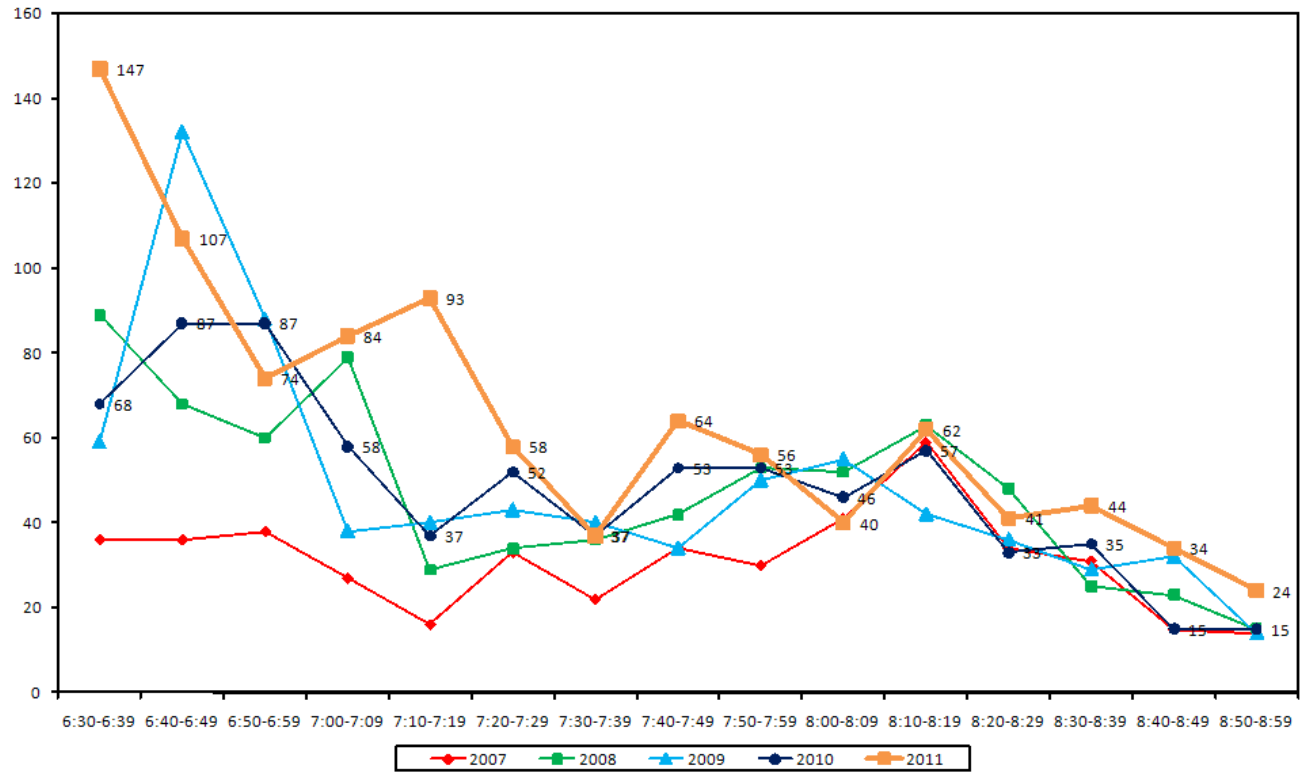
- Morning cyclist characteristics are shown in Table 1.2 below. Overall, 85 per cent of cyclists are adults, compared with 83 per cent in 2010.
- Almost all morning cyclists (99 per cent) are wearing a helmet across all North Shore ward sites (stable from 98 per cent last year).
- The greatest share of morning cyclists in the North Shore ward are male (65 per cent)
- On average, 80 per cent of cyclists are riding on the road (stable from 81 per cent in 2010). Footpath riding is most evident at the Taharoto/Northcote Road intersection (33 per cent).

Table 1.2: Summary of Morning Cyclist Characteristics
2007-2011 (%)

	2007	***2008***	***2009***	***2010***	***2011***	**Change 10-11**
Cyclist Type						
Adult	73	79	85	83	85	2
School child	27	21	15	17	15	-2
Helmet Wearing						
Helmet on head	94	98	97	98	99	1
No helmet	6	2	3	2	1	-1
Gender						
Male	-	-	-	-	65	-
Female	-	-	-	-	16	-
Can't tell	-	-	-	-	19	-
Where Riding						
Road	71	80	81	81	80	-1
Footpath	29	20	19	19	17	-2
Off-road cycleway	0	0	0	0	3	3
Base:	***466***	***716***	***732***	***733***	***965***	

- Figure 1.2 illustrates the total number of cyclists in the morning peak by time of movement. The volume of morning cycle movements starts off with a notable peak (147 movements between 6:30am to 6:39am). Cycle volumes then decrease throughout the monitoring period. This result is similar to that recorded last year, with the exception that cycle volumes were much lower at the beginning of the morning peak period in 2010 (68 movements between 6:30am and 6:39am compared with 147 this year).

Figure 1.2: Total Cyclist Frequency – Morning Peak
2007-2011 (n)



1.5 Evening Peak

Environmental Conditions

- All North Shore sites generally experienced fine weather in the evening monitoring period. Periods of light drizzle were observed at various times at some sites.
- There were no road works or accidents that may affect cycle counts

Key Points

- A total of 612 cyclist movements were recorded across the eight sites in the evening peak period (between 4:00pm and 7:00pm) in 2011 – including one per cent (n=3) observed cycling as groups (this compares with 3 per cent last year).
- Across the seven sites monitoring in both 2010 and 2011, the number of cycle movements has declined – down from 689 in 2010 to 519 this year, a 25 per cent decrease over the last 12 months.
- The average volume of evening cyclists across the eight sites monitored in the North Shore ward is 77 cycle movements.
- Of the eight sites monitored in the North Shore ward, the intersection at the Hurstmere Road/Killarney Street site is the busiest in terms of the evening cyclists' activity, with 113 cycle movements recorded (down from 122 movements last year). Shakespeare/East Coast Road and Taharoto/Northcote Road (105 movements each site) are also busy sites in this ward.
- The lowest level of evening cyclist traffic is at the Birkenhead Avenue/Mokoia Road intersection (23 movements).
- All sites recorded decreases this year compared to 2010. The most notable decreases are at:
  - Glenfield/Coronation Road – down 55 per cent; and
  - Birkenhead Avenue/Mokoia Road – down 50 per cent.

Table 1.3: Summary Of Evening Cyclist Movements

2007-2011 (n)

Site No.	*Locations*	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11	Change 07-11
36	Hurstmere Road/Killarney Street	45	118	132	122	**113**	-7%	151%
42	Shakespeare/East Coast Road	55	123	133	159	**105**	-34%	91%
37	Taharoto/Northcote Road	51	110	104	112	**105**	-6%	106%
35	Lake Road, by Takapuna Grammar	65	97	129	141	**96**	-32%	48%
41	Wairau/Glenfield Road	30	34	38	53	**52**	-2%	73%
43	Glenfield/Coronation Road	12	39	42	56	**25**	-55%	108%
44	Birkenhead Ave/Mokoia Road	20	29	30	46	**23**	-50%	15%
	Average per site (7 sites since 2007)	**40**	**79**	**87**	**98**	**74**	**-25%**	**87%**
	Total (7 sites since 2007)	**278**	**550**	**608**	**689**	**519**	**-25%**	**87%**
89	Sunnynook Road/East Coast Road	-	-	-	-	**93**	**-**	-
	Average per site (8 sites in 2011)	**-**	-	**-**	**-**	**77**	**-**	**-**
	Total (8 sites in 2011)	**-**	**-**	**-**	**-**	**612**	**-**	**-**

- The majority of evening cyclists are adults (85 per cent, up slightly from 82 per cent in 2010). Of the eight sites, the Shakespeare/East Coast Road intersection has the smallest share of adult cyclists in the evening (80 per cent).
- Ninety-two per cent of evening cyclists are wearing a helmet (stable from 93 per cent last year). A higher proportion of evening cyclists at the Lake Road intersection are not wearing a helmet compared with other sites (16 per cent).
- The greatest share of evening cyclists are male (85 per cent).
- Three-quarters of cyclists are riding on the road in the evening (76 per cent, up slightly from 72 per cent in 2010).

Table 1.4: Summary of Evening Cyclist Characteristics

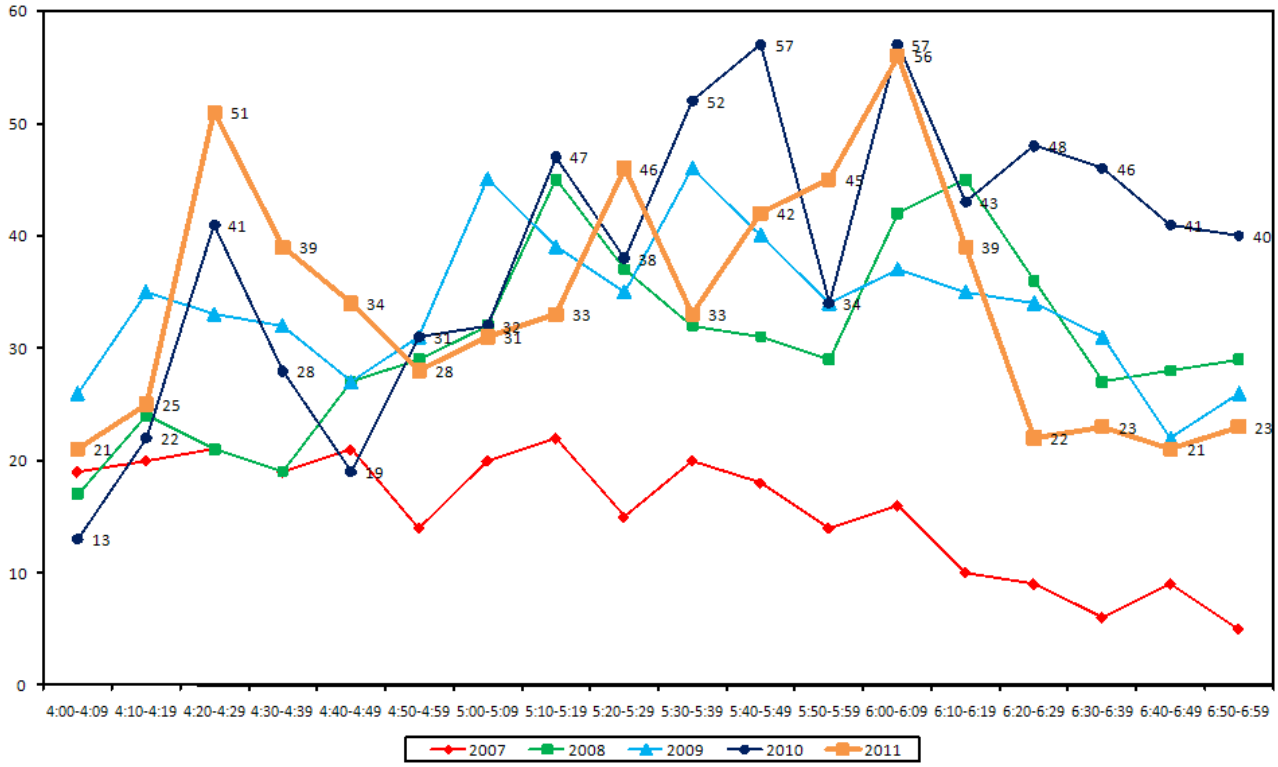
2007-2011 (%)

	2007	***2008***	***2009***	***2010***	***2011***	**Change 09-10**
Cyclist Type						
Adult	90	85	87	82	85	3
School child	10	15	13	18	15	-3
Helmet Wearing						
Helmet on head	87	94	94	93	92	-1
No helmet	13	6	6	7	8	1
Gender						
Male	-	-	-	-	85	-
Female	-	-	-	-	11	-
Can't tell	-	-	-	-	4	-
Where Riding						
Road	81	77	78	72	76	4
Footpath	19	23	22	28	18	-10
Off-road cycleway	0	0	0	0	6	6
Base:	***278***	***550***	***608***	***689***	***612***	

- The overall pattern of cyclist volumes by time of movement in the evening is illustrated in Figure 1.3. Evening cyclist volumes peaked twice – first between 4:20pm and 4:29pm (51 movements) and later between 6:00pm and 6:09pm (56 movements). This compares with two peaks in 2010: between 5:40pm and 5:49pm and between 6:00pm and 6:09pm (57 movements for each ten minute interval).

Figure 1.3: Total Cyclist Frequency – Evening Peak

2007-2011 (n)



1.6 Aggregated Total

- A total of 1,577 cyclist movements were recorded across the eight sites in 2011. Thirteen per cent (n=201) of the total cycle movements were observed cycling as groups (compared with 9 per cent in 2010).
- Of the seven sites monitoring in both 2010 and 2011, the total number of cycle movements has declined slightly – from 1,422 to 1,403. This represents a 1 per cent decrease over the last 12 months.
- Consistent with 2010, the busiest site is at Lake Road, by Takapuna Grammar, with a total of 316 movements recorded, while the Birkenhead Ave/Mokoia Road intersection continues to have the fewest cyclists (45 movements).
- Cyclist volumes have increased for three of the seven sites monitored since 2007, with the most notable increase at the intersection of Taharoto/Northcote Road (up 34 per cent from 229 movements in 2010 to 307 movements this year).

Table 1.5: Summary Of Total Cyclist Movements

2007-2011 (n)

Site Number	***Locations***	***2007***	***2008***	***2009***	***2010***	***2011***	**Change 10-11**	**Change 07-11**
35	Lake Road, by Takapuna Grammar	192	297	295	327	**316**	-3%	65%
42	Shakespeare/East Coast Road	137	250	310	305	**286**	-6%	109%
36	Hurstmere Road/Killarney Street	121	252	318	302	**304**	1%	151%
37	Taharoto/Northcote Road	162	270	202	229	**307**	34%	90%
41	Wairau/Glenfield Road	64	73	80	91	**93**	2%	45%
43	Glenfield/Coronation Road	28	75	78	93	**52**	-44%	86%
44	Birkenhead Ave/Mokoia Road	40	49	57	75	**45**	-40%	13%
	Average per site (7 sites since 2007)	**106**	**181**	**191**	**203**	**200**	**-1%**	**89%**
	Total (7 sites since 2007)	**744**	**1266**	**1340**	**1422**	**1403**	**-1%**	**89%**
89	Sunnynook Road/East Coast Road	-	-	-	-	**174**	-	-
	Average per site (8 sites in 2011)	**-**	-	**-**	**-**	**197**	**-**	**-**
	Total (8 sites in 2011)	**-**	**-**	**-**	**-**	**1577**	**-**	**-**

- Overall cyclist characteristics are illustrated in Table 1.6. In total, 85 per cent of cyclists are adults, up slightly from 82 per cent in 2010.
- Almost all cyclists are wearing a helmet (96 per cent, stable from last year).
- The greatest share of North Shore cyclists are male (73 per cent).
- On average, just more than three-quarters of cyclists are riding on the road (79 per cent, up slightly from 76 per cent in 2010).

Table 1.6: Summary of Total Cyclist Characteristics

2007-2010 (%)

	2007	*2008*	*2009*	*2010*	*2011*	Change 10-11
Cyclist Type						
Adult	79	82	86	82	85	3
School child	21	18	14	18	15	-3
Helmet Wearing						
Helmet on head	91	97	96	96	96	0
No helmet	9	3	4	4	4	0
Gender						
Male	-	-	-	-	73	-
Female	-	-	-	-	14	-
Can't tell	-	-	-	-	13	-
Where Riding						
Road	75	79	80	76	79	3
Footpath	25	21	20	24	17	-7
Off-road cycleway	0	0	0	0	4	4
Base:	***744***	***1266***	***1340***	***1422***	***1577***	

1.7 Average Annual Daily Traffic (AADT) Estimate

AADT Estimate

- Table 1.7 provides the comparative AADT estimates for each site, based on the average of morning and evening peak AADT calculations.
- The highest AADT is at the Lake Road site (469 daily movements, compared with 479 movements in 2010) and the lowest is at Birkenhead Ave/Mokoia Road (65 daily movements, down from 108 movements last year).
- Of the seven sites monitored since 2007, three have recorded increases in total AADT estimates this year compared with 2010, with the most notable increase at the Taharoto/Northcote Road intersection (up 36 per cent).
- In contrast, the number of total cyclists recorded at four sites is lower than last year. The most notable decreases are at:
  - Glenfield/Coronation Road – down 43 per cent; and
  - Birkenhead Ave/Mokoia Road – down 40 per cent.

