Journey to Work Patterns in the Auckland Region

Analysis of Census Data for 2001-2013

Main Report

1 Introduction

The availability of results from the 2013 Census provides the opportunity to identify current journey to work patterns in Auckland and consider how these have been changing over time. This report sets out some of the key findings from the new Census results and provides information on some of the key issues regarding journey to work patterns in the Auckland Region. These include:-

- The numbers using the different transport modes and their shares in regional travel and how these trends have been changing over time.
- The broad travel patterns and links between different areas across the Region, the modes used and again how these have been changing over time.
- The broad travel patterns for each of the Local Board areas.
- The characteristics of travel from each of the Census Area Units for which data is available, including the distances people travel in their journey to work and the modes they use.
- The characteristics of travel to key employment areas within the Region, including the locations from where workers come and the modes they use.
- The characteristics of travel from selected residential areas within the Region, particularly in terms of the modes used and the way in which these have been changing over time.
- The possible impacts of investment in the transport infrastructure and services on travel patterns.

The opportunity has also been taken to examine the extent to which conditions in Auckland compare with those in the four major Australian cities of Sydney, Melbourne, Perth and Brisbane.

In addition a brief analysis has been undertaken of the patterns of population growth along the rail corridors and this is set out in Appendix B.

Definitions of Workers, Jobs and Employment

In the detailed analysis set out in this report from Section 4 onwards it should be noted that we have defined "**workers**" to be those for whom Census Journey to Work information is available to show the mode of travel and specific destination of the journey. For the purposes of this report we have therefore used "**employment**" or "**jobs**" in an area as shorthand for commuting trips with destinations in that area. While this results in employment numbers that are different to those published in alternative sources, such as the Business Demographics Database (BDD) published by Statistics NZ, it remains an appropriate reflection of the destinations and modes used for journeys to work as captured by the Census, and their changes over time.

2 Scope of the Analysis

2.1 Levels of Analysis

The analysis of journey patterns has been undertaken at a number of levels. The first part considers the travel to work characteristics of the Region as a whole, the second part considers movements on a broad sector level and the third at a more disaggregated Local Board level. The subsequent parts look at movement patterns at a more detailed level both for the Region as a whole at a Census Area Unit (CAU) level and also the position for selected employment and residential locations. The final section deals with cross harbour flows on a more aggregated basis.

2.2 Data included in the Analysis

Although the Census aims to collect information on "Main Means of Travel to Work" for all workers, for some of the records the information is incomplete, particularly with regard to the destinations of commuting journeys. For some of these the only information is that they have a destination within the Auckland Region and for others there is no reliable information at all or the trips have a destination outside Auckland. In addition some trips are recorded as "Did Not Go To Work Today" for which there is no information on the mode used.

The initial analysis set out in Section 3 of this report is based on the full data set only excluding the Did Not Go To Work Today journeys and is derived from the Statistics New Zealand website which sets out information at a regional level for a wide range of modal options. The subsequent more detailed analysis in Sections 4-7 is based on data tables provided by Statistics New Zealand for 2001, 2006 and 2013, which link the origins and destinations of commuting journeys and so provide the basis for the more in-depth analysis of travel patterns in the Region but for which some modal options are aggregated because of the potential size of the database. This analysis excludes information on journeys for which the destination is not defined at a CAU level. As with the initial broad analysis, this also excludes all trips recorded as "Did Not Go to Work Today". Trips to and from the islands have been excluded from this analysis, since the data from these is often difficult to interpret. Finally some adjustment has been made for the rounding used in the preparation of the results.

This process reduces the number of returns used in the detailed analysis from a gross total of just over 650,000 to just under 500,000. The steps of this adjustment are set out in Table 2.1.

Table 2.1
Determination of Data used for Analysis from the 2013 Census Results

Total workers recorded	650,610
Less	
Workplace not identified	*69,375*
Workplace within Auckland Region but not identified more precisely	*30,042(1)*
Did not go to work today	*51,282*
Residence or workplace in the islands or on the water	*3,774*
Rounding	*702*
Total Used for Analysis	**496,110**

Notes (1) Includes an allowance for Inlet-Hobson Bay trips mis-coded

The same adjustments have been applied to the results used from the 2001 and 2006 Censuses and these are set out in Table 2.2.

Table 2.2 Data Estimates for the 2001 and 2006 Censuses		
	2001	**2006**
Total trips recorded	534,564	628,851
Less		
Workplace not identified	88,332	106,461
Workplace within Auckland Region but not identified more precisely	18,174	18,075
Did not go to work today	45,564	46,851
Islands	2,592	2,448
Total	379,902	455,016

It should be noted that in the section of the report where we consider the results from the adjusted datasets, the proportions and commentary are based on the reduced numbers used for analysis.

The availability of the information covering both origins and destinations with this approach allows an assessment to be made of the detailed patterns of movement on a consistent basis. It also provides comparability with information on Australian cities which is considered later in this report, for which similar adjustments to the data were undertaken.

2.3 Journey Types

For the initial assessment at a broad regional level, information has been analysed for the following journey types recorded in the Census responses as their "Main Means of Travel to Work"[1]:-

- Worked at home[2]
- Drove a private car, truck or van
- Drove a company car, truck or van
- Motor cycle or power cycle
- Passenger in a car, truck, van or company bus
- Public bus
- Train
- Bicycle
- Walked or jogged
- Other
- Not elsewhere included

It should be noted that for many of these, the full journey will involve the use of more than one than one mode, for example walking or catching a bus to a rail station. The results recorded are for movements classified by the main mode as defined above.

[1] Main means of travel to work is the method a person aged 15 years and over used to travel the longest distance to their place of employment on census day (for example, by car, bus, train, walking or jogging or cycling). In some instances multiple modes will be used for example catching a bus to a rail station, undertaking the journey by rail and then walking to the destination, but it is the mode used for the longest distance of these which the respondants are asked to report.

[2] Note that inconsistencies can occur when comparing 'Worked at home' counts from travel to work variable with 'Work at home' for workplace address indicator variable due to differences in the reference period. The travel to work question is based on the one day, Tuesday, 5 March 2013, while the work questions are based on the seven days ended Sunday, 3 March 2013.

For the more detailed assessment of the patterns of traffic the journey types considered are:-

- Worked at home
- Private vehicle use – driver or passenger in a car, truck or van, passenger in a company bus and motorcycle or powered cycle user.
- Bus user
- Train user
- Walked or jogged
- Bicycle
- Other/Not elsewhere included which includes ferry

These have been aggregated where appropriate.

It should be noted that the trips recorded are those for the journey to work only and would exclude others such as those undertaken for educational, social business and other purposes. In addition while most journey to work trips are undertaken in the morning peak, the totals from the Census include those undertaken at other times of the day.

It should also be noted that because journeys can involve more than one mode, measures of distance by mode discussed in the report relate to the main mode identified for the journey and not necessarily for the actual distance travelled by the particular mode. The distances themselves are based on the road distances between the individual CAUs. This is discussed in more detail in Section 4.

3 Overall Travel Patterns for the Auckland Region

Key Highlights

- In 2013 the total numbers of commuters travelling to work or working at home recorded in the Census within the Auckland Region amounted to about 590,000.
- Of these, private vehicle use accounted for 74 per cent of commuting trips in the Auckland Region.
- Public transport (bus and train) accounted for about 7.5 per cent, active modes (walking and cycling) for about 6 per cent and 7.5 per cent worked at home.
- Since 2001, the numbers commuting by public transport have increased by 50 per cent compared to an overall increase of 23 per cent. While rail has had the higher rate of growth (290 per cent), trips by bus account for about 55 per cent of the total increase in public transport.
- While the share of private vehicle use has fallen from 75 per cent in 2006 to 74 per cent in 2013, this reflects a reduction in private transport passenger trips. The share of private transport driver trips has remained constant at 70 per cent.
- Increases in total private vehicle use accounted for about 48 per cent of the growth in commuting trips.
- Compared to Australian cities, Auckland has a low share of public transport use, but high shares of active mode trips and of people working at home.