Table 1.7: AADT Estimates Based on Morning and Evening Cyclist Movements 2007-2011 (n)

Site Number	*Locations*	*2007*[9]	*2008*	*2009*	*2010*	*2011*	Change 10-11	Change 07-11
35	Lake Road, by Takapuna Grammar	444	440	432	479	**469**	-2%	6%
37	Taharoto/Northcote Road	375	396	293	333	**454**	36%	21%
36	Hurstmere Road/Killarney Street	279	368	466	443	**448**	1%	61%
42	Shakespeare/East Coast Road	314	364	454	442	**422**	-5%	34%
89	Sunnynook Road/East Coast Road	-	-	-	-	**252**	-	-
41	Wairau/Glenfield Road	93	107	117	131	**134**	2%	44%
43	Glenfield/Coronation Road	64	109	113	134	**76**	-43%	19%
44	Birkenhead Ave/Mokoia Road	58	71	83	108	**65**	-40%	12%

[9] As in 2008 and 2009, the AADT estimates for North Shore city this year are calculated under "dry" weather factor, whereas a "wet" factor was applied to AADT calculations in 2007.

1.8 North Shore Ferry Wharves

Key Points

- In the morning, 5 cycles were observed at the Devonport Ferry Terminal at 6.10am, with 47 recorded at 9.10am. In the afternoon, 79 cycles were recorded at the Devonport Ferry Terminal at 3.30pm (Note: This includes cycles from a cycle tour) and 11 were observed at 7.10pm.
- After the morning peak, 5 cycles were observed parked at the Bayswater ferry wharf. No cycles were observed at either Northcote or Birkenhead wharves.

1.9 School Bike Shed Count Summary

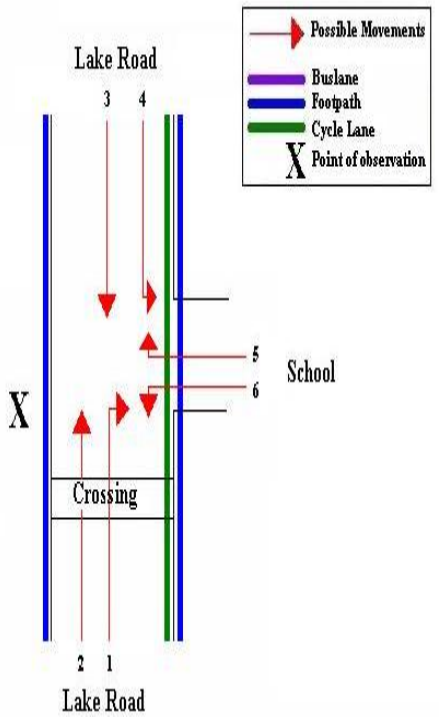
Key Points

- Among the surveyed schools, of those eligible to cycle, on average, four per cent of students are cycling to their schools.
- Among the 13 participating schools, n=477 students were reported as cycling to school.
- As in previous years, Belmont Intermediate School reported the highest share of cyclists – 30 per cent of all eligible students currently cycling (down from 33 per cent last year).
- Of the 13 schools that responded, one had no students cycling to school.
- Rates of cycling to school are highest among intermediate schools (10 per cent, up from 9 per cent in 2010) and lowest for full primary schools (no cyclists).

2. LAKE ROAD, TAKAPUNA (SITE 35)

Figure 2.1 shows the possible cyclist movements at this site.

Figure 2.1: Cycle Movements: Lake Road



2.1 Site Summary

	Raw Counts			AADT
	Morning Peak	*Evening Peak*	*Total*	*Total*
2007	127	65	192	444
2008	200	97	297	440
2009	166	129	295	432
2010	186	141	327	479
2011	**220**	**96**	**316**	**469**

2.2 Morning Peak

Environmental Conditions

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

Key Points

- Morning cyclist movements have increased at the Lake Road site to 220 movements (up from 186 movements in 2010).
- Key morning movements are straight along Lake Road in both directions (Movement 3 = 122 movements; Movement 2 = 89 movements).
- Movement 2 (up 38 movements) saw the greatest change in cyclist movements.

Table 2.1: Morning Cyclist Movements

Lake Road 2007-2011 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11
1	1	0	3	1	2	**1**
2	40	68	50	51	89	**38**
3	85	132	110	131	122	**-9**
4	1	0	3	3	6	**3**
5	0	0	0	0	0	**0**
6	0	0	0	0	0	**0**
Total	**127**	**200**	**166**	**186**	**220**	**34**

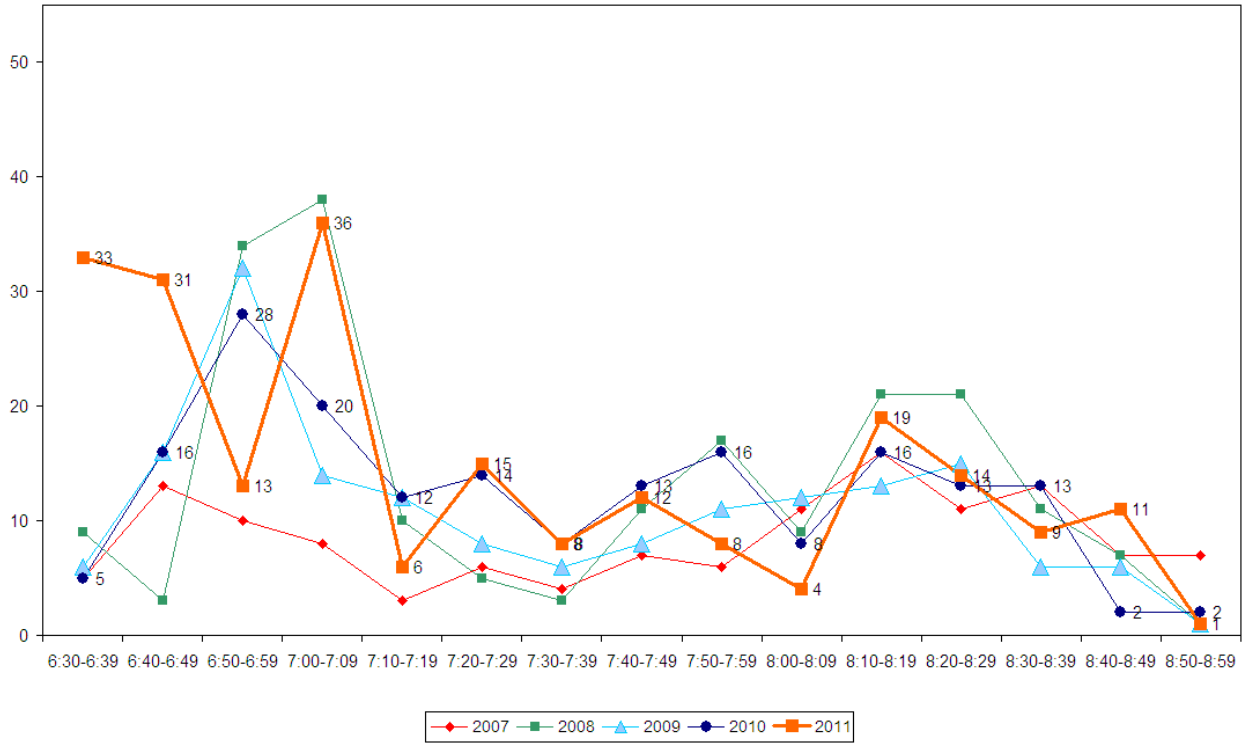
- Over the morning peak in 2011, adults comprise the greatest share of cycle movements (80 per cent, stable from 81 per cent in 2010).
- The majority of cyclists are wearing a helmet (98 per cent, stable from 97 per cent in 2010).
- Just over half the cyclists were identified as male (58 per cent).
- Most cyclists were riding on the rode (83 per cent, stable from 84 per cent in 2010).

Table 2.2: Morning Cyclist Characteristics
Lake Road 2007-2011 (%)

	2007	***2008***	***2009***	***2010***	***2011***	**Change 10-11**
Cyclist Type						
Adult	65	77	83	81	80	**-1**
School child	36	23	17	19	20	**1**
Helmet Wearing						
Helmet on head	98	98	98	97	98	**1**
No helmet	2	2	2	3	2	**-1**
Gender						
Male	-	-	-	-	58	**-**
Female	-	-	-	-	16	**-**
Can't tell	-	-	-	-	26	**-**
Where Riding						
Road	77	78	77	84	83	**-1**
Footpath	23	22	23	16	17	**1**
Base:	***127***	***200***	***166***	***186***	***220***	

- The volume of morning cycle movements varies throughout the monitoring period, starting high with 33 movements (6:30am and 6:39am) and 31 movements (6:40am and 6:49am) before decreasing and then reaching the highest peak of the morning between 7:00am and 7:09am (36 movements).

Figure 2.2: Morning Peak Cyclist Frequency
Lake Road (n)



Note: In 2011, 32 per cent of the total cycle movements in the morning peak were identified as cycling in groups. Three or more cyclists were observed travelling in groups at this site at the following times:

- *Fifteen cyclists at 6:30am*
- *Five cyclists at 6:39am*
- *Four cyclists at 6:47am*
- *Nine cyclists at 6:48am*
- *Ten cyclists at 6:49am*
- *Seven cyclists at 6:57am*
- *Twenty-one cyclists at 7:06am*

2.3 Evening Peak

Environmental Conditions

- The weather was overcast but fine throughout the evening shift, with the exception of light drizzle between 4:02pm and 4:20pm.
- There were no road works or accidents that may affect cycle counts.

Key Points

- In 2011, the volume of evening cyclist movements notably decreased, from 141 movements in 2010 down to 96 movements.
- Consistent with last year, the most common movements in the evening are straight along Lake Road in both directions (Movement 2 = 54 cyclists; Movement 3 = 32 cyclists).
- The most notable differences in evening cyclist volumes between this year and last occurred at Movement 2 (down 38 movements) and Movement 3 (down 12 movements).

Table 2.3: Evening Cyclist Movements

Lake Road 2007-2011 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11
1	0	0	2	0	0	**0**
2	27	38	64	92	54	**-38**
3	34	56	53	44	32	**-12**
4	1	3	2	3	3	**0**
5	2	0	5	1	4	**3**
6	1	0	3	1	3	**2**
Total	**65**	**97**	**129**	**141**	**96**	**-45**

- The majority of cyclists using this site in the evening are adults (82 per cent, down slightly from 85 per cent in 2010).
- Although fewer cyclists wore helmets this year than in 2010, the majority still wore a helmet (84 per cent, down from 91 per cent last year).
- Nine in ten cyclists were identified as male (90 per cent).
- Nearly three quarters of cyclists (71 per cent) were riding on the road (down slightly from 76 per cent last year).

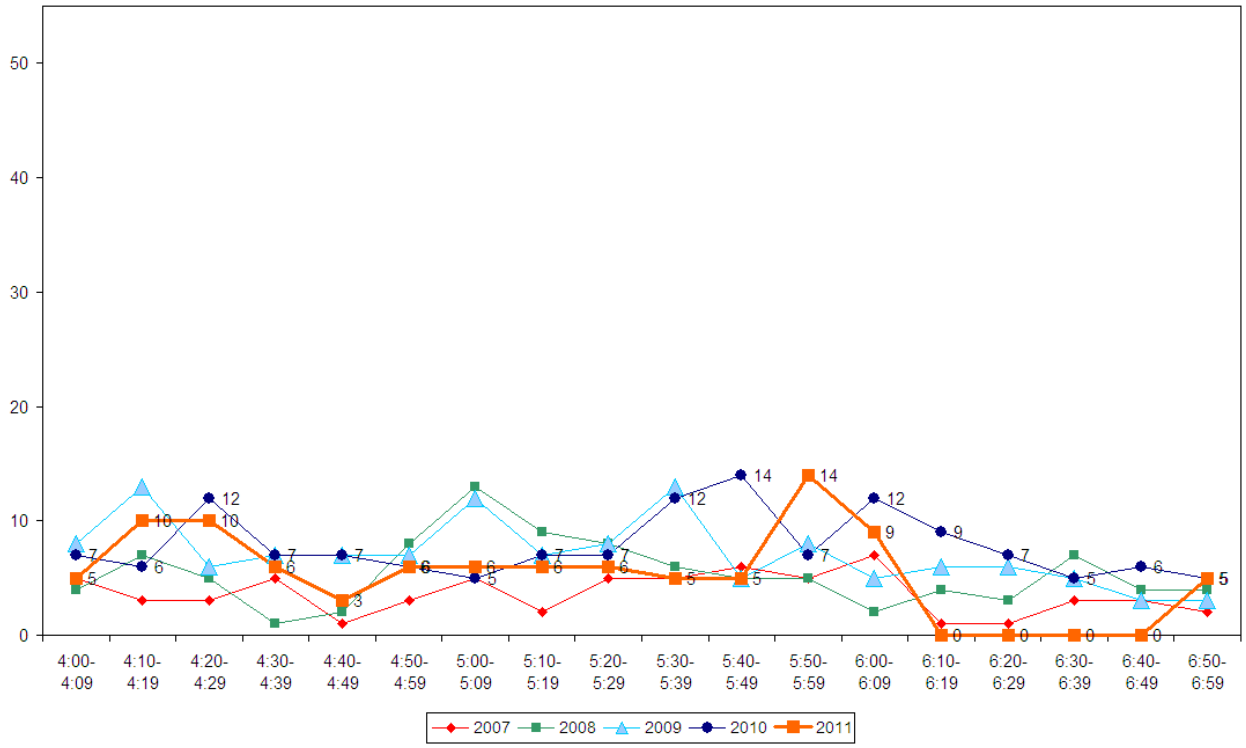
Table 2.4: Evening Cyclist Characteristics

Lake Road 2007-2011 (%)

	2007	*2008*	*2009*	*2010*	*2011*	Change 10-11
Cyclist Type						
Adult	97	85	85	85	82	**-3**
School child	3	15	15	15	18	**3**
Helmet Wearing						
Helmet on head	94	92	94	91	84	**-7**
No helmet	6	8	6	9	16	**7**
Gender						
Male	-	-	-	-	90	**-**
Female	-	-	-	-	9	**-**
Can't tell	-	-	-	-	1	**-**
Where Riding						
Road	95	76	74	76	71	**-5**
Footpath	5	24	26	24	29	**5**
Base:	***65***	***97***	***129***	***141***	***96***	

- The volume of cycle movements varies during the evening shift, with two notable peaks between 4:10pm and 4:29pm (10 movements per each ten minute interval) and the greatest peak between 5:50pm and 5:59pm (14 movements).

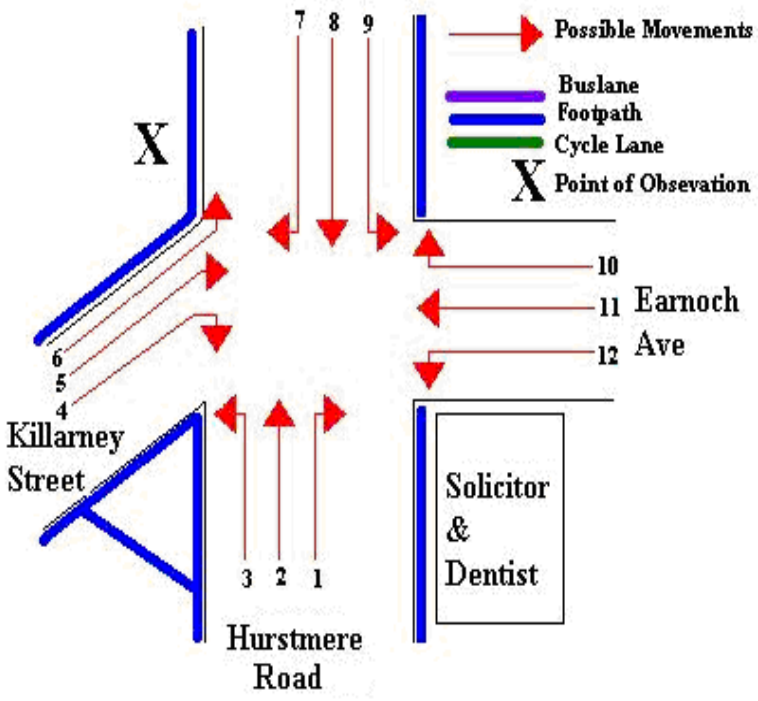
Figure 2.3: Evening Peak Cyclist Frequency
Lake Road (n)



3. HURSTMERE ROAD/KILLARNEY STREET, TAKAPUNA (SITE 36)

Figure 3.1 shows the possible cyclist movements at this intersection.

Figure 3.1: Cycle Movements: Hurstmere Road/Killarney Street



3.1 Site Summary

	Raw Counts			*AADT*
	Morning Peak	*Evening Peak*	*Total*	*Total*
2007	76	45	121	279
2008	134	118	252	368
2009	186	132	318	466
2010	180	122	302	443
2011	**191**	**113**	**304**	**448**

3.2 Morning Peak

Environmental Conditions

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

Key Points

- The volume of morning cyclist movements at the Hurstmere Road/Killarney Street intersection is up from 180 movements in 2010 to 191 movements in 2011.
- The key movements in the morning are straight along Hurstmere Road heading in either direction (Movement 2 = 43 movements and Movement 8 = 76 movements) and turning left from Killarney Street onto Hurstmere Road heading north (Movement 6 = 62 movements).
- The most notable changes in cycle movements occurred at Movement 6 (up 20 movements), Movement 8 (down 15 movements), and Movement 2 (up 10 movements).

Table 3.1: Morning Cyclist Movements

Hurstmere Road/Killarney Street 2007-2011 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11
1	0	0	2	0	0	**0**
2	15	43	44	33	43	**10**
3	0	1	1	5	1	**-4**
4	0	3	0	1	0	**-1**
5	0	0	0	0	0	**0**
6	9	46	15	42	62	**20**
7	6	6	6	7	6	**-1**
8	44	33	117	91	76	**-15**
9	2	1	0	1	0	**-1**
10	0	1	0	0	3	**3**
11	0	0	0	0	0	**0**
12	0	0	1	0	0	**0**
Total	**76**	**134**	**186**	**180**	**191**	**11**

- Over the morning peak, most cyclists using this intersection were adults (95 per cent, up slightly from 92 per cent in 2010).
- All cyclists were wearing a helmet (100 per cent, stable from 99 per cent last year).
- Four fifths of cyclists are male (80 per cent).
- Most cyclists are riding on the road (94 per cent, up slightly from 90 per cent last year).

Table 3.2: Morning Cyclist Characteristics

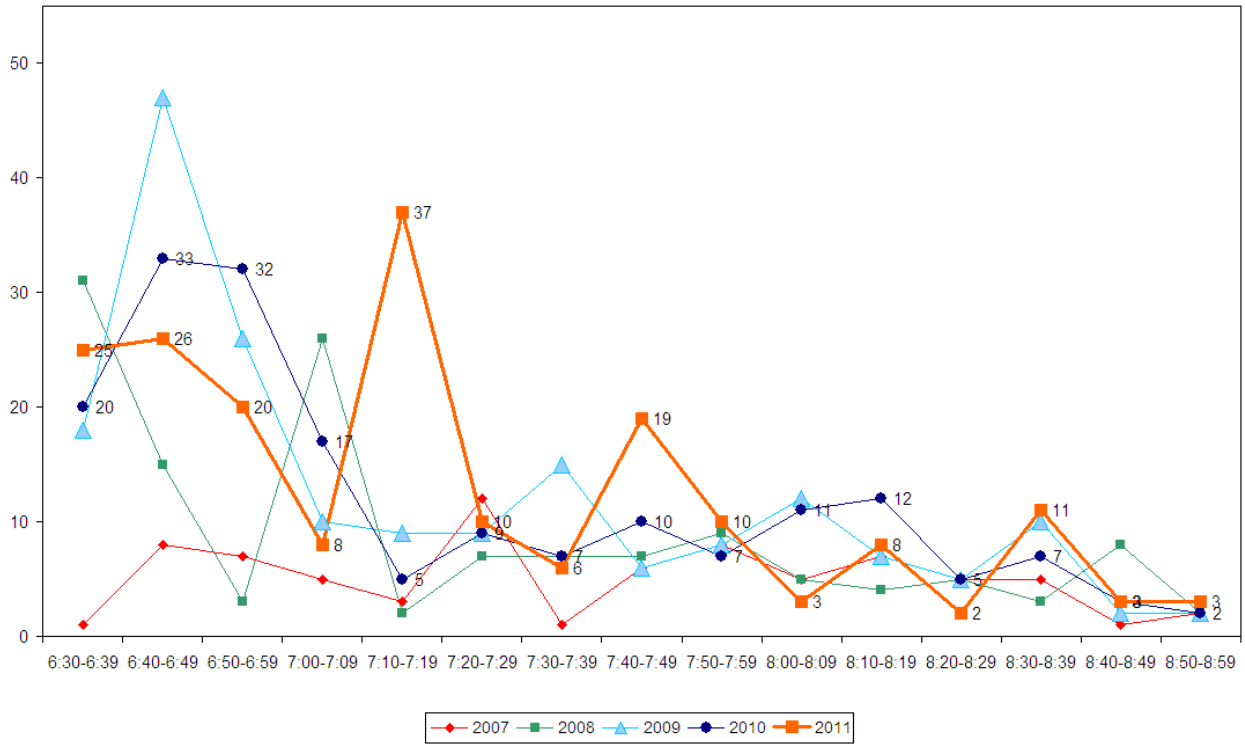
Hurstmere Road/Killarney Street 2007-2011 (%)

	2007	*2008*	*2009*	*2010*	*2011*	Change 10-11
Cyclist Type						
Adult	87	75	94	92	95	**3**
School child	13	25	6	8	5	**-3**
Helmet Wearing						
Helmet on head	93	99	98	99	100	**1**
No helmet	7	1	2	1	0	**-1**
Gender						
Male	-	-	-	-	80	**-**
Female	-	-	-	-	20	**-**
Can't tell	-	-	-	-	0	**-**
Where Riding						
Road	83	93	90	90	94	**4**
Footpath	17	7	10	10	6	**-4**
Base:	***76***	***134***	***186***	***180***	***191***	

- The volume of morning cycle movements varies throughout the shift, starting high and reaching the greatest peak between 7:10am an 7:19am (37 movements, Note: This includes a group of 8 cyclists and two groups of 6 cyclists). Another peak occurs between 7:40am and 7:49am, with the final peak between 8:30 and 8:39am (11 movements).

Figure 3.2: Morning Peak Cyclist Frequency

Hurstmere Road/Killarney Street (n)



Note: In 2011, 26 per cent of the total cycle movements in the morning peak were identified as cycling in groups. Three or more cyclists were observed travelling in groups at this site at the following times:

- *Nine cyclists at 6:26am*
- *Eight cyclists at 6:41am*
- *Six cyclists at 6:59 am*
- *Eight cyclists at 7:11am*
- *Six cyclists at 7:17am*
- *Six cyclists at 7:19am*
- *Six cyclists at 7:47am*

3.3 Evening Peak

Environmental Conditions

- The weather was overcast but fine throughout the evening shift, with the exception of light drizzle between 4:02pm and 4:20pm.
- There were no road works or accidents that may affect cycle counts.

Key Points

- The volume of evening cyclist movements at the Hurstmere Road/Killarney Street intersection is down slightly from 122 movements in 2010 to 113 movements in 2011.
- The key movements in the morning are straight along Hurstmere Road heading either direction (Movement 2 = 62 movements and Movement 8 = 18 movements) and turning left from Killarney Street onto Hurstmere street heading north (Movement 6 = 24 movements).
- Movements 6 and 8 saw the greatest change in volume from 2010 (both down 7 movements).

Table 3.3: Evening Cyclist Movements

Hurstmere Road/Killarney Street 2007-2011 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11
1	0	0	0	0	0	**0**
2	24	42	81	53	62	**9**
3	0	0	2	1	0	**-1**
4	0	0	0	1	3	**2**
5	0	1	0	0	0	**0**
6	7	48	27	31	24	**-7**
7	2	5	3	6	6	**0**
8	10	20	19	25	18	**-7**
9	2	0	0	0	0	**0**
10	0	2	0	5	0	**-5**
11	0	0	0	0	0	**0**
12	0	0	0	0	0	**0**
Total	**45**	**118**	**132**	**122**	**113**	**-9**

- Over the evening peak, the greatest share of cyclists using the Hurstmere Road/Killarney Street intersection were adults (88 per cent, notably up from 78 per cent in 2010).
- Most cyclists are wearing a helmet (93 per cent, unchanged from 2010).
- The majority of the cyclists were male (92 per cent).
- The number of cyclists riding on the road increased notably to 88 per cent from 72 per cent last year.

Table 3.4: Evening Cyclist Characteristics

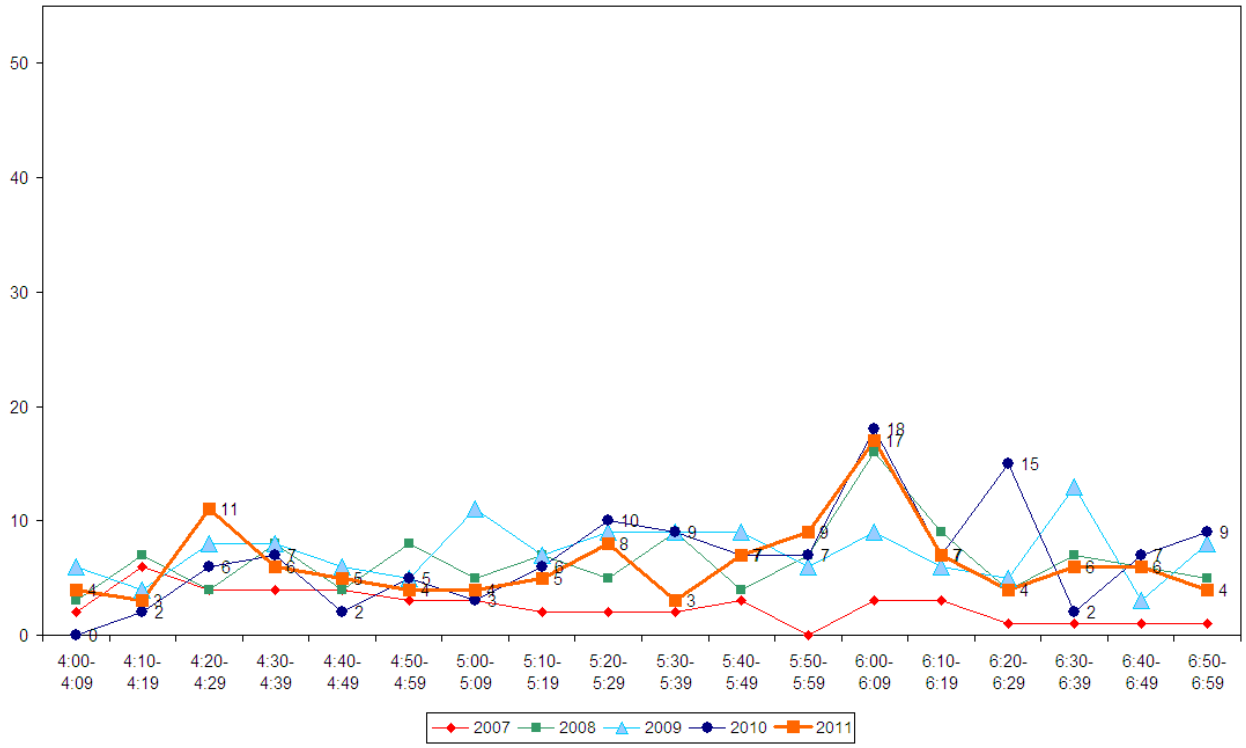
Hurstmere Road/Killarney Street 2007-2011 (%)

	2007	*2008*	*2009*	*2010*	*2011*	Change 10-11
Cyclist Type						
Adult	89	81	92	78	88	**10**
School child	11	19	8	22	12	**-10**
Helmet Wearing						
Helmet on head	89	92	96	93	93	**0**
No helmet	11	8	4	7	7	**0**
Gender						
Male	-	-	-	-	92	**-**
Female	-	-	-	-	8	**-**
Can't tell	-	-	-	-	0	**-**
Where Riding						
Road	82	79	89	72	88	**16**
Footpath	18	21	11	28	12	**-16**
Base:	***45***	***118***	***132***	***122***	***113***	

- The volume of evening cyclist movements stays relatively stable, except for a slight peak between 4:20pm and 4:29pm (11 movements), and the largest peak between 6:00 and 6:09 (17 movements), the same time as the largest peak in 2010 (18 movements).

Figure 3.3: Evening Peak Cyclist Frequency

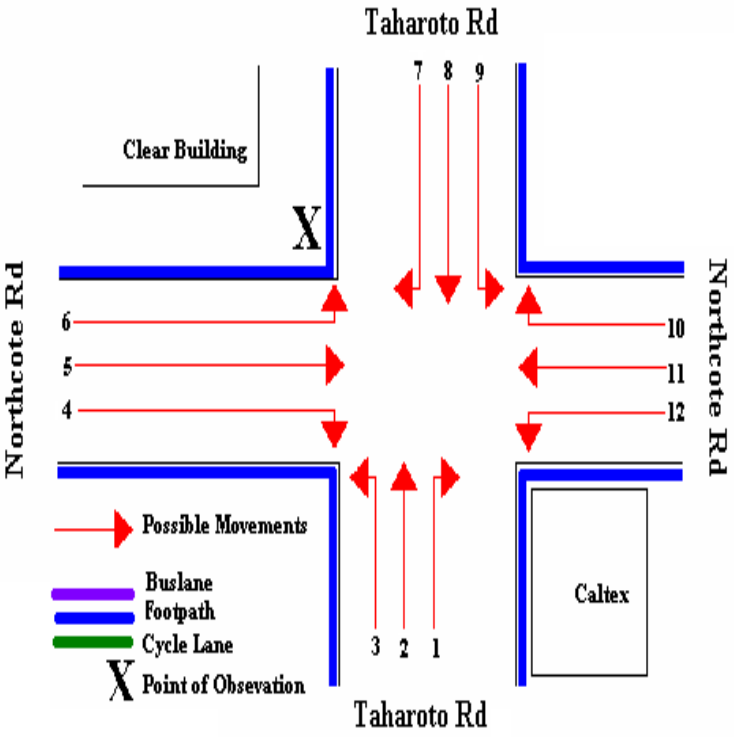
Hurstmere Road/Killarney Street (n)



4. TAHAROTO ROAD/NORTHCOTE ROAD, TAKAPUNA (SITE 37)

Figure 4.1 shows the possible cyclist movements at this intersection.

Figure 4.1: Cycle Movements: Taharoto/Northcote Road



4.1 Site Summary

	Raw Counts			AADT
	Morning Peak	*Evening Peak*	*Total*	*Total*
2007	109	50	159	375
2008	160	110	270	396
2009	98	104	202	293
2010	117	112	229	333
2011	**202**	**105**	**307**	**454**

4.2 Morning Peak

Environmental Conditions

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

Key Points

- Cyclist movement volumes have increased notably this year, from 117 in 2010 to 202 movements.
- The key morning movement is straight along Taharoto Road heading southeast (Movement 8 = 122 cyclists).
- Morning cyclist volumes at most movements increased from 2010, with Movement 8 (up 53 movements) and Movement 2 (11 Movements) seeing the greatest change.

Table 4.1: Morning Cyclist Movements

Taharoto/Northcote Road 2007-2011 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11
1	1	4	4	4	5	**1**
2	9	21	21	17	28	**11**
3	12	3	2	1	5	**4**
4	19	14	14	12	8	**-4**
5	3	2	2	5	1	**-4**
6	3	7	2	0	6	**6**
7	1	3	4	2	5	**3**
8	42	78	44	69	122	**53**
9	0	0	1	0	7	**7**
10	0	0	0	0	1	**1**
11	2	1	1	3	1	**-2**
12	16	27	3	4	13	**9**
Total	**109**	**160**	**98**	**117**	**202**	**84**

- Over the morning peak, adults comprise a little more than three quarters of cyclist movements (77 per cent, up slightly from 72 per cent last year).
- Helmet wearing is widespread (98 per cent, unchanged from 2010).
- Over half of the cyclists could not be identified as male or female (54 per cent), 38 per cent were identified as male, and 7 per cent as female.
- Approximately two-thirds of cyclists are riding on the road (67 per cent, up slightly from 65 per cent last year).