3.1 The Position in 2013

The breakdown of commuting trips in 2013 by type is set out in Table 3.1 and Figure 3.1.

Table 3.1
2013 Commuting Trips by Mode

Mode	Trips	Per cent of total
Drove a private car, truck or van	340,299	57.8%
Drove a company car, truck or van	65,481	11.1%
Motor cycle or power cycle	5,496	0.9%
Total private vehicle drivers	**411,276**	**69.9%**
Passenger in a car, truck, van or company bus	24,510	4.2%
Total private vehicle users	**435,786**	**74.0%**
Public bus	33,933	5.8%
Train	9,459	1.6%
Total bus and rail users	**43,392**	**7.4%**
Bicycle	6,342	1.1%
Walked or jogged	26,529	4.5%
Total active mode	**32,871**	**5.6%**
Worked at home	**44,253**	**7.5%**
Other	7,989	1.4%
Not elsewhere included	24,492	4.2%
Other /Not elsewhere included	**32,481**	**5.5%**
Total modes considered	**588,783**	**100.0%**
Did not go to work today	*61,827*	
Total workers	*650,613*	

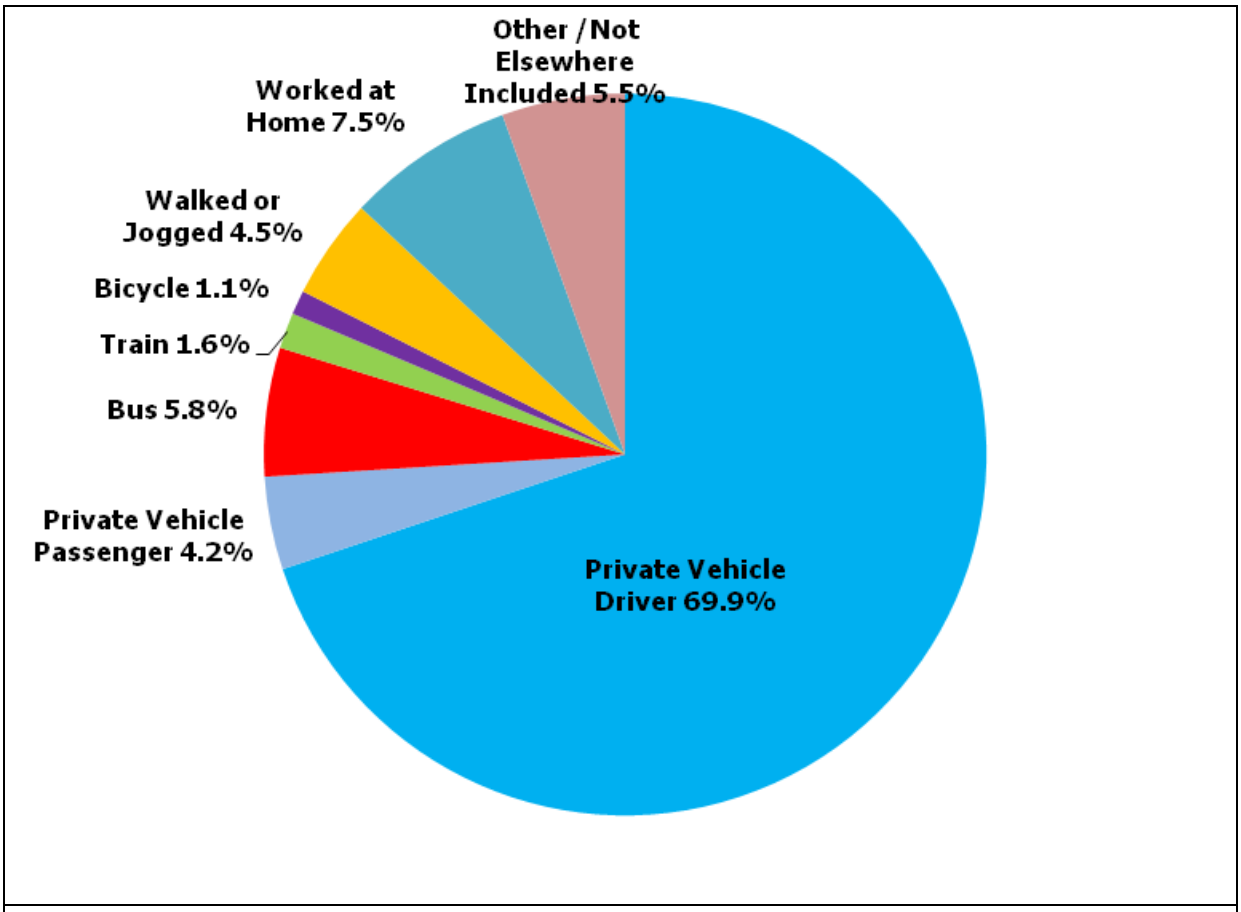


Figure 3.1
2013 Commuting Trips by Mode

In 2013 across the Region as a whole, private vehicle travel accounted for about 74 per cent of all movements. Public transport (bus and train) accounted for about 7 per cent with over three quarters of these journeys travelling by bus. Active modes represented just less than 6 per cent, somewhat less than the share for public transport, with walking and jogging journeys accounting for about 80 per cent of the active mode total. About 8 per cent worked at home, a similar proportion to the numbers travelling by public transport.

3.2 Changes since 2001 and 2006

The numbers of trips and the modal shares have been changing over time. The numbers of commuting journeys by mode over the period from 2001 to 2013 are set out in Table 3.2 and Figure 3.2.

Table 3.2
Changes in Total Commuting Journeys by Mode 2001-2013

Mode	Total trips		
	2001	2006	2013
Drove a private car, truck or van	278,298	325,464	340,299
Drove a company car, truck or van	56,463	68,910	65,481
Motor cycle or power cycle	2,382	3,123	5,496
Total private vehicle drivers	**337,143**	**397,497**	**411,276**
Passenger in a car, truck, ban or company bus	24,060	28,674	24,510
Total private vehicle users	**361,203**	**426,171**	**435,786**
Public bus	26,349	28,566	33,933
Train	2,418	5,655	9,459
Total bus and rail users	**28,767**	**34,221**	**43,392**
Bicycle	4,923	5,016	6,342
Walked or jogged	18,762	24,060	26,529
Total active mode	**23,685**	**29,076**	**32,871**
Worked at home	**37,593**	**40,950**	**44,253**
Other	5,382	6,201	7,989
Not elsewhere included	20,676	32,274	24,492
Other /Not elsewhere included	**26,058**	**38,475**	**32,481**
Total modes considered	**477,306**	**568,893**	**588,783**