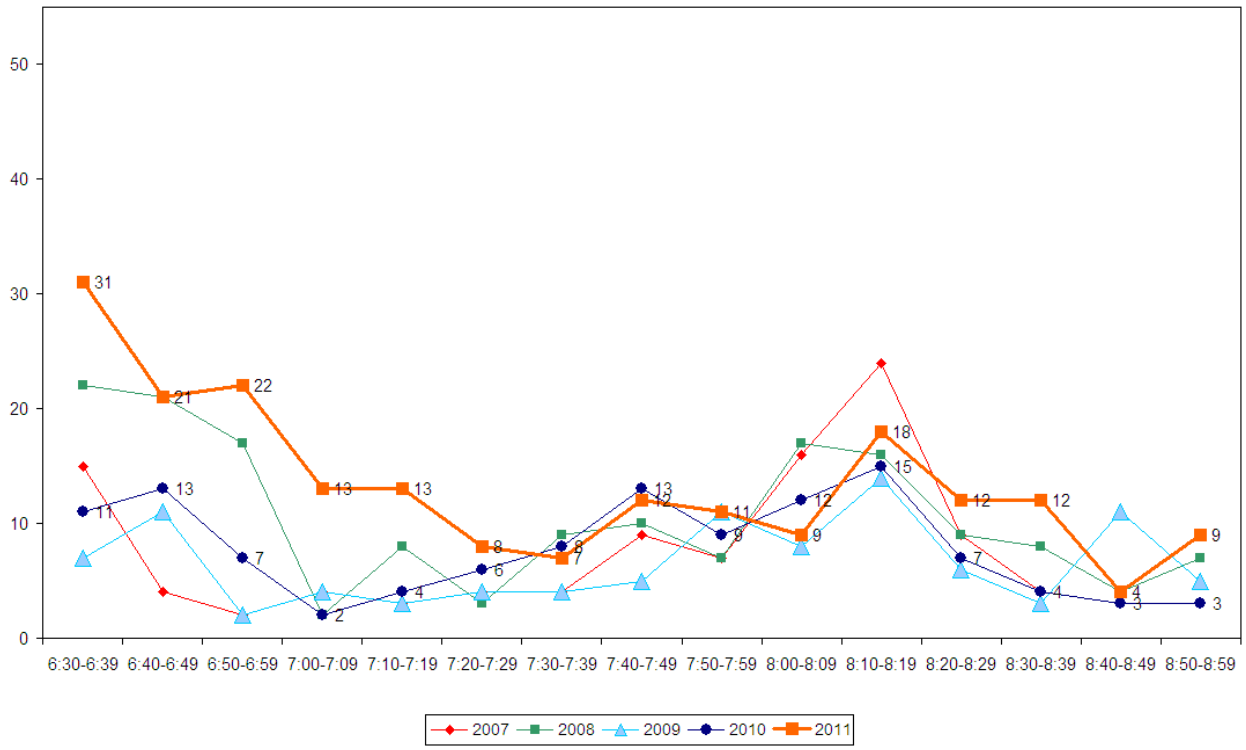
Table 4.2: Morning Cyclist Characteristics
Taharoto/Northcote Road 2007-2011 (%)

	2007	*2008*	*2009*	*2010*	*2011*	Change 10-11
Cyclist Type						
Adult	54	78	72	72	77	**5**
School child	46	22	28	28	23	**-5**
Helmet Wearing						
Helmet on head	94	99	93	98	98	**0**
No helmet	6	1	7	2	2	**0**
Gender						
Male	-	-	-	-	38	**-**
Female	-	-	-	-	7	**-**
Can't tell	-	-	-	-	54	**-**
Where Riding						
Road	47	70	68	65	67	**2**
Footpath	53	30	32	35	33	**-2**
Base:	***109***	***160***	***98***	***117***	***202***	

- Morning cyclist numbers start off notably higher than in 2010 (31 movements compared to 11, remaining higher than previous years but declining until another peak is reached between 8:10am and 8:19am (18 movements). The highest peak in 2010 (15 movements) occurred at the same time as the second peak was observed in 2011.

Figure 4.2: Morning Peak Cyclist Frequency

Taharoto /Northcote Road (n)



Note: In 2011, 14 per cent of the total cycle movements in the morning peak were identified as cycling in groups. Three or more cyclists were observed travelling in groups at this site at the following times:

- *Seven cyclists at 6:39am*
- *Four cyclists at 6:43am*
- *Eight cyclists at 6:49am*
- *Nine cyclists at 6:58am*

4.3 Evening Peak

Environmental Conditions

- The weather was overcast but fine throughout the evening shift, with the exception of light drizzle between 4:02pm and 4:20pm.
- There were no road works or accidents that may affect cycle counts.

Key Points

- The total number of cyclist movements observed at the Taharoto/Northcote Road intersection has decreased slightly from 2010 counts (105 movements down from 112).
- The key evening movement at this site is straight along Taharoto Road in a south-easterly direction (Movement 8 = 45 cyclists) and to a lesser extent, straight along Taharoto Road in a north-westerly direction (Movement 2 = 21).
- More movements saw a decline in volume than an increase, with Movement 8 down by 8 movements and Movement 2 down by 7 movements. Movement 12 saw the greatest increase, up by 7 movements.

Table 4.3: Evening Cyclist Movements

Taharoto/Northcote Road 2007-2011 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11
1	1	4	2	1	1	**0**
2	8	23	20	28	21	**-7**
3	12	13	11	7	11	**4**
4	10	3	6	8	7	**-1**
5	0	2	1	1	0	**1**
6	0	3	6	6	7	**-1**
7	3	3	2	2	0	**-2**
8	11	52	45	53	45	**-8**
9	0	0	0	0	3	**3**
10	0	0	0	1	0	**-1**
11	3	2	5	2	0	**-2**
12	2	5	6	3	10	**7**
Total	**50**	**110**	**104**	**112**	**105**	**-7**

- Over the evening peak, the greatest share of cyclists using this intersection are adults (84 per cent, up slightly from 81 per cent in 2010).
- Almost all cyclists at this site are wearing a helmet (92 per cent, down slightly from 96 per cent in 2010).
- The majority of cyclists were male (67 per cent).
- Nearly three quarters of the cyclists were riding on the road (73 per cent up slightly from 70 per cent in 2010).

Table 4.4: Evening Cyclist Characteristics

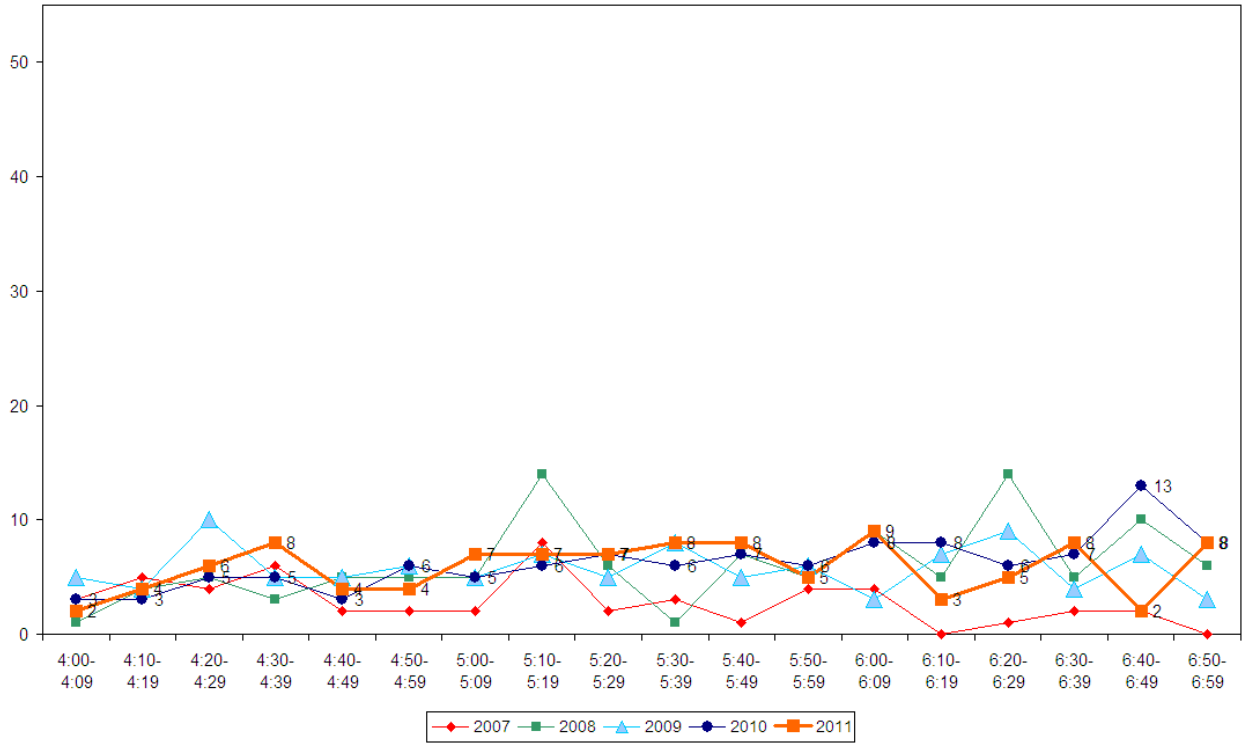
Taharoto/Northcote Road 2007-2011 (%)

	2007	*2008*	*2009*	*2010*	*2011*	Change 10-11
Cyclist Type						
Adult	84	90	92	81	84	**3**
School child	16	10	8	19	16	**-3**
Helmet Wearing						
Helmet on head	82	97	94	96	92	**-4**
No helmet	18	3	6	4	8	**4**
Gender						
Male	-	-	-	-	67	**-**
Female	-	-	-	-	10	**-**
Can't tell	-	-	-	-	23	**-**
Where Riding						
Road	69	75	81	70	73	**3**
Footpath	31	25	19	30	27	**-3**
Base:	***50***	***110***	***104***	***112***	***105***	

- Cyclist movement volumes during the evening remained relatively steady, reaching the greatest peak between 6:00am and 6:09am (9 movements). In 2010, the greatest peak occurred forty minutes later, between 6:40 and 6:49 in 2011.

Figure 4.3: Evening Peak Cyclist Frequency

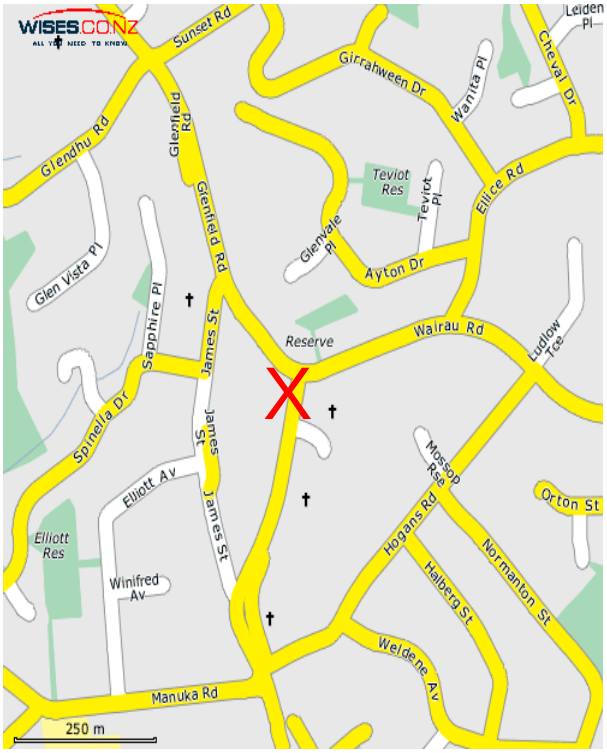
Taharoto/Northcote Road (n)

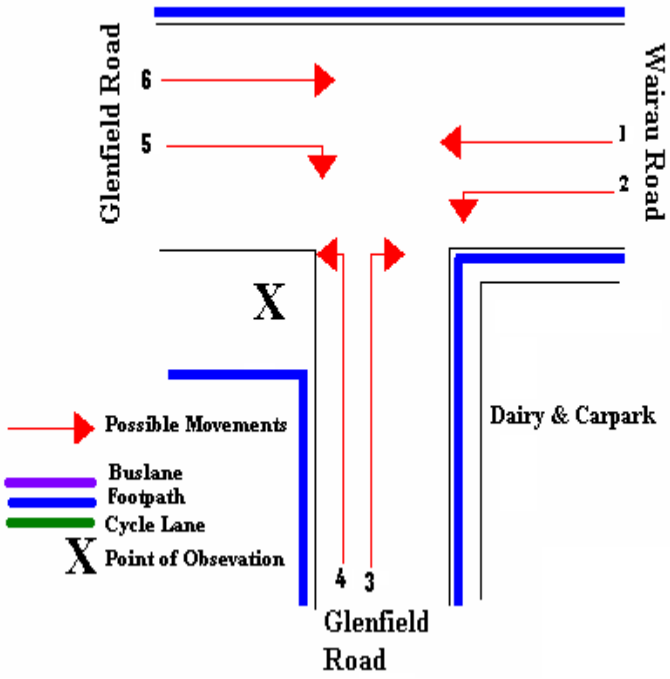


5. WAIRAU ROAD/GLENFIELD ROAD, GLENFIELD (SITE 41)

Figure 5.1 shows the possible cyclist movements at this intersection.

Figure 5.1: Cycle Movements: Wairau/Glenfield Road





5.1 Site Summary

	Raw Counts			AADT
	Morning Peak	*Evening Peak*	*Total*	*Total*
2007	34	30	64	93
2008	39	34	73	107
2009	42	38	80	117
2010	38	53	91	131
2011	**41**	**52**	**93**	**134**

5.2 Morning Peak

Environmental Conditions

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

Key Points

- Cyclist movements increased slightly in 2011 (41 movements compared to 38 movements in 2010).
- The most common movement in the morning is northwest along Glenfield Road (Movement 4 = 13 cyclists).
- Morning cyclist volumes at half of the movements increased, the largest gain occurring at Movement 3 (up 5 movements) and decreased at the other half, the largest loss occurring at Movement 4 (down 4 movements).

Table 5.1: Morning Cyclist Movements

Wairau/Glenfield Road 2007-2011 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11
1	2	6	8	9	6	**-3**
2	2	4	1	1	0	**-1**
3	4	2	3	1	6	**5**
4	11	11	17	17	13	**-4**
5	9	8	4	4	8	**4**
6	6	8	9	6	8	**2**
Total	**34**	**39**	**42**	**38**	**41**	**3**

- Over the morning peak, adults comprise the greatest share of cycle movements (98 per cent, stable from 97 per cent in 2010).
- Most cyclists were wearing a helmet at this site (98 per cent, slightly up from 95 per cent in 2010).
- The majority of cyclists were male (93 per cent).
- Although down notably from 2010 counts, the majority of cyclists were riding on the road (83 per cent, down from 97 per cent last year).

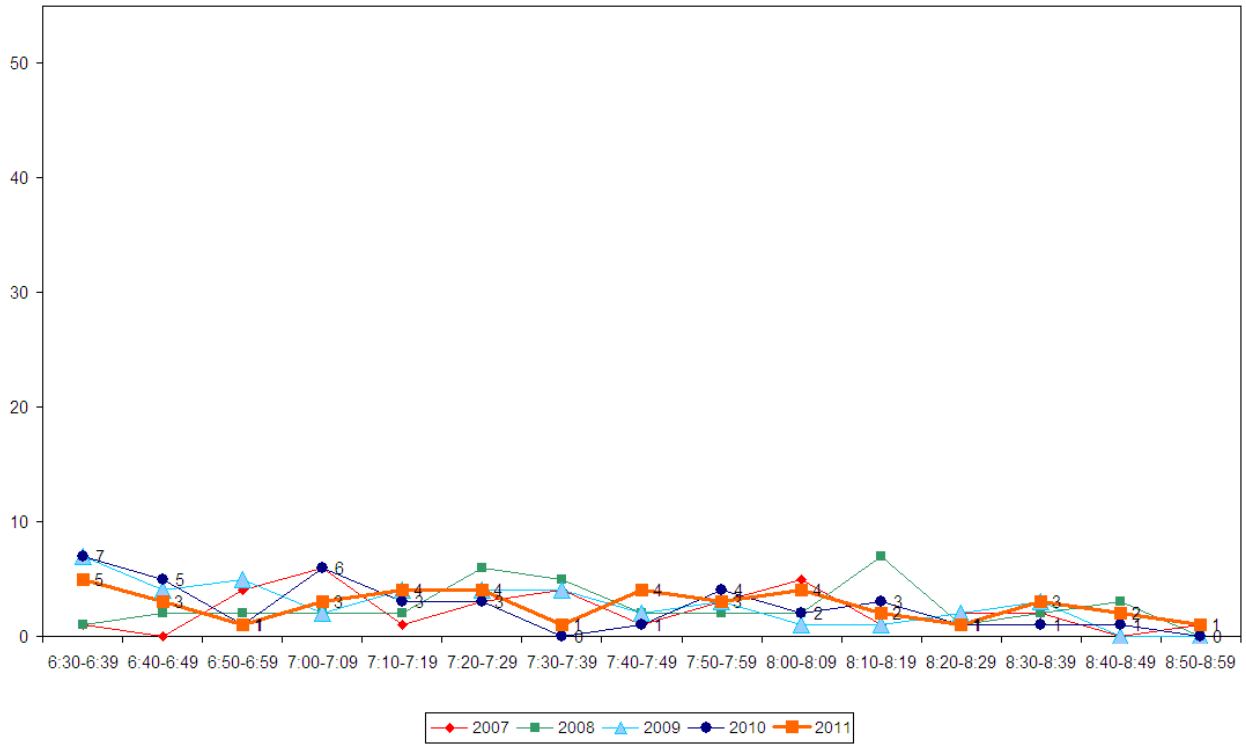
Table 5.2: Morning Cyclist Characteristics
Wairau/Glenfield Road 2007-2011 (%)

	2007	*2008*	*2009*	*2010*	*2011*	Change 10-11
Cyclist Type						
Adult	91	87	93	97	98	**1**
School child	9	13	7	3	2	**-1**
Helmet Wearing						
Helmet on head	82	97	100	95	98	**3**
No helmet	18	3	0	5	2	**-3**
Gender						
Male	-	-	-	-	93	**-**
Female	-	-	-	-	7	**-**
Can't tell	-	-	-	-	0	**-**
Where Riding						
Road	62	82	95	97	83	**-14**
Footpath	38	18	5	3	17	**14**
Base:	***34***	***39***	***42***	***38***	***41***	

- The volume of morning cycle movements is low throughout the shift, with the largest volume of cyclist movements observed in the first ten minute interval (6:30am and 6:39am = 5 movements), the same time as in 2010 (7 movements). After this, no more than 4 movements were observed in any ten minute interval.