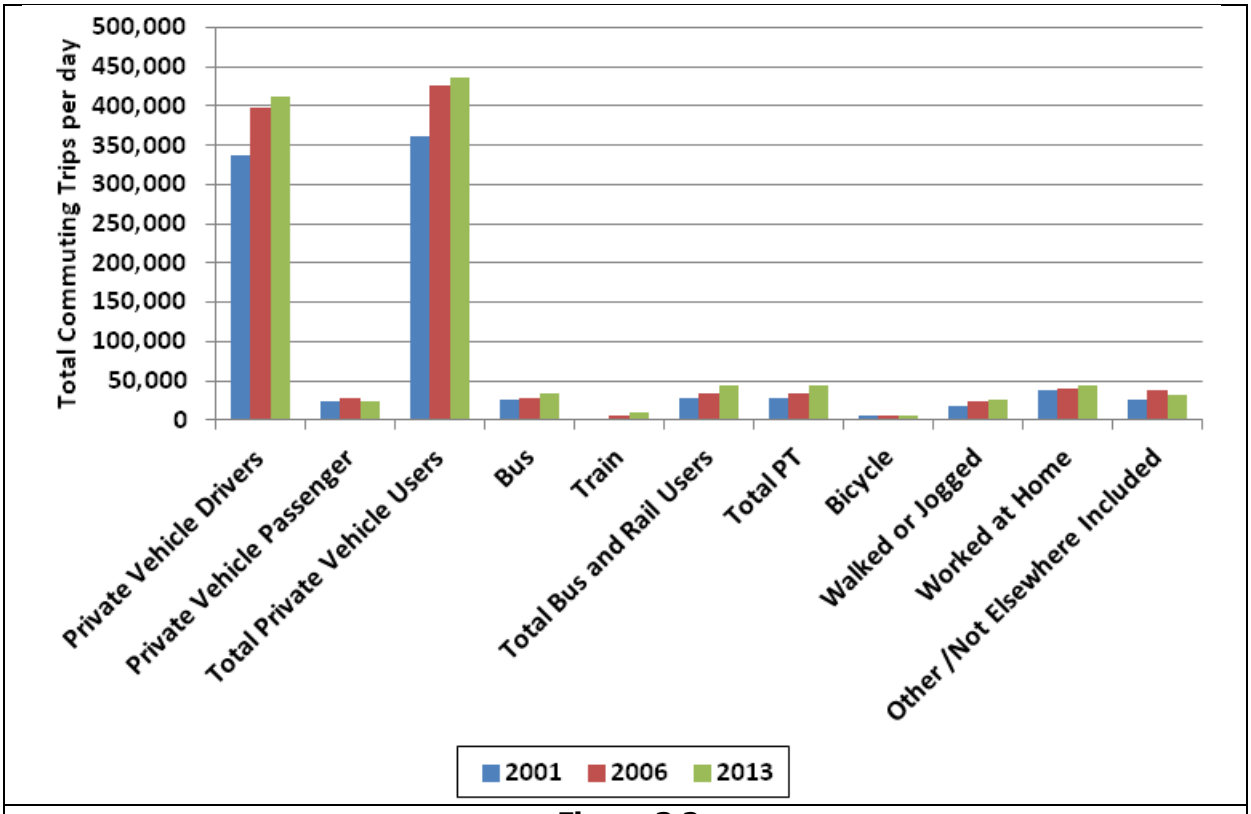


Figure 3.2
Changes in Commuting Journeys by Mode 2001-2013

The changes in the numbers of trips by each mode are set out in Table 3.3 and Figure 3.3

Table 3.3
Changes in Trips made by Mode in the Auckland Region 2001 to 2013

Mode	Change 2001-2013				Change 2006-2013			
	Total		Average Change pa		Total		Average Change pa	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Private vehicle drivers	74,133	22.0%	6,178	1.7%	13,779	3.5%	1,968	0.5%
Private vehicle passengers	450	1.9%	38	0.2%	-4,164	-14.5%	-595	-2.2%
Total private vehicle users	74,583	20.6%	6,215	1.6%	9,615	2.3%	1,374	0.3%
Bus	7,584	28.8%	632	2.1%	5,367	18.8%	767	2.5%
Train	7,041	291.2%	587	12.0%	3,804	67.3%	543	7.6%
Total public transport	14,625	50.8%	1,219	3.5%	9,171	26.8%	1,310	3.5%
Bicycle	1,419	28.8%	118	2.1%	1,326	26.4%	189	3.4%
Walked or jogged	7,767	41.4%	647	2.9%	2,469	10.3%	353	1.4%
Total active modes	9,186	38.8%	766	2.8%	3,795	13.1%	542	1.8%
Worked at home	6,660	17.7%	555	1.4%	3,303	8.1%	472	1.1%
Other	6,423	24.6%	535	1.9%	-5,994	-15.6%	-856	-2.4%
Total to work	111,477	23.4%	9,290	1.8%	19,890	3.5%	2,841	0.5%

Overall, the growth recorded in commuter trips was much slower for the period from 2006 to 2013 reflecting the effects of Global Financial Crisis on employment levels, with the average rate of growth for the period from 2001 to 2006 being 3.0 per cent compared to just 0.5 per cent between 2006 and 2013.

The position for the different modes varies, with for example the rate of growth of bus travel (and the average annual numerical increase) being higher for the period from 2006 to 2013, indicating an acceleration of the growth rate. The same is true for cycling. For all other modes the average increases were lower in the second part of the period than for the period as a whole. It should also be noted that although the numbers of private vehicle driver trips increased over the period from 2006 to 2013, the number of private vehicle passengers declined. These trips may have switched to public transport, contributing to the high growth rates for bus and train.

It should be noted that for some modes, particularly train and in some cases the active modes, the high percentage increases to a certain extent reflect the relatively low numbers travelling in early years rather than large absolute increases. For example over the period from 2006 to 2013 the 7.6 per cent annual increase in rail travel reflects a smaller absolute increase in the numbers travelling by train than the annual growth of 2.5 per cent in bus trips.

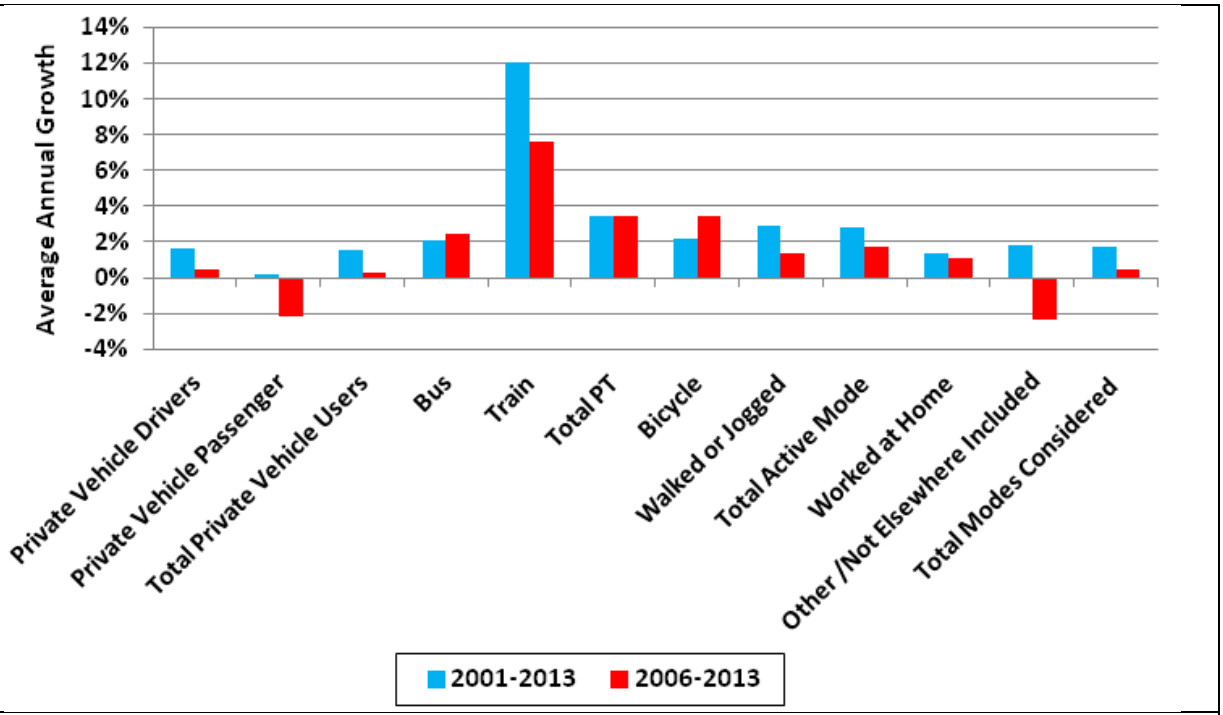


Figure 3.3
Average Annual Growth in Trip Making by Mode 2001 and 2006 to 2013 (per cent)

Over the period as a whole from 2001 to 2013, there was growth in trip making by all modes, with particularly large percentage increases in the numbers travelling by train, by walking or jogging and to a lesser extent by bus and bicycle. Growth in "other" trips which includes ferries may be the result in changes in definition over the period. Over the later part of the period, from 2006 to 2013, there were increases in the growth rates of travel by bus and by bicycle but slower growth rates for train and for walking and jogging and a decline in private vehicle passenger trips. The growth in total private vehicle travel (drivers and passengers) was less than the average for all modes in both time periods but the growth in private vehicle driver trips was broadly in line with the average for all trips over both periods.

The different rates of growth of commuting by the alternative means of transport have resulted in changes in the overall modal shares and these are set out in Table 3.4.

Table 3.4 Changes in Modal Shares						
Mode	**Modal Share (per cent)**			**Change in Modal Share (percentage points)**		
	2001	**2006**	**2013**	**Overall 2001-2013**	**2001-2006**	**2006-2013**
Private vehicle drivers	70.6%	69.9%	69.9%	-0.8%	-0.8%	0.0%
Private vehicle passengers	5.0%	5.0%	4.2%	-0.9%	0.0%	-0.9%
Total private vehicle users	75.7%	74.9%	74.0%	-1.7%	-0.8%	-0.9%
Bus	5.5%	5.0%	5.8%	0.2%	-0.5%	0.7%
Train	0.5%	1.0%	1.6%	1.1%	0.5%	0.6%
Bicycle	1.0%	0.9%	1.1%	0.0%	-0.1%	0.2%
Walked or jogged	3.9%	4.2%	4.5%	0.6%	0.3%	0.3%
Worked at home	7.9%	7.2%	7.5%	-0.4%	-0.7%	0.3%
Other	5.5%	6.8%	5.5%	0.1%	1.3%	-1.2%
Total to work	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%

Over the period from 2001 to 2006, the share of private vehicle use fell by 0.8 percentage points, work at home by 0.7 percentage points, bus by 0.4 points and bicycle by 0.1 point. These were offset by growth in the train share 0.5 percentage points and walking 0.3 points. There was also growth in "other" but this may reflect definitional changes.

To some extent the position for the period from 2006 to 2013 continues these trends with an on-going decline in total private vehicle use (although the share of private transport driver trips has remained constant) and growth in train and in walking, but for bus, bicycle and work at home there were increases compared to the earlier decline.

In more detail over this more recent period the share of private vehicle use in Auckland fell by 0.9 percentage points from 74.9 per cent to 74.0 per cent, and the share of "other" trips also declined by about 1.2 percentage points.

Offsetting these decreases were:-

- Increases in the total public transport mode share of 1.3 percentage points with bus having about 60 per cent of the increase.
- Increases in travel by active modes of about 0.5 percentage points split broadly equally between walking and cycling.
- A small increase in the numbers working at home.

These changes for the period from 2006 to 2013 are summarised in Figure 3.4.

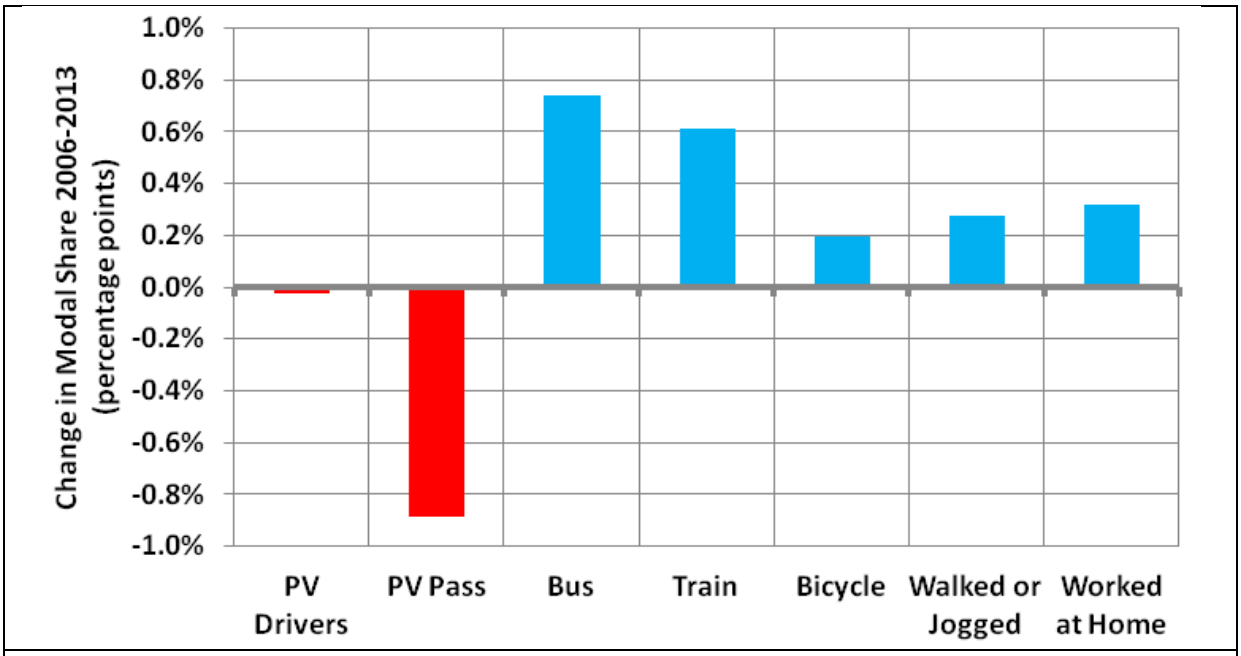
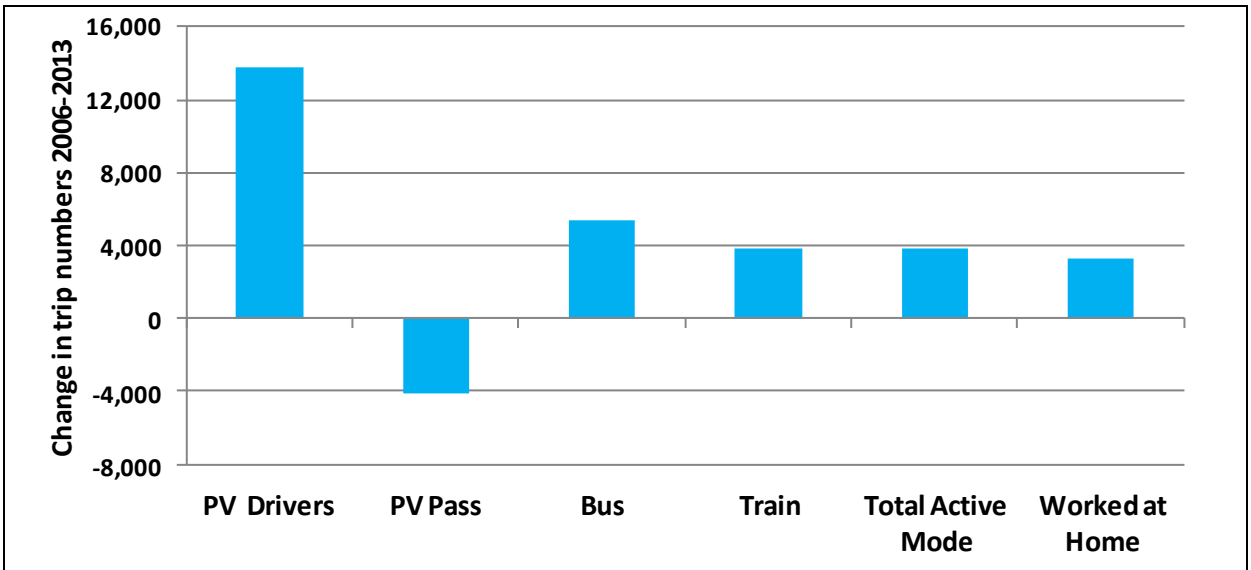


Figure 3.4
Changes in Modal Shares for Commuting Trips 2006-2013 (percentage points)

Although the modal share for total trips by private vehicles has been declining, this needs to be considered in the context of the overall growth of commuting. This is highlighted in Figure 3.5.