Figure 5.2: Morning Peak Cyclist Frequency

Wairau/Glenfield Road (n)



5.3 Evening Peak

Environmental Conditions

- The weather was overcast but fine throughout the evening monitoring period, with the exception of light drizzle at 6:45pm.
- There were no road works or accidents that may affect cycle counts.

Key Points

- The number of recorded cyclist movements in 2011 differs little from 2010 counts (53 movements, compared with 52 movements in 2010).
- Like 2010, the key movements in the evening are south along Glenfield Road (Movement 5 = 22 cyclists) and straight through Wairau Road into Glenfield Road (Movement 1 = 13 cyclists).
- The most notable changes from last year are at Movement 5 (up 7 cyclists) and Movements 4 and 6 (both down 4 movements).

Table 5.3: Evening Cyclist Movements

Wairau/Glenfield Road 2007-2011 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11
1	6	4	8	14	13	**-1**
2	2	3	1	6	6	**0**
3	3	1	1	0	1	**1**
4	7	5	8	11	7	**-4**
5	8	16	18	15	22	**7**
6	4	5	2	7	3	**-4**
Total	**30**	**34**	**38**	**53**	**52**	**-1**

- Over the evening period, most cyclists using this site are adults (92 per cent, stable from 91 per cent in 2010).
- Helmet wearing continues to be widespread in the evening (98 per cent, up slightly from 94 per cent in 2010).
- The majority of cyclists were male (94 per cent).
- Almost all cyclists are riding on the road (83 per cent, down from 89 per cent in 2010).

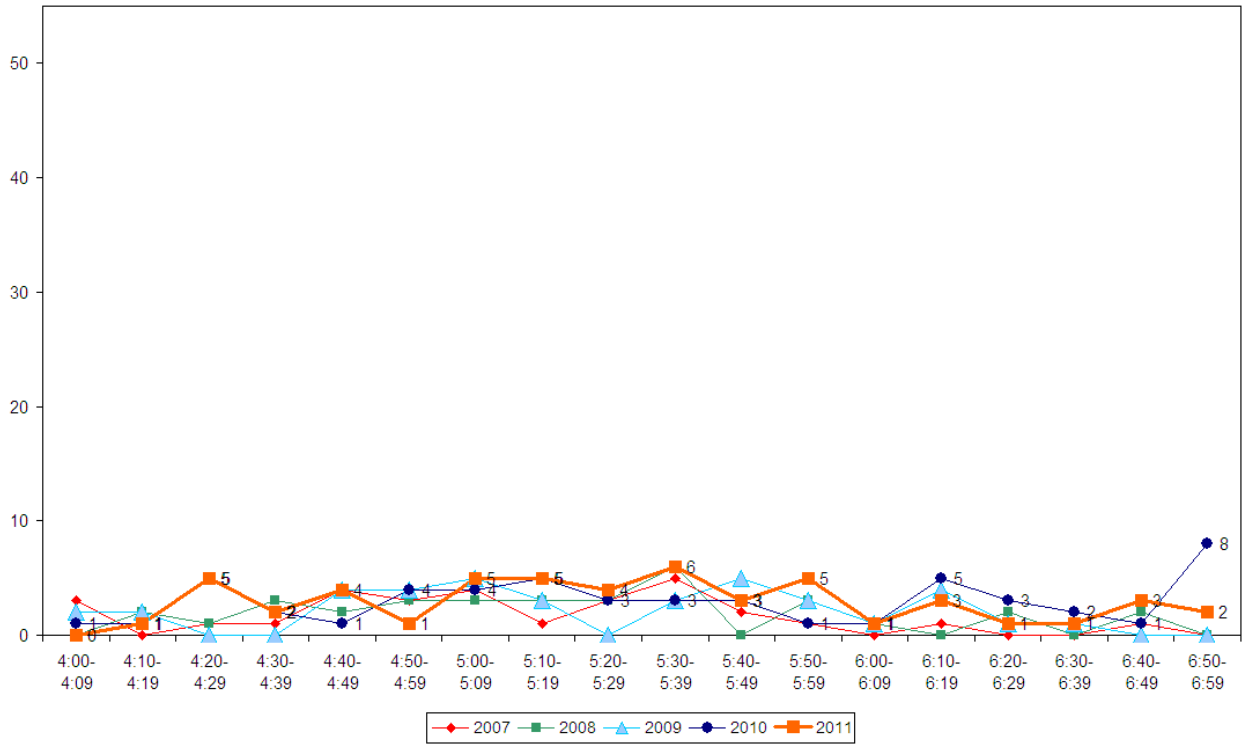
Table 5.4: Evening Cyclist Characteristics
Wairau/Glenfield Road 2007-2011 (%)

	2007	*2008*	*2009*	*2010*	*2011*	Change 10-11
Cyclist Type						
Adult	100	91	95	91	92	**1**
School child	0	9	5	9	8	**-1**
Helmet Wearing						
Helmet on head	87	97	92	94	98	**4**
No helmet	13	3	8	6	2	**-4**
Gender						
Male	-	-	-	-	94	**-**
Female	-	-	-	-	6	**-**
Can't tell	-	-	-	-	0	**-**
Where Riding						
Road	73	85	95	89	83	**-6**
Footpath	27	15	5	11	17	**6**
Base:	***30***	***34***	***38***	***53***	***52***	

- The number of evening cyclist movements remained low throughout the monitoring period, with no more than 5 cyclists recorded during all but one ten minute interval. A slight peak occurred between 5:30pm and 5:39 (6 movements).

Figure 5.3: Evening Peak Cyclist Frequency

Wairau/Glenfield Road

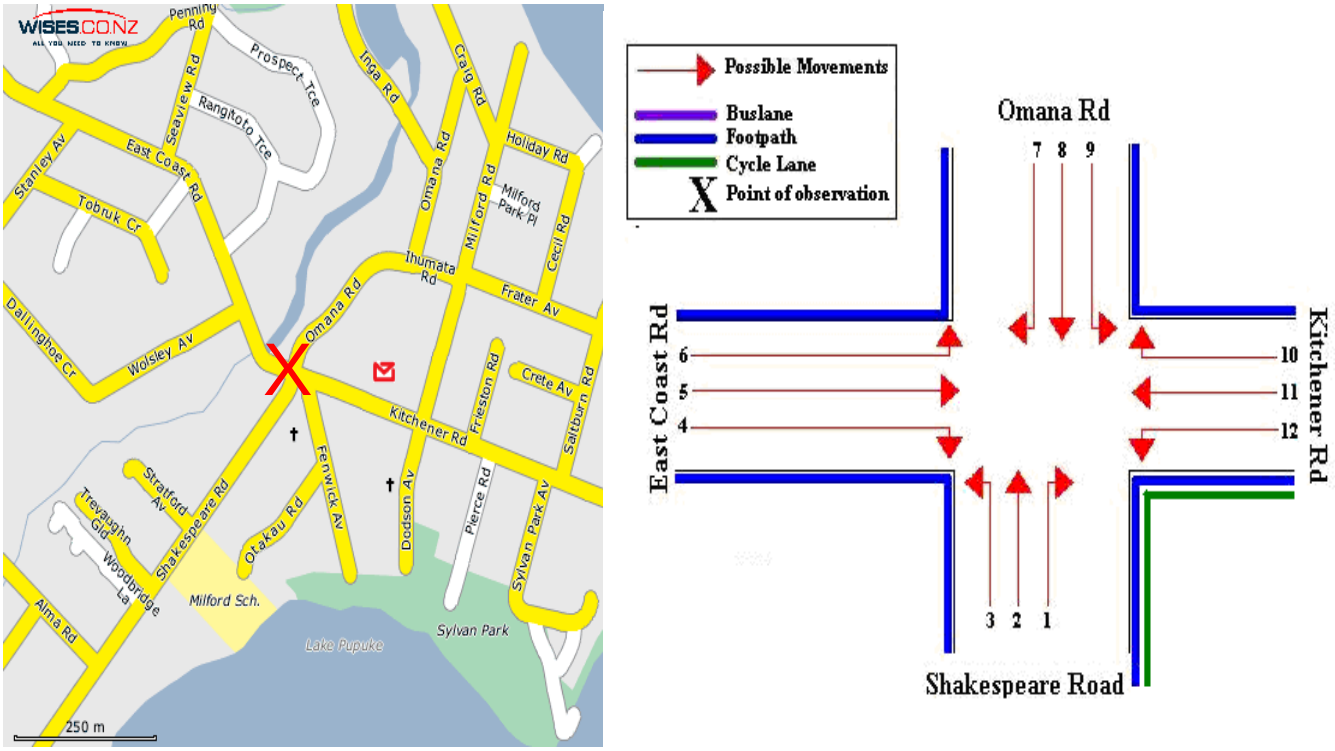


Note: In 2011, three cyclists were observed riding together at this site at 4:27pm. This equates to 6 per cent of all evening peak cyclists at this site.

6. SHAKESPEARE ROAD/EAST COAST ROAD, MILFORD (SITE 42)

Figure 6.1 shows the possible cyclist movements at this intersection.

Figure 6.1: Cycle Movements: Shakespeare/East Coast Road



6.1 Site Summary

	Raw Counts			AADT
	Morning Peak	*Evening Peak*	*Total*	*Total*
2007	82	55	137	314
2008	127	123	250	364
2009	177	133	310	454
2010	146	159	305	442
2011	**181**	**105**	**286**	**422**

6.2 Morning Peak

Environmental Conditions

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

Key Points

- The volume of cyclist movements recorded at the Shakespeare/East Coast Road intersection in 2011 is greater than last year (181 movements, up from 146 movements in 2010).
- The most common movement is turning left from Kitchener Road onto Shakespeare Road heading south (Movement 12 = 70 movements).
- The most notable change occurred at Movement 12 (up 40 movements). Other changes of note occurred at Movement 5 (down 24 movements) and Movement 1 (up 20 movements).

Table 6.1: Morning Cyclist Movements

Shakespeare/East Coast Road 2007-2011 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11
1	13	7	9	6	26	**20**
2	3	0	3	1	5	**4**
3	1	1	0	4	4	**0**
4	5	8	9	16	24	**8**
5	28	26	96	46	22	**-24**
6	1	0	2	1	1	**0**
7	0	0	0	1	0	**-1**
8	3	6	15	9	6	**-3**
9	2	0	0	2	0	**-2**
10	0	0	0	4	0	**-4**
11	5	13	16	26	23	**-3**
12	21	66	27	30	70	**40**
Total	**82**	**127**	**177**	**146**	**181**	**35**

- Over the morning peak, adults comprise the greatest share of cycle movements (85 per cent, up from 77 per cent last year).
- Almost all cyclists are wearing a helmet (98 per cent, down slightly from 100 per cent in 2010).
- The majority of cyclists were male (73 per cent).
- Approximately three-quarters of cyclists were observed riding on the road (76 per cent, up slightly from 71 per cent in 2010).

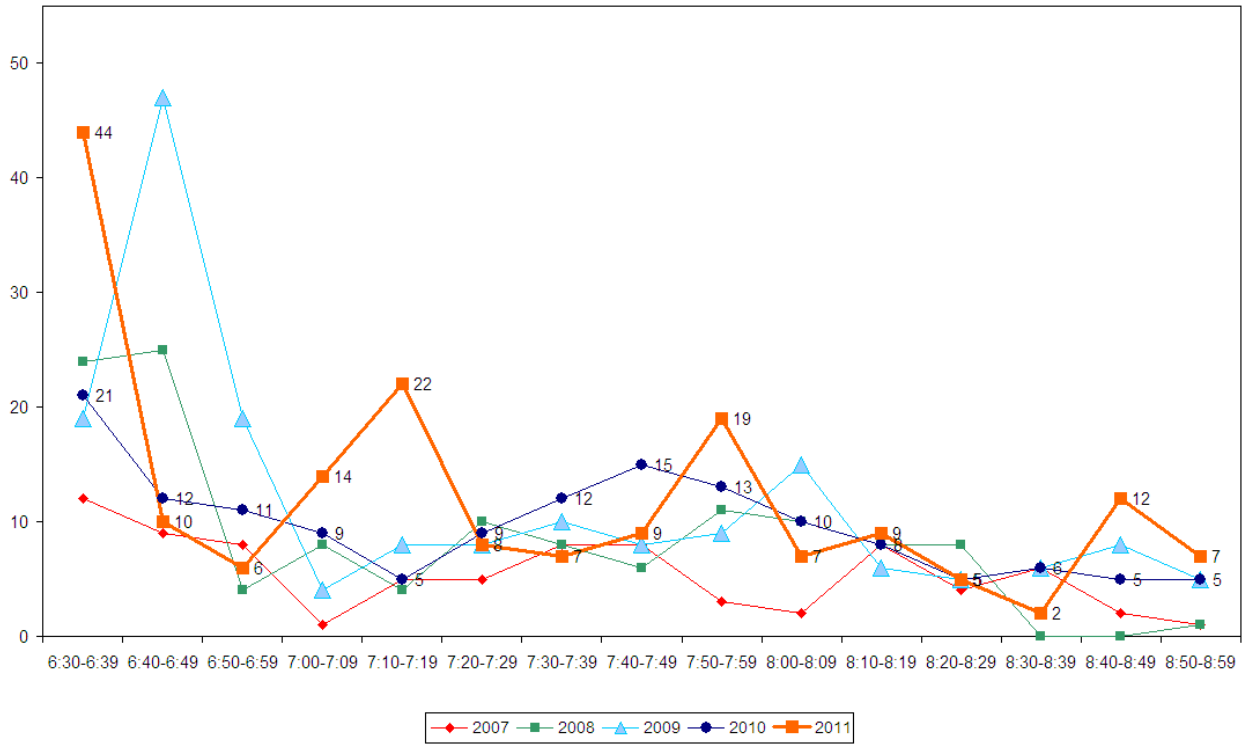
Table 6.2: Morning Cyclist Characteristics

Shakespeare/East Coast Road 2007-2011 (%)

	2007	*2008*	*2009*	*2010*	*2011*	Change 10-11
Cyclist Type						
Adult	83	82	83	77	85	**8**
School child	17	18	17	23	15	**-8**
Helmet Wearing						
Helmet on head	96	98	98	100	98	**-2**
No helmet	4	2	2	0	2	**2**
Gender						
Male	-	-	-	-	73	-
Female	-	-	-	-	23	-
Can't tell	-	-	-	-	4	-
Where Riding						
Road	77	81	79	71	76	-
Footpath	23	19	21	29	18	-
Off-road cycle way	-	-	-	-	6	-
Base:	***82***	***127***	***177***	***146***	***181***	

- Similar to last year, morning cyclist movement numbers start off with a notable peak between 6:30am and 6:39am (44 movements). Three peaks of declining volume follow, one between 7:10am and 7:19am (22 movements), the second between 7:50am and 7:59am (19 movements), and the third between 8:40am and 8:49am (12 movements).

Figure 9.2: Morning Peak Cyclist Frequency
Shakespeare/East Coast Road (n)



Note: In 2011, 28 per cent of the total cycle movements in the morning peak were identified as cycling in groups. Three or more cyclists were observed travelling in groups at this site at the following times:

- *Ten cyclists at 6.30am*
- *Five cyclists at 6:34am*
- *Nine cyclists at 6:37am*
- *Seven cyclists at 6:38am*
- *Three cyclists at 7:11am*
- *Seven cyclists at 7:13am*
- *Three cyclists at 7:14am*
- *Six cyclists at 7:50am*

6.3 Evening Peak

Environmental Conditions

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

Key Points

- The volume of evening cyclist movements recorded at the Shakespeare/East Coast Road intersection in 2011 is notably less than last year (105 movements, down from 159 movements in 2010).
- The most common movements in the evening are the left turn from Kitchener Road onto Shakespeare Road travelling in a south-westerly direction (Movement 12 = 29 movements) and straight along Kitchener Road into East Coast Road travelling in a north-westerly direction (Movement 11 = 27 movements).
- The most notable changes since 2010 have been at Movement 1 (up 17 movements), Movement 5 (down 14 movements), and Movement 11 (down 13 movements).