Note: The figures in this graph exclude "Other" travel which declined over the period.

Figure 3.5
Contribution to Growth in Commuter Travel by Mode 2006 to 2013

Over the period from 2006 too 2013 the number of private vehicle driver trips increased by almost 14,000 equivalent to about 69 per cent of the total increase in journeys. This gives an indication of the increases in pressure on the road network in the Region and the importance of catering for this in developing the transport network. This growth however, was offset by a decline in the number of trips by private vehicle passengers of some 4,100, giving a net growth in total trips using private vehicles of 9,600 or about 48 per cent of the total increase over the period. This growth in private transport trips was slightly larger than the increase in public transport trips. These public transport trips, grew by about 9,200, a total which presumably includes a large number of journeys previously undertaken as private vehicle passengers. Overall, the contribution from increased bus commuting was also substantial, representing 60 per cent of the increase in combined bus and train use.

3.3 Comparison with Australian cities

Approximate data on transport mode shares for commuters in Sydney, Melbourne, Brisbane and Perth is available for 2011[3], and this, together with the comparable Auckland data, is set out in Figure 3.6. It should be noted that to ensure comparability with the Australian data this figure has been based on the adjusted figures as set out in Table 2.1.

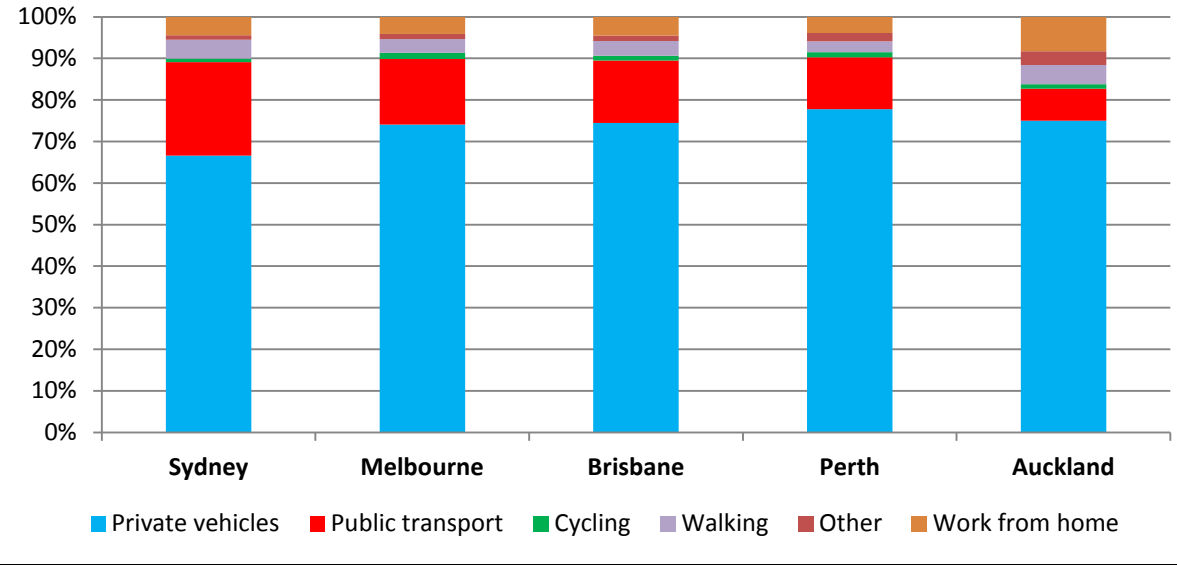


Figure 3.6
Mode splits for Auckland (2013) and Australian Cities (2011)

The key points which emerge from the comparison between the results for Auckland and those for the Australian cities are:-

- A low use of public transport, with a share that is lower than that for Perth and is half that of Melbourne and Brisbane and a third of that of Sydney.
- A high proportion of people working at home.
- A fairly high proportion of walking trips which are higher than all the other cities except Sydney.
- Private vehicle use that is broadly in line with that for Melbourne and Brisbane, is above that for Sydney, and is below that for Perth.

[3] Bureau of Infrastructure, Transport and Regional Economics (BITRE), 2013, *Population growth, jobs growth and commuting flows—a comparison of Australia's four largest cities,* Report 142, Canberra ACT.

4 Journeys to Work by Broad Area

Key Highlights

The Region has been divided into 5 sectors to assist with the analysis by area and to provide comparability with Australian data.

- The CBD accounts for about 14 per cent of trip destinations, the Other Central sector for 9 per cent, the Inner Urban sector for 34 per cent, the Outer Urban sector for 36 per cent and the Rural sector for 8 per cent.
- The central areas have a low proportion of jobs to resident workers whereas the other sectors have more workers than jobs. Away from the centre, most workers have jobs within the sectors where they live and across the Region as a whole, more than half work in the sector where they live.
- For the central areas, only 20 per cent of jobs are filled by resident workers resulting in high inflows from the other areas.
- About 35 per cent of journeys are travelling inwards between sectors and 12 per cent outwards.
- The main growth in commuting trips between 2006 and 2013 has been from the Outer Urban area, which has the highest share of growth to all the other sectors except the outermost Rural area.
- Private vehicle trips account for the majority of travel to all sectors. For journeys to the CBD, bus and train travel account for just over a quarter of the total and active modes for about 12 per cent. The share of private vehicle transport increases with the distance of workplace from the centre (except for the Rural sector where work at home is important) and the shares of bus and rail decease with distance from the centre.
- Trip making to the CBD accounts for 48 per cent of both bus and rail commuting trips, 30 per cent of walk trips and 21 per cent of cycling trips. It only accounts for 10 per cent of private vehicle trips.
- Between 2006 and 2013 the private vehicle share has declined for almost all movements from sectors, but has increased for commuting trips to the Outer Urban and Rural sectors. Bus and train have increased for all movements.
- The average trip length across the Region is about 11.8 kms. This is highest for rail travel at 15.9 kms and for private vehicle travel 13.5 kms.
- Journey distances for all sectors and for all modes except rail have increased between 2006 and 2013.

4.1 Definition of areas

In order to examine movement patterns in more detail, the Auckland Region has been divided into five main zones, in principle forming concentric rings round the central area. In part this division has been undertaken to facilitate comparison with the some of the data for Australian cities presented in the series of reports by the Bureau of Infrastructure, Transport and Regional Economics (BITRE) on the development and transport patterns in Australia's major cities. The BITRE report *Population growth, jobs growth and commuting flows – a comparison of Australia's four largest cities* has been used as a source of comparative data and we have sought to replicate the approach used in the BITRE work in the analysis in this report.

The sectors defined have primarily been based on Local Board areas with the Waitemata Local Board area split between the CBD and the Other Central sector. The correspondence of the sectors to the Local Board areas is set out in Table 4.1 and the position illustrated in Figure 4.1.