Table 6.3: Evening Cyclist Movements

Shakespeare/East Coast Road 2007-2011 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11
1	5	15	5	28	11	**17**
2	3	2	8	11	6	**5**
3	6	1	5	5	7	**2**
4	2	4	6	3	1	**-2**
5	6	11	12	21	7	**-14**
6	4	3	3	2	6	**4**
7	0	0	0	2	0	**-2**
8	1	3	2	8	10	**2**
9	0	0	1	1	0	**-1**
10	0	0	2	0	1	**1**
11	13	27	47	40	27	**-13**
12	15	57	42	38	29	**-9**
Total	**55**	**123**	**133**	**159**	**105**	**-54**

- Over the evening peak, the majority of cyclists using this intersection are adults (80 per cent, up from 74 per cent last year).
- Most cyclists are wearing a helmet (90 per cent, down from 99 per cent in 2010).
- The greatest share of evening cyclists are male (81 per cent).
- Nearly two thirds of cyclists were riding on the road (64 per cent, up slightly from 60 per cent last year).

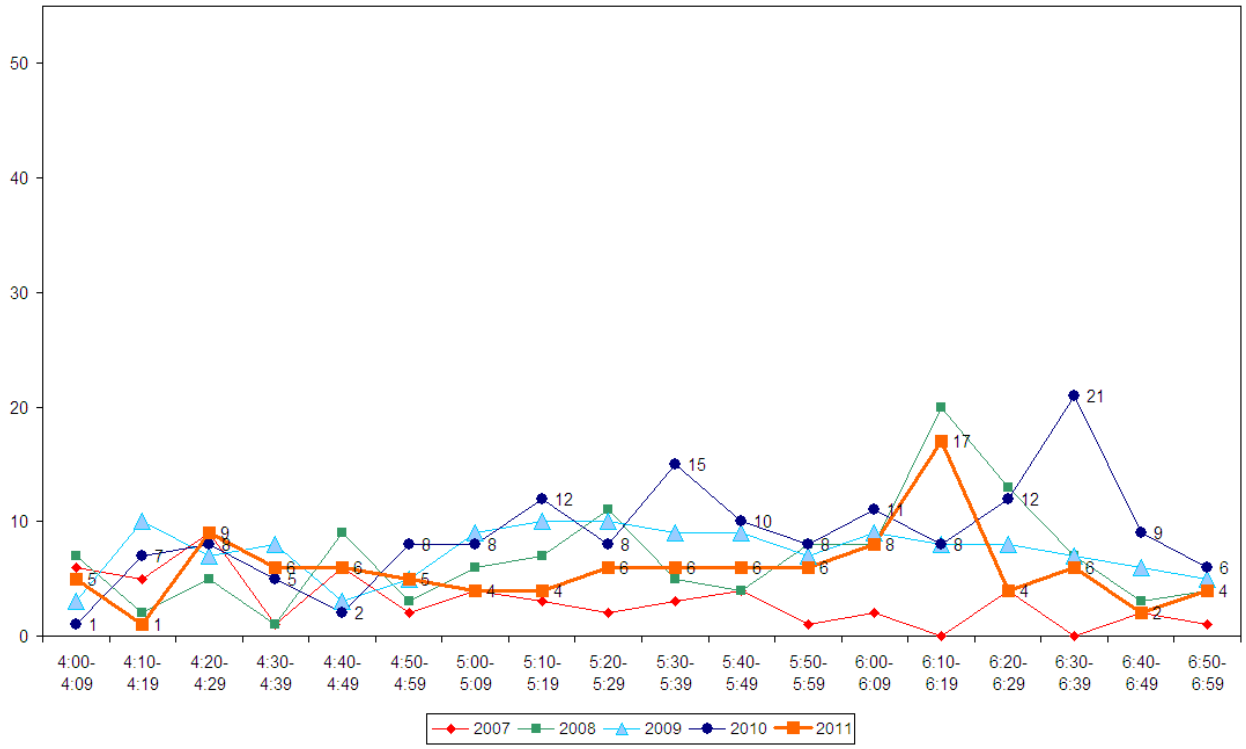
Table 6.4: Evening Cyclist Characteristics

Shakespeare/East Coast Road 2007-2011 (%)

	2007	*2008*	*2009*	*2010*	*2011*	Change 10-11
Cyclist Type						
Adult	82	76	81	74	80	**6**
School child	18	24	19	26	20	**-6**
Helmet Wearing						
Helmet on head	82	94	97	99	90	**-9**
No helmet	18	6	3	1	10	**9**
Gender						
Male	-	-	-	-	81	**-**
Female	-	-	-	-	19	**-**
Can't tell	-	-	-	-	0	**-**
Where Riding						
Road	73	72	69	60	64	**-**
Footpath	27	28	31	40	17	**-**
Off-road cycle way	-	-	-	-	19	**-**
Base:	***55***	***123***	***133***	***159***	***105***	

- The volume of cycle movements remained stable for most of the observation period, only showing a notable peak between 6:10pm and 6:19pm (17 movements). In 2010, the greatest peak was observed 20 minutes later than this year, between 6:30pm and 6:39pm (21 cyclists).

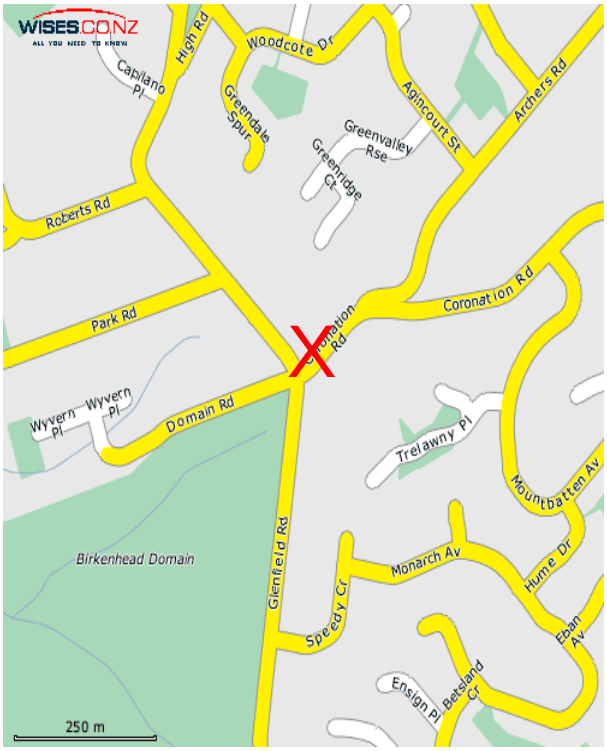
Figure 6.3: Cyclist Frequency
Shakespeare/East Coast Road (n)

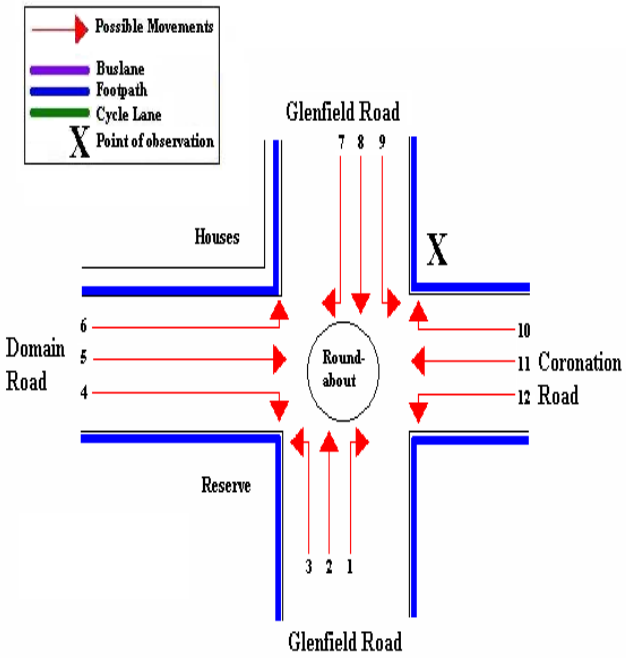


7. GLENFIELD ROAD/CORONATION ROAD, HILLCREST (SITE 43)

Figure 7.1 shows the possible cyclist movements at this intersection.

Figure 7.1: Cycle Movements: Glenfield/Coronation Road





7.1 Site Summary

	Raw Counts			AADT
	Morning Peak	*Evening Peak*	*Total*	*Total*
2007	16	12	28	64
2008	36	39	75	109
2009	36	42	78	113
2010	37	56	93	134
2011	**27**	**25**	**52**	**76**

7.2 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 Glenfield/Coronation Road intersection decreased slightly from last year (27 movements, down from 37 movements in 2010
- The key movement in the morning is straight through Glenfield Road heading north (Movement 2 = 10 cyclists).
- Movements 8 and 9 saw the greatest change in morning cyclist movement numbers (both down 7 movements).

Table 7.1: Morning Cyclist Movements

Glenfield/Coronation Road 2007-2011 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11
1	2	7	13	6	4	**-2**
2	1	5	5	7	10	**3**
3	0	0	0	0	0	**0**
4	0	0	0	0	1	**1**
5	0	0	0	0	0	**0**
6	0	0	0	0	0	**0**
7	0	0	0	0	0	**0**
8	7	9	6	11	4	**-7**
9	6	8	9	9	2	**-7**
10	0	5	3	2	2	**0**
11	0	0	0	0	0	**0**
12	0	2	0	2	4	**2**
Total	**16**	**36**	**36**	**37**	**27**	**-10**

- Over the morning peak, adults comprise the greatest share of cycle movements (85 per cent, stable from 84 per cent in 2010).
- All cyclists are wearing a helmet (100 per cent, up slightly from 95 per cent in 2010).
- The majority of cyclists were male (70 per cent).
- Most cyclists were riding on the road (81 per cent, up from 76 per cent in 2010).

Table 7.2: Morning Cyclist Characteristics

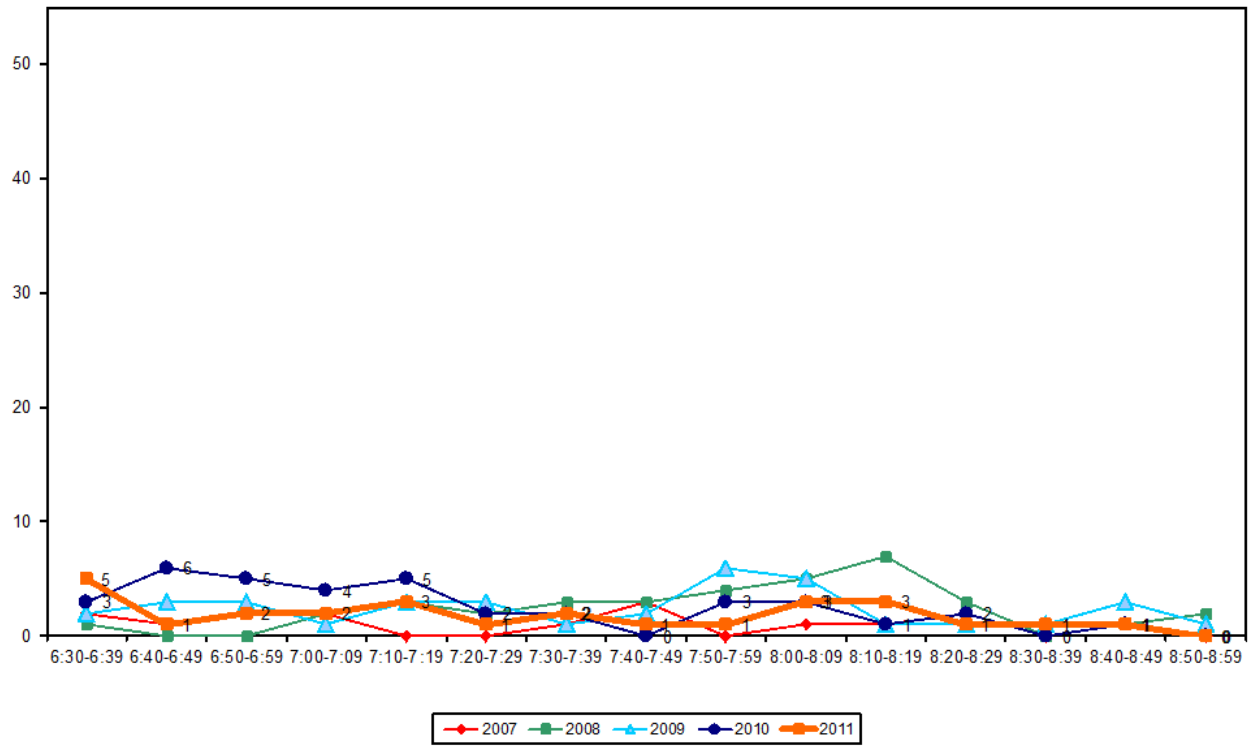
Glenfield/Coronation Road 2007-2011 (%)

	2007	*2008*	*2009*	*2010*	*2011*	Change 10-11
Cyclist Type						
Adult	94	83	75	84	85	**1**
School child	6	17	25	16	15	**-1**
Helmet Wearing						
Helmet on head	87	100	97	95	100	**5**
No helmet	13	0	3	5	0	**-5**
Gender						
Male	-	-	-	-	70	**-**
Female	-	-	-	-	30	**-**
Can't tell	-	-	-	-	0	**-**
Where Riding						
Road	87	83	69	76	81	**5**
Footpath	13	17	31	24	19	**-5**
Base:	***16***	***36***	***36***	***37***	***27***	

- Morning cyclist movement volumes are low over the entire monitoring period. No more than three cyclists were recorded during any of the ten minute intervals except the first one (6:30am and 6:39am = 5 movements). This is similar to last year's observations.

Figure 7.2: Morning Peak Cyclist Frequency

Glenfield/Coronation Road (n)



7.3 Evening Peak

Environmental Conditions

- The weather was fine throughout most of the evening peak, with the exception of light drizzle from 6:35pm.
- There were no road works or accidents that may affect cycle counts.

Key Points

- The total number of cyclist movements recorded at the Glenfield/Coronation Road intersection in the evening decreased notably from 2010 (25 movements, down from 56 movements last year).
- The key movement in the evening is travelling straight through Glenfield Road heading north (Movement 2 = 9 movements).
- All but one movement (Movement 1, up 1 movement) saw a decrease or no change in number of movements observed. The most notable changes were at Movement 9 (down 9 movements), Movement 10 (down 8 movements), and Movement 2 (down 7 movements).

Table 7.3: Evening Cyclist Movements

Glenfield/Coronation Road 2007-2011 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11
1	0	3	6	1	2	**1**
2	4	6	7	16	9	**-7**
3	0	3	0	0	0	**0**
4	0	0	0	0	0	**0**
5	0	0	0	0	0	**0**
6	0	0	0	0	0	**0**
7	0	0	0	0	0	**0**
8	5	6	8	9	7	**-2**
9	0	4	3	9	0	**-9**
10	1	4	6	11	3	**-8**
11	0	0	0	0	0	**0**
12	2	13	12	10	4	**-6**
Total	**12**	**39**	**42**	**56**	**25**	**-31**

- All cyclists at this location were adults (100 per cent, up from 89 per cent in 2010).
- Almost all cyclists were wearing a helmet (96 per cent, slightly up from 91 per cent in 2010).
- The majority of cyclists were male (96 per cent, 4 per cent were female, and none were unidentified).
- All cyclists were riding on the road (up from 77 per cent in 2010).

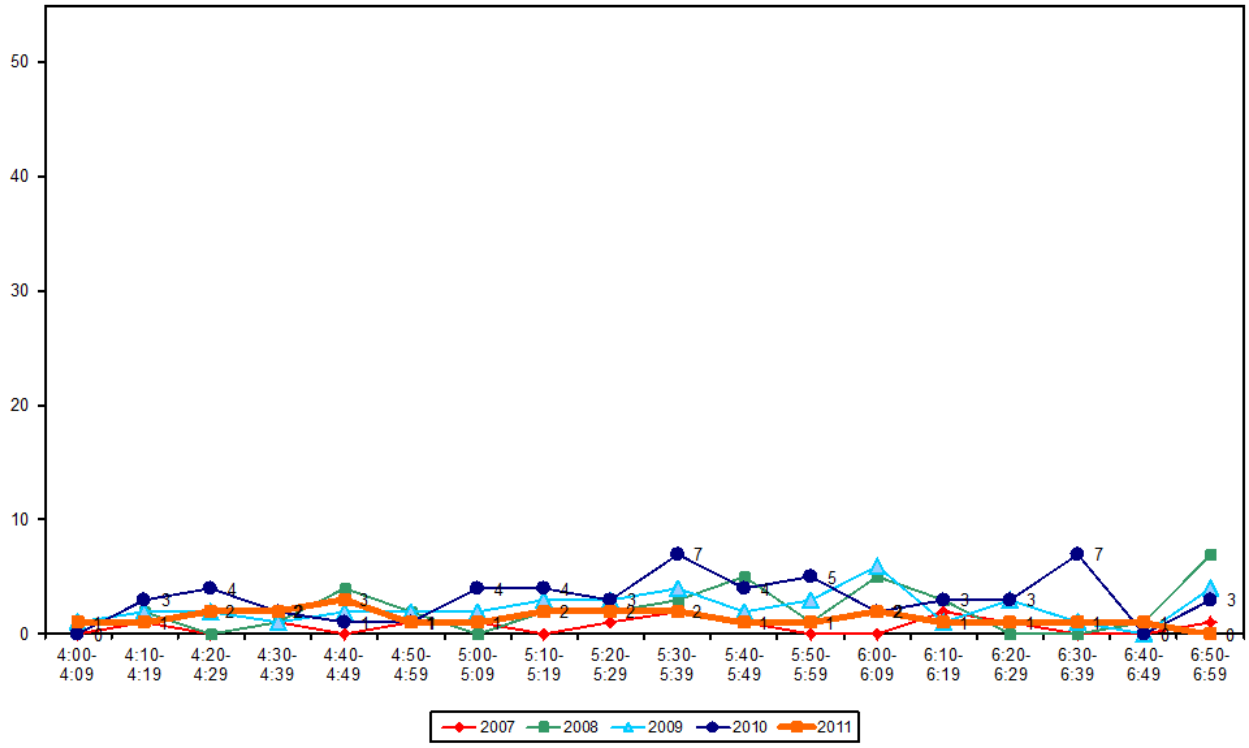
Table 7.4: Evening Cyclist Characteristics

Glenfield/Coronation Road 2007-2011 (%)

	2007	*2008*	*2009*	*2010*	*2011*	Change 10-11
Cyclist Type						
Adult	83	95	76	89	100	**11**
School child	17	5	24	11	0	**-11**
Helmet Wearing						
Helmet on head	75	95	81	91	96	**5**
No helmet	25	5	19	9	4	**-5**
Gender						
Male	-	-	-	-	96	**-**
Female	-	-	-	-	4	**-**
Can't tell	-	-	-	-	0	**-**
Where Riding						
Road	83	77	69	77	100	**23**
Footpath	17	23	31	23	0	**-23**
Base:	***12***	***39***	***42***	***56***	***25***	

- Evening cyclist movement volumes remained low throughout the observation period, only going above two cyclists per 10 minute interval once, between 4:40pm and 4:49pm (3 movements).

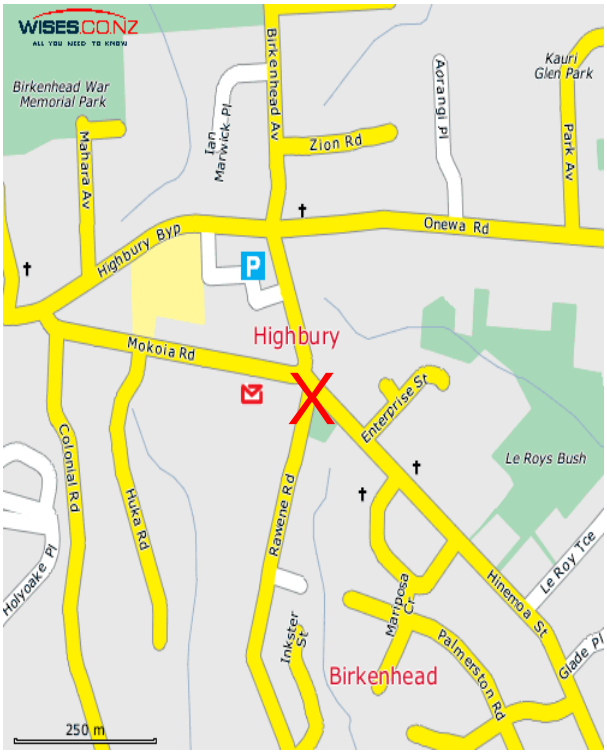
Figure 7.3: Evening Peak Cyclist Frequency
Glenfield/Coronation Road (n)

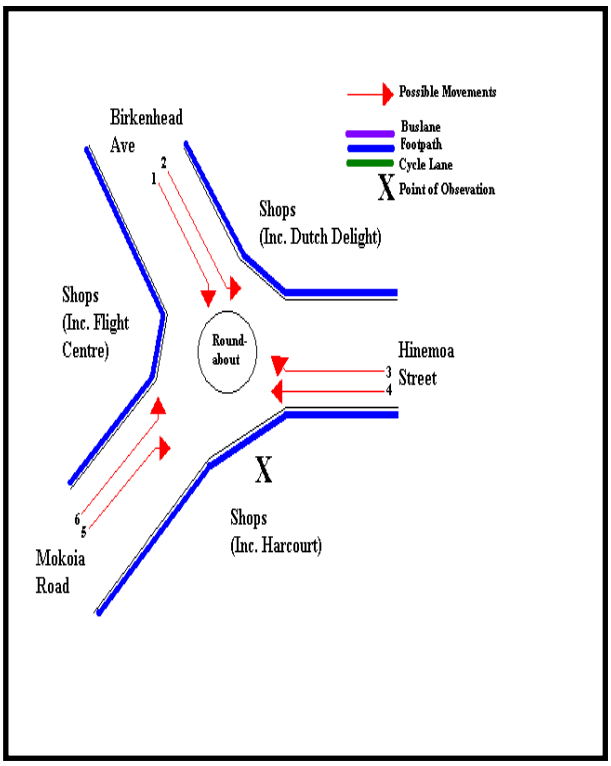


8. BIRKENHEAD AVENUE/MOKOIA ROAD, BIRKENHEAD (SITE 44)

Figure 8.1 shows the possible cyclist movements at this intersection.

Figure 8.1: Cycle Movements: Birkenhead/Mokoia Road





8.1 Site Summary

	Raw Counts			AADT
	Morning Peak	*Evening Peak*	*Total*	*Total*
2007	20	20	40	58
2008	20	29	49	71
2009	27	30	57	83
2010	29	46	75	108
2011	**22**	**23**	**45**	**65**

8.2 Morning Peak

Environmental Conditions

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

Key Points

- The volume of morning cyclists at the Birkenhead Avenue/Mokoia Road intersection has decreased slightly from last year (down from 29 cycle movements to 22).
- The key movement in the morning is turning left from Birkenhead Avenue into Hinemoa Street travelling in a south-easterly direction (Movement 2 = 9 cyclists).
- The most notable changes since 2010 were at Movement 2 (down 7 movements) and Movement 3 (up 5 movements).

Table 8.1: Morning Cyclist Movements

Birkenhead Avenue/Mokoia Road 2007-2011 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11
1	1	1	0	1	1	**0**
2	7	6	12	16	9	**-7**
3	1	4	4	1	6	**5**
4	2	0	0	2	0	**-2**
5	8	7	9	9	5	**-4**
6	1	2	2	0	1	**1**
Total	**20**	**20**	**27**	**29**	**22**	**-7**

- Over the morning peak, almost all cyclists using the Birkenhead Avenue/Mokoia Road intersection were adults (91 per cent, down from 100 per cent in 2010).
- All cyclists were wearing a helmet (100 per cent, up from 90 per cent in 2010).
- All cyclists were male (100 per cent).
- Most cyclists were riding on the road (86 per cent, down from 97 per cent in 2010).

Table 8.2: Morning Cyclist Characteristics

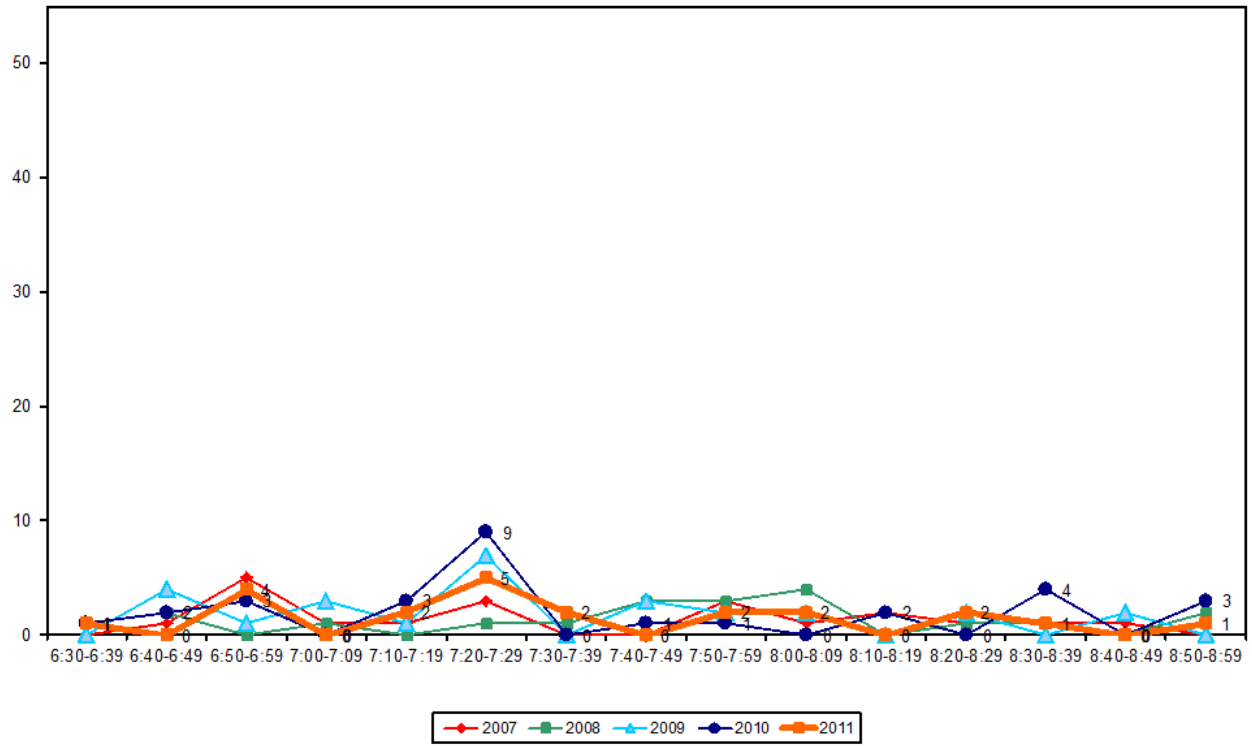
Birkenhead Avenue/Mokoia Road 2007-2011 (%)

	2007	***2008***	***2009***	***2010***	***2011***	**Change 10-11**
Cyclist Type						
Adult	100	95	100	100	91	**-9**
School child	0	5	0	0	9	**9**
Helmet Wearing						
Helmet on head	80	100	96	90	100	**10**
No helmet	20	0	4	10	0	**-10**
Gender						
Male	-	-	-	-	100	**-**
Female	-	-	-	-	0	**-**
Can't tell	-	-	-	-	0	**-**
Where Riding						
Road	90	90	96	97	86	**-11**
Footpath	10	10	4	3	14	**11**
Base:	***20***	***20***	***27***	***29***	***22***	

- The volume of morning cycle movements is low over the entire monitoring period with no more than two movements recorded during most ten minute intervals. A peak occurs once between 6:50am and 6:59am (4 movements) and again between 7:20pm and 7:29pm (5 movements). The second peak time is consistent with the largest peak's time in 2010 (9 movements).

Figure 8.2: Cyclist Frequency

Birkenhead Avenue/Mokoia Road (n)



8.3 Evening Peak

Environmental Conditions

- The weather was fine at the start of the evening shift. Light rain was observed between 6:26pm and 6:52pm.
- There were no road works or accidents that may affect cycle counts.

Key Points

- The volume of morning cyclists at the Birkenhead Avenue/Mokoia Road intersection has decreased notably from last year (down from 46 cycle movements to 23).
- The most common movements in the evening are turning from Hinemoa Road onto Mokoia Road and Birkenhead Avenue, respectively (Movement 3 = 9 movements; Movement 4 = 7 movements).
- The most notable increases are at Movement 3 (down 8 movements) and Movements 1 and 4 (both down 6 movements).

Table 8.3: Evening Cyclist Movements

Birkenhead Avenue/Mokoia Road 2007-2011 (n)

Movement	*2007*	*2008*	*2009*	*2010*	*2011*	Change 10-11
1	1	6	2	8	2	**-6**
2	1	2	3	4	4	**0**
3	8	8	11	17	9	**-8**
4	8	10	12	13	7	**-6**
5	2	2	1	1	0	**-1**
6	0	1	1	3	1	**-2**
Total	**20**	**29**	**30**	**46**	**23**	**-23**

- Over the evening peak, most cyclists using this intersection are adults (91 per cent, up from 87 per cent in 2010).
- Helmet wearing has increased from 2010 (87 per cent, up from 80 per cent in 2010).
- The greatest share of evening cyclists are male (83 per cent).
- A little more than Three-quarters of cyclists were riding on the road (78 per cent, down from 76 per cent at the previous measure).

Table 8.4: Evening Cyclist Characteristics

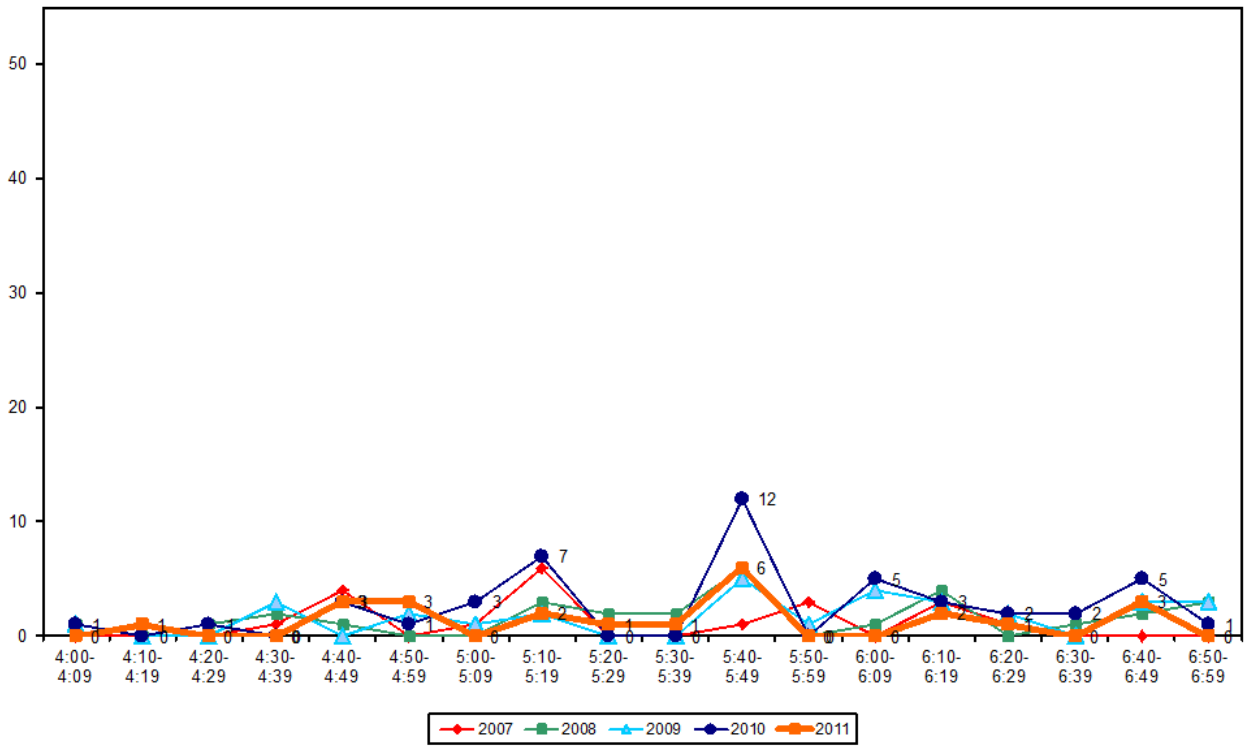
Birkenhead Avenue/Mokoia Road 2007-2011 (%)

	2007	*2008*	*2009*	*2010*	*2011*	Change 10-11
Cyclist Type						
Adult	95	93	93	87	91	**4**
School child	5	7	7	13	9	**-4**
Helmet Wearing						
Helmet on head	95	93	93	80	87	**7**
No helmet	5	7	7	20	13	**-7**
Gender						
Male	-	-	-	-	83	**-**
Female	-	-	-	-	17	**-**
Can't tell	-	-	-	-	0	**-**
Where Riding						
Road	100	93	80	76	78	**2**
Footpath	0	7	20	24	22	**-2**
Base:	***20***	***29***	***30***	***46***	***23***	

- In 2011, the cyclist movement volumes reach no more than three movements per ten minute interval except for the only notable peak between 5:40pm and 5:49pm, when 6 movements were observed. This is the same time as the largest peak observed in 2010.