Table 4.1
Correspondence of Sectors for Analysis with Local Board Areas

Sector	Local Boards
CBD	Part of Waitemata
Other Central	Remainder of Waitemata
Inner Urban	Devonport-Takapuna Kaipatiki Whau Aert-Eden Orakei Maungakiekie-Tamaki Puketapapa
Outer Urban	Hibiscus and Bays Upper Harbour Henderson-Massey Papakura Howick Mangere-Otahuhu Otara-Papatoetoe Manurewa
Rural	Rodney Waitakere Ranges Franklin

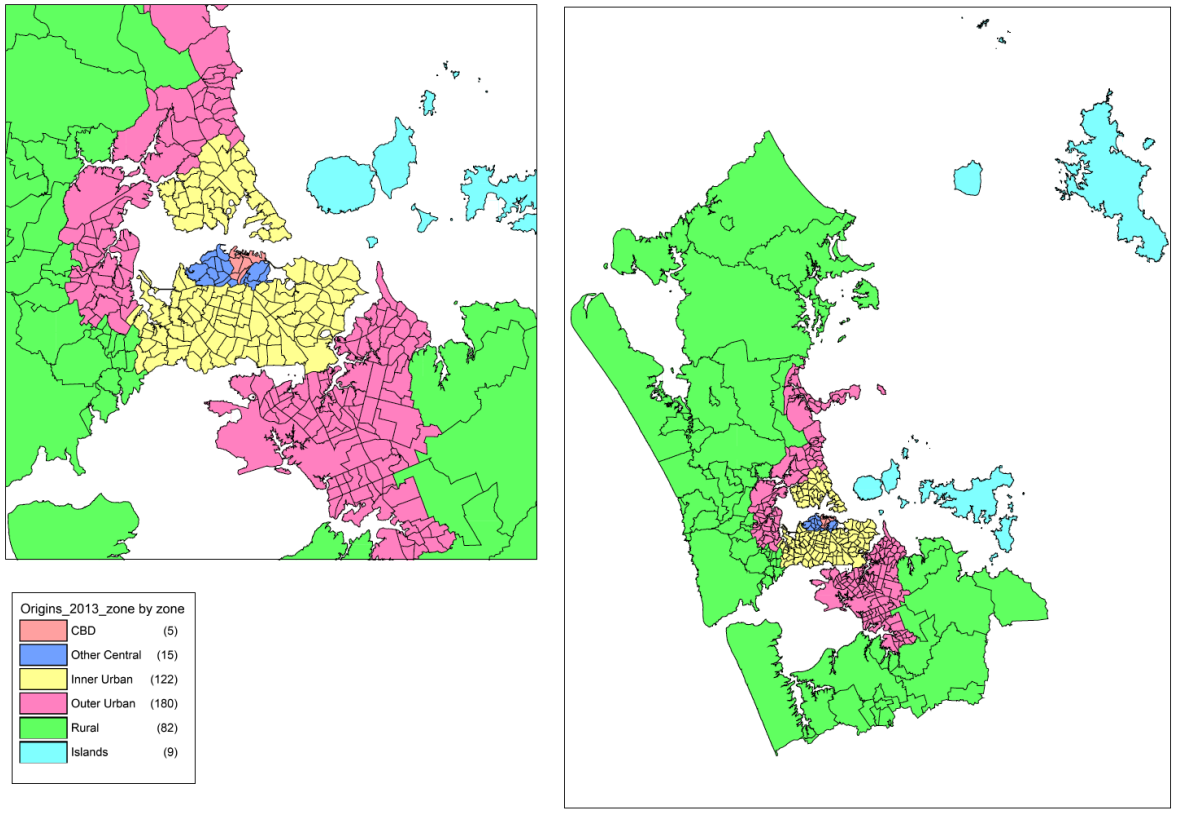


Figure 4.1
Definition of Auckland Sectors for Analysis

4.2 Overall Movement patterns

The overall numbers of commuting trips attracted to or generated by the defined sectors are set out in Table 4.2.

Table 4.2
Destinations and Origins for Auckland Commuting Trips 2013

Sector	Total by Destination		Total by Origin		Ratio of Resident Workers to Jobs
	No	Per cent	No	Per cent	
CBD	68,139	13.7%	12,351	2.5%	18%
Other Central	43,281	8.7%	21,777	4.4%	50%
Inner Urban	168,537	34.0%	188,337	38.0%	112%
Outer Urban	177,075	35.7%	210,078	42.3%	119%
Rural	39,078	7.9%	63,567	12.8%	163%
Total	**496,110**	**100.0%**	**496,110**	**100%**	**100%**

In terms of the destinations of commuting trips, the CBD accounts for about 14 per cent and with the Other Central sector, (essentially the CBD fringe and comprising the rest of the Waitemata Local Board area), attracts about 22 per cent of the total. The Inner Urban sector, the rest of the Auckland Isthmus plus the southern part of the North Shore, contains about 34 per cent of workplace destinations. The Outer Urban sector, which broadly forms a ring further out, contains slightly more with a share of 36 per cent. Workplaces in the rural areas in Rodney, Waitakere Ranges and Franklin account for about 8 per cent of the total, broadly equivalent to the Other Central area or about 60 per cent of the CBD. The Outer Urban and Rural areas combined therefore account for almost half the employment as measured by commuting in the Region.

In terms of the numbers of resident workers, the central sector (CBD plus Other Central) has a low proportion of the workforce with about 7 per cent of the total. Again the Outer sector has the highest proportion of the total and together with the Rural area contains the residential locations of over half the regional workforce.

The balance between commuting origins and destinations by sector is set out in Figure 4.2.

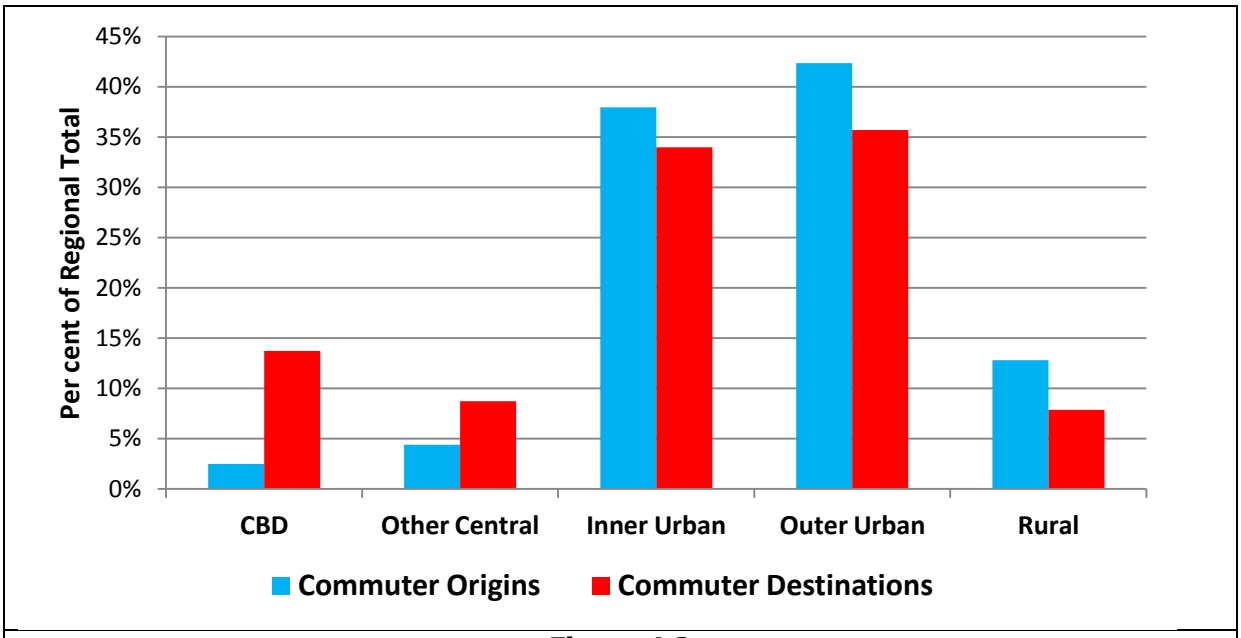


Figure 4.2
Origins and Destinations of Commuting Trips by Sector

The two central sectors have substantially more jobs than workers but for the other sectors the position is reversed with these having more workers than jobs. The difference is particularly pronounced for the Rural Sector.

4.3 Overall Comparison with Australian Cities

An indicative comparison is possible with the results for the four Australian cities of Sydney, Melbourne, Brisbane and Perth. For Auckland, the central sector (CBD plus Other Central) is broadly equivalent to the Inner sector defined for the Australian cities, the Auckland Inner Urban sector broadly equivalent to the Australian Middle sector and the Auckland Outer Urban and Rural sectors combined broadly equivalent to the Australian Outer sector. On this basis, the broad patterns of commuting origins and destinations in Auckland can be compared with those of the four Australian cities and the results are set out in Table 4.3.