Figure 8.3: Evening Peak Cyclist Frequency

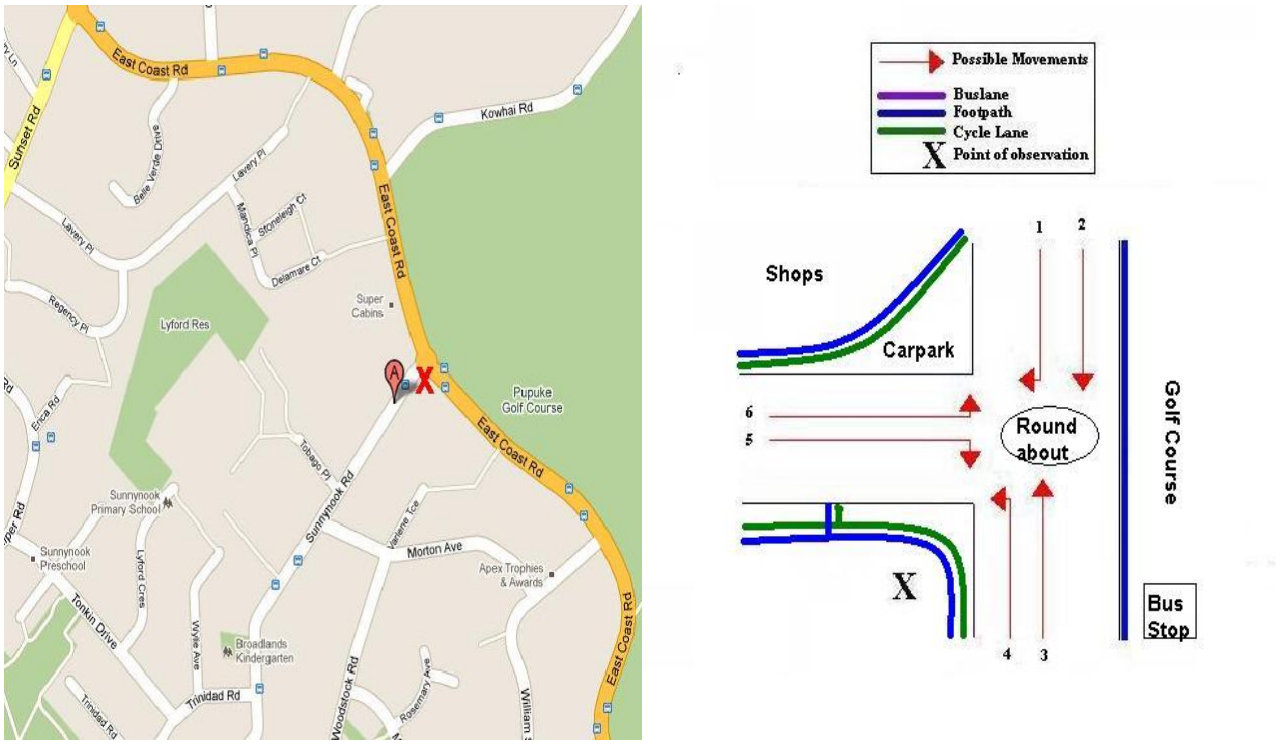
Birkenhead Avenue/Mokoia Road



9. SUNNYNOOK ROAD/EAST COAST ROAD, SUNNYNOOK (SITE 89)

Figure 9.1 shows the possible cyclist movements at this intersection.

Figure 9.1: Sunnynook Road/East Coast Road, Sunnynook



Note: This site was monitored for the first time in 2011.

9.1 Site Summary

	Raw Counts			AADT
	Morning Peak	*Evening Peak*	*Total*	*Total*
2011	**81**	**93**	**174**	**252**

9.2 Morning Peak

Environmental Conditions

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

Key Points

- Eighty-one cyclist movements were recorded at this site in 2011.
- The key morning movement is continuing straight on East Coast Road travelling in a south-easterly direction (Movement 2 = 42 movements).
- As this is a new site in 2011, comparisons with previous years cannot be made.

Table 9.1: Morning Cyclist Movements

Sunnynook Road/East Coast Road, Sunnynook 2011 (n)

Movement	*2011*
1	5
2	42
3	25
4	6
5	0
6	3
Total	**81**

- Over the morning peak, the majority of cyclists were adults (88 per cent).
- Almost all cyclists were wearing a helmet (99 per cent).
- Slightly more than three-quarters of the cyclists were male (77 per cent).
- Most cyclists were riding on the road (79 per cent, 19 per cent were riding on the off-road cycleway).

Table 9.2: Morning Cyclist Characteristics

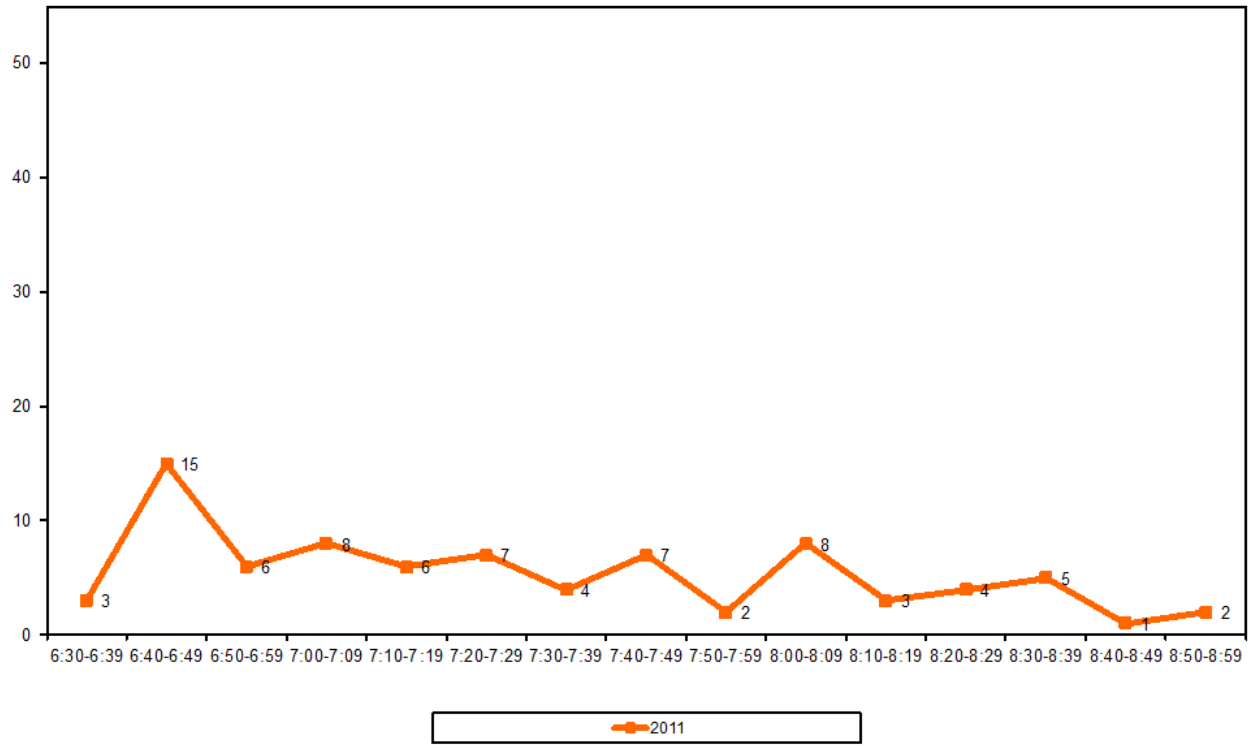
Sunnynook Road/East Coast Road, Sunnynook 2011 (%)

	2011
Cyclist Type	
Adult	88
School child	12
Helmet Wearing	
Helmet on head	99
No helmet	1
Gender	
Male	77
Female	23
Can't tell	0
Where Riding	
Road	79
Footpath	2
Off-road cycle way	19
Base:	***81***

- Morning cyclist movement volumes reached the largest peak early in the observation period (6:40am and 6:49am = 15 movements), then remain relatively stable.

Figure 9.2: Morning Peak Cyclist Frequency

Sunnynook Road/East Coast Road, Sunnynook (n)



9.3 Evening Peak

Environmental Conditions

- The weather was fine throughout the evening shift, with the exception of light rain between 4:33pm and 4:57pm.
- There were no road works or accidents that may affect cycle counts.

Key Points

- Ninety-three cyclist movements were recorded over the evening shift.
- The key movements include continuing straight along East Coast Road in a north/north westerly direction (Movement 3 = 49 movements) and continuing straight on East Coast Road travelling in a south-easterly direction (Movement 2 = 33 movements).
- As this is a new site in 2011, comparisons with previous years cannot be made.

Table 9.3: Evening Cyclist Movements

Sunnynook Road/East Coast Road, Sunnynook 2011 (n)

Movement	***2011***
1	2
2	33
3	49
4	2
5	4
6	3
Total	***93***

- Most cyclists at this site were adults (82 per cent).
- Almost all cyclists were wearing a helmet (97 per cent).
- The majority of cyclists were male (97 per cent).
- More than three quarters of cyclists were riding on the road (78 per cent), while 15 per cent were riding on the off-road cycle way.

Table 9.4: Evening Cyclist Characteristics

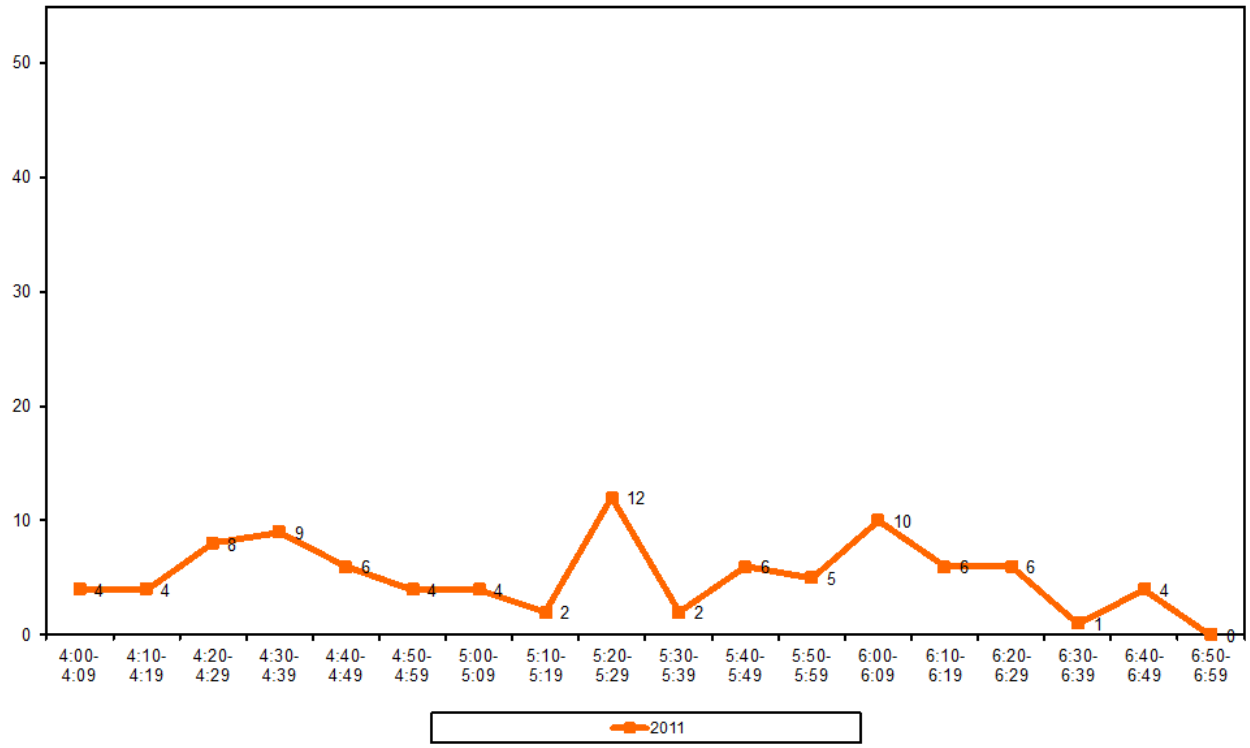
Sunnynook Road/East Coast Road, Sunnynook 2011 (%)

	2011
Cyclist Type	
Adult	82
School child	18
Helmet Wearing	
Helmet on head	97
No helmet	3
Gender	
Male	91
Female	9
Can't tell	0
Where Riding	
Road	78
Footpath	6
Off-road cycle way	15
Base:	***93***

- Cyclist movement volumes reach a slight peak between 4:30pm and 4:39pm (9 movements) then steadily decline until increasing to the greatest peak volume between 5:20pm and 5:29pm.

Figure 9.3: Evening Peak Cyclist Frequency

Sunnynook Road/East Coast Road, Sunnynook (n)



10. NORTH SHORE FERRY WHARVES

Environmental Conditions

- All stationary cycle counts at North Shore ferry wharves were conducted on Wednesday 9th of March (the same day as the manual cycle count).
- Counts at Devonport ferry terminal were conducted at four points in time throughout the day. Counts at all other North Shore ferry wharves were conducted in the morning only (after the morning peak).

Key Points

- In the morning, 5 cycles were observed at the Devonport Ferry Terminal at 6.10am and 47 were observed at 9.10am.
- In the afternoon, 79 cycles were recorded at the Devonport Ferry Terminal at 3.30pm (Note: This includes cycles from a cycle tour) and 11 were observed at 7.10pm.

Table 10.1: Devonport Ferry Terminal Cycle Counts (n)

	2011
Morning Peak	
6:10am	5
9:10am	47
Evening Peak	
3:30pm	79
7:10pm	11

Note: A cycle tour group were observed parking their bikes at the Devonport ferry terminal just prior to 3:00pm.

- After the morning peak, 5 cycles were observed parked at the Bayswater ferry wharf. No cycles were observed at either Northcote or Birkenhead wharves.

Table 10.2: Other North Shore Ferry Wharf Cycle Counts (n)

	2011
Bayswater	5
Northcote	0
Birkenhead	0

11. SCHOOL BIKE SHED COUNT – NORTH SHORE CITY

Note: Full primary schools (those taking children through to Year 8) were included in the count for the first time in 2011.

Background Information

- A total of 13 North Shore ward schools participated in the school bike shed count. Of the schools that participated, none have policies that restrict students cycling to school.
- Northcote Intermediate noted that two classes were away on school camp on the count day, while Westlake Boys High School reported that some students were away at a summer sports tournament during the week their count was undertaken. Consequently, actual cycle numbers for these schools may be higher than those reported here.
- The designated count day was Tuesday 8th of March[10].

Key Points

- Among the surveyed schools, of those eligible to cycle, on average, four per cent of students are cycling to their schools.
- Among the 13 participating schools, n=477 students were reported as cycling to school.
- As in previous years, Belmont Intermediate School reported the highest share of cyclists – 30 per cent of all eligible students currently cycling (down from 33 per cent last year).
- Of the 13 schools that responded, one had no students cycling to school.

[10] The following schools conducted counts on alternative count days
- Northcote College – Monday 22th March
- Westlake Boys High School – Monday 28th March

Table 11.1 shows the results of the 13 schools surveyed in the North Shore ward.

Table 11.1: Summary Table Of School Bike Count

2007-2011 (n)

School Name	*School Type*	*School Roll Eligible To Cycle*	*No. of Cycles Counted*	*Cyclists as share of those eligible*[11]				
				2011	*2010*	*2009*	*2008*	*2007*
Belmont Intermediate	Intermediate	547	165	**30%**	33%	22%	26%	34%
Takapuna Grammar School	Secondary	1620	143	**9%**	8%	9%	6%	8%
Rosmini College	Intermediate/secondary	1001	46	**5%**	3%	3%	4%	3%
Wairau Intermediate School	Intermediate	260	10	**4%**	6%	5%	7%	4%
Westlake Boys High School	Secondary	2251	82	**4%**	3%	2%	<1%	2%
Northcote Intermediate School	Intermediate	249	7	**3%**	5%	2%	3%	2%
Birkdale Intermediate	Intermediate	429	10	**2%**	2%	1%	<1%	-
Glenfield Intermediate School	Intermediate	414	4	**1%**	1%	3%	2%	4%
Birkenhead College	Secondary	800	2	**<1%**	1%	-	-	-
Carmel College	Intermediate/secondary	973	1	**<1%**	0%	0%	<1%	0%
Northcote College	Secondary	1250	1	**<1%**	<1%	0%	-	-
Westlake Girls High School	Secondary	2250	6	**<1%**	<1%	0%	<1%	<1%
St. Mary's School	Full primary	400	0	**0%**	-	-	-	-
Total		**12444**	**477**	**4%**				

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

- Table 11.2 illustrates the rates of cycling to school at different school levels. Rates of cycling to school are highest among intermediate schools (10 per cent, up from 9 per cent in 2010) and lowest for full primary schools (no cyclists).

Table 11.2: Summary Table Of School Bike Count by School Type

2007-2011 (%)

Year Levels	***Number of Schools Responded in 2011***	**Cyclists as share of those eligible**					
		2007	***2008***	***2009***	***2010***	***2011***	**Change 10-11**
Intermediate	5	11%	8%	7%	9%	**10%**	+1
Secondary	5	4%	2%	3%	3%	**3%**	0
Intermediate/Secondary	2	2%	2%	2%	2%	**2%**	0
Full primary	1	-	-	-	-	**0%**	-

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[12] 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)[13], 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.

[12] Annual average daily traffic

[13] 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.

Appendix 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%