Table 4.3
Trip Patterns by Sector in Australian Cities and Auckland

NZ Sector	Aust Equi-valent	Trips by Destination					Trips by Origin				
		Auck-land	Sydney	Mel-bourne	Brisbane	Perth	Auck-land	Sydney	Mel-bourne	Brisbane	Perth
Central (CBD+ Other Central)	Inner	**23%**	35%	28%	28%	38%	**7%**	17%	8%	5%	16%
Inner Urban	Middle	**34%**	28%	39%	46%	30%	**35%**	29%	47%	51%	31%
Outer Urban + Rural	Other	**43%**	38%	31%	27%	32%	**58%**	54%	42%	43%	53%

Note: Data for Australian cities is for 2006 and data for Auckland is for 2013

In general while there are differences in the geographical patterns of journey to work trips between the Australian cities, the position for Auckland is generally consistent with the balance of commuting in at least one of these cities and so provides a reasonable basis for further indicative comparison at this level.

4.4 Trip Patterns by Sector

4.4.1 Trip Patterns in 2013

The 2013 pattern of trip movements between the sectors in Auckland is set out in Table 4.4 and the shares of total trips in Table 4.5.

Table 4.4
Commuting Journeys by Sector 2013 : Total Trips

Origin	Destination					
	CBD	Other Central	Inner Urban	Outer Urban	Rural	Total
CBD	6,681	1,773	2,475	1,242	180	12,351
Other Central	6,318	8,001	4,782	2,346	330	21,777
Inner Urban	33,189	20,340	97,518	33,939	3,351	188,337
Outer Urban	17,775	10,281	52,026	122,808	7,188	210,078
Rural	4,176	2,886	11,736	16,740	28,029	63,567
Total	68,139	43,281	168,537	177,075	39,078	496,110

Table 4.5
Commuting Journeys by Sector 2013 : Shares of Total Trips

Origin	Destination					
	CBD	Other Central	Inner Urban	Outer Urban	Rural	Total
CBD	1.3%	0.4%	0.5%	0.3%	0.0%	2.5%
Other Central	1.3%	1.6%	1.0%	0.5%	0.1%	4.4%
Inner Urban	6.7%	4.1%	19.7%	6.8%	0.7%	38.0%
Outer Urban	3.6%	2.1%	10.5%	24.8%	1.4%	42.3%
Rural	0.8%	0.6%	2.4%	3.4%	5.6%	12.8%
Total	13.7%	8.7%	34.0%	35.7%	7.9%	100.0%
Per cent of jobs filled by resident workers	10%	18%	58%	69%	76%	53%

For the Region as a whole 53 per cent of workers have jobs within the sector in which they reside. The CBD has a very high share of workers from other areas, but this declines with distance from the centre. In the Outer Urban and Rural sectors, very high shares of jobs are filled by workers resident in the areas themselves (69 per cent and 76 per cent respectively).

The shares of total trips between each of the sectors is set out in Table 4.3. This shows reading from front to back the destinations of commuting trips from each of the sectors and from left to right the patterns of origins of trips to the destination sectors. Thus the CBD itself is the most important destination for trips from workers resident in the sector, but the largest source of workers for CBD workplaces is the Inner Urban sector.

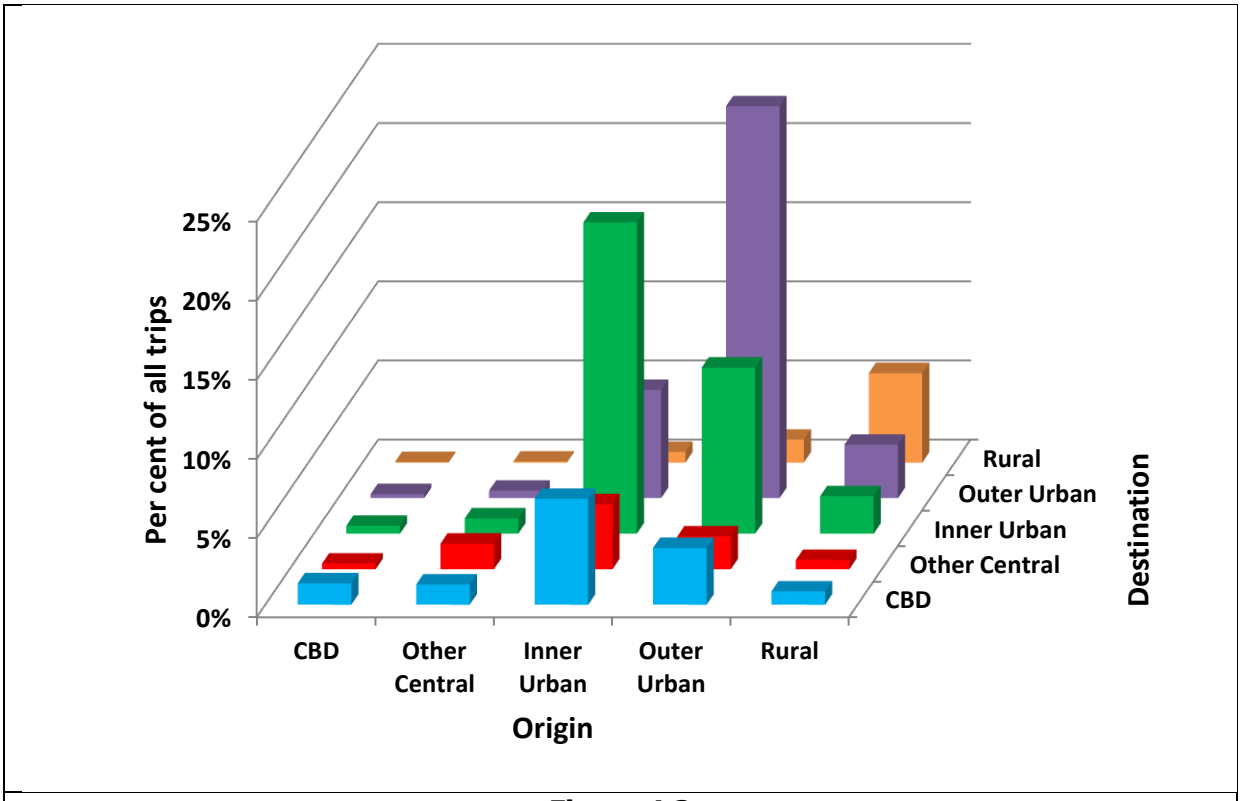


Figure 4.3
Commuting Journeys by Sector 2013 : Shares of Total Regional Trips

Figure 4.3 also highlights the large volumes of trips to and from the Inner Urban and Outer Urban areas.

The sources of the workers for each of the sectors are set out in Table 4.6.

Table 4.6
Commuting Journeys 2013 : Shares of Total Trips to Area by Sector

Origin	Destination					
	CBD	Other Central	Inner Urban	Outer Urban	Rural	Total
CBD	9.8%	4.1%	1.5%	0.7%	0.5%	2.5%
Other Central	9.3%	18.5%	2.8%	1.3%	0.8%	4.4%
Inner Urban	48.7%	47.0%	57.9%	19.2%	8.6%	38.0%
Outer Urban	26.1%	23.8%	30.9%	69.4%	18.4%	42.3%
Rural	6.1%	6.7%	7.0%	9.5%	71.7%	12.8%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

For the areas away from the centre, the Inner Urban, the Outer Urban and the Rural sectors, the majority of employment is filled by workers residing in the sector within which they live, emphasising the importance of internal transport linkages. However, the position is different in the central areas, CBD and Other Central sectors, with workers from outside filling 90 per cent of the jobs in the CBD and 80 per cent of those in the Other Central sector. Even if these two sectors are combined only 20 per cent of the total workplaces would be filled by those living in the area, with half coming from the Inner Urban and 30 per cent from the Outer Urban and Rural sectors.

This high share of workers coming into the central areas from the Inner Urban and Outer Urban sectors demonstrates the importance of the transport links providing access.

Commuting flows have also been categorised by direction and the results are set out in Table 4.7.

Table 4.7
Commuting Flows by Direction 2013

Direction of Commuting	Percentage of Total
Within area	53%
Inwards	35%
Outwards	12%

Overall, over 50 per cent of workers have employment within the sector in which they reside, 35 per cent commute in an inwards direction and just over 10 per cent commute outwards. The numbers commuting in an inward direction are typically the ones which place the most pressure on the key elements of the transport network.

Looking at the position on a spatial basis, about 56 per cent of commuting journeys have an origin or destination in the central and inner areas and 22 per cent in the central area on its own. It is these journeys which would be most affected by congestion in the city.

This pattern of commuting can be compared with that of the four Australian cities and this is set out in Figure 4.4.

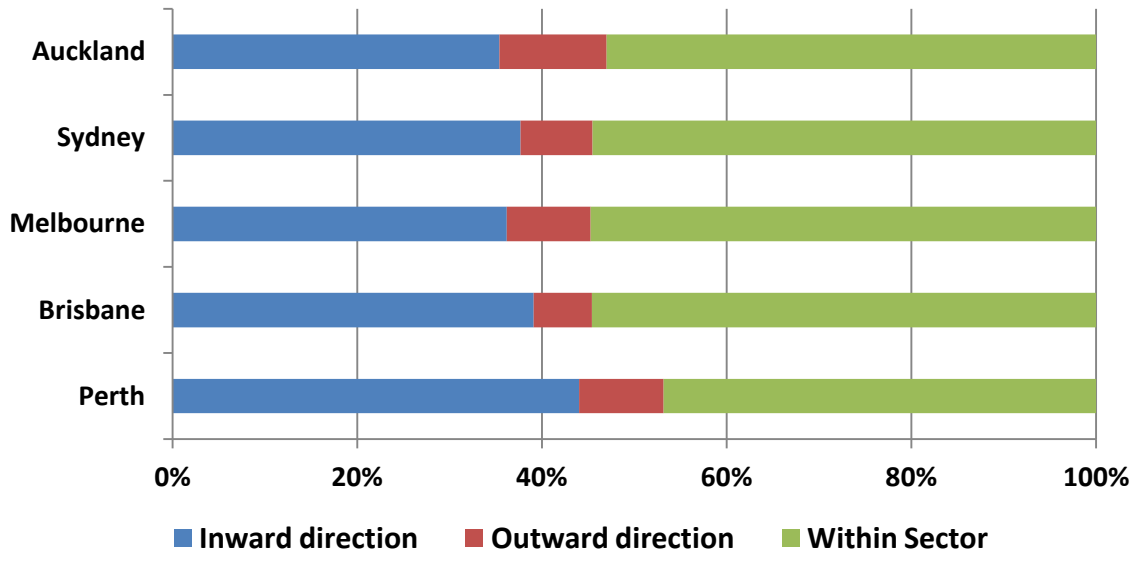


Figure 4.4
Commuting Flows by Direction Auckland and Australian Cities

Compared to the three Australian cities excluding Perth, Auckland has a similar share of commuting within each sector. For movements crossing sector boundaries, Auckland has a higher share of outbound movements, which represent 12 per cent of commuting flows compared to between 6 and 9 per cent for the Australian cities. The share of inward commuting in Auckland is less than that in the Australian cities, slightly less than in Sydney and Melbourne and more significantly lower than that in Brisbane or Perth.

4.4.2 Changes in Commuting Patterns

The pattern of growth of movements between the sectors in Auckland between 2006 and 2013 is set out in terms of the total change in numbers in Table 4.8 and in terms of percentages changes in Table 4.9. Further analysis by mode is set out in Section 4.7.

Table 4.8
Changes in Commuting Trips by Sector 2006-2013

Sector		Destination					
		CBD	**Other Central**	**Inner Urban**	**Outer Urban**	**Rural**	**Total Change**
Origin	CBD	2,466	609	1,164	603	93	4,935
	Other Central	75	861	486	432	63	1,917
	Inner Urban	1,845	996	1,068	4,671	975	9,555
	Outer Urban	2,724	1,515	1,956	9,810	1,722	17,727
	Rural	633	483	1,119	2,931	1,794	6,960
	Total	7,743	4,464	5,793	18,447	4,647	41,094

Table 4.9
Change in Commuting Flows 2006-2013 by Origin
(Percentage Increase on 2006 flows for each Sector-Sector Movement)

Sector		Destination						
		CBD	**Other Central**	**Inner Urban**	**Outer Urban**	**Rural**	**Total Increase from 2006 by Origin (%)**	**Share of Total by Origin**
Origin	CBD	59%	52%	89%	94%	107%	**67%**	12%
	Other Central	1%	12%	11%	23%	24%	**10%**	5%
	Inner Urban	6%	5%	1%	16%	41%	**5%**	23%
	Outer Urban	18%	17%	4%	9%	32%	**9%**	43%
	Rural	18%	20%	11%	21%	7%	**12%**	17%
	Total increase from 2006 by destination	**13%**	**12%**	**4%**	**12%**	**13%**	**9%**	**100%**
	Share of total by destination	19%	11%	14%	45%	11%	100%	

The key highlights from this table include:-

- The large percentage growth (67 per cent) for trips by workers resident in the CBD. About half the growth reflects short-distance commuting to jobs also in the CBD, but there has also been substantial percentage growth for commuting to all other sectors across the Region (although some movements are off a small base with, for example, the 100 per cent increase to the Rural sector being represented by less than 100 extra trips).

- The high percentage growth in the number of trips to the Outer Urban area from all the other sectors. The growth in commuting trips to employment in the Outer Urban sector accounted for about 45 per cent of all growth over the period.

- The low growth in commuter trips both to and from the Inner Urban area, with the numbers increasing by about 4 to 5 per cent. The growth of commuting within the area was also very small at just 1 per cent.

- Despite a considerable increase in the numbers of jobs, the low growth in the number of trips from the Other Central sector into the CBD with an increase of just 1 per cent over 2006 – 2013 (75 trips).

On a Region-wide basis the main growth in the origins and destinations of commuting trips has been away from the city centre in the Outer Urban sector, which has attracted trips from all other parts of the city.

The changes in the patterns of commuting to each of the sectors are set out in Table 4.10. This shows the shares by origin sector in the growth of trips to each area.

Table 4.10
Changes in Commuting Journeys 2006-2013 by Destination :
Shares of Growth of Total Trips by Origin Sector

Sector		Destination					
		CBD	Other Central	Inner Urban	Outer Urban	Rural	Total Change
Origin	CBD	32%	14%	20%	3%	2%	12%
	Other Central	1%	19%	8%	2%	1%	5%
	Inner Urban	24%	22%	18%	25%	21%	23%
	Outer Urban	35%	34%	34%	53%	37%	43%
	Rural	8%	11%	19%	16%	39%	17%
	Total	100%	100%	100%	100%	100%	100%

The growth in comuting to the CBD has been met both by growth in short-distance commuting from the CBD itself (32 per cent) and also from longer journeys from the Outer Urban sector which have provided the largest component of growth, about 35 per cent of the total. Very little of the growth in CBD employment has been met by workers from the immediately adjacent Other Central sector and growth from the Inner Urban sector has been limited.

The changes in the broad trends of commuting over the period from 2001 are set out in Table 4.11 and Figure 4.5.

Table 4.11
Changes in Commuting Flows by Direction 2001-2013

Direction of Commuting	Percentage of Total			Growth in Total Trips 2001-2013
	2001	2006	2013	
Within area	54.2%	54.3%	53.0%	28%
Inwards	36.3%	35.4%	35.4%	27%
Outwards	9.5%	10.3%	11.6%	60%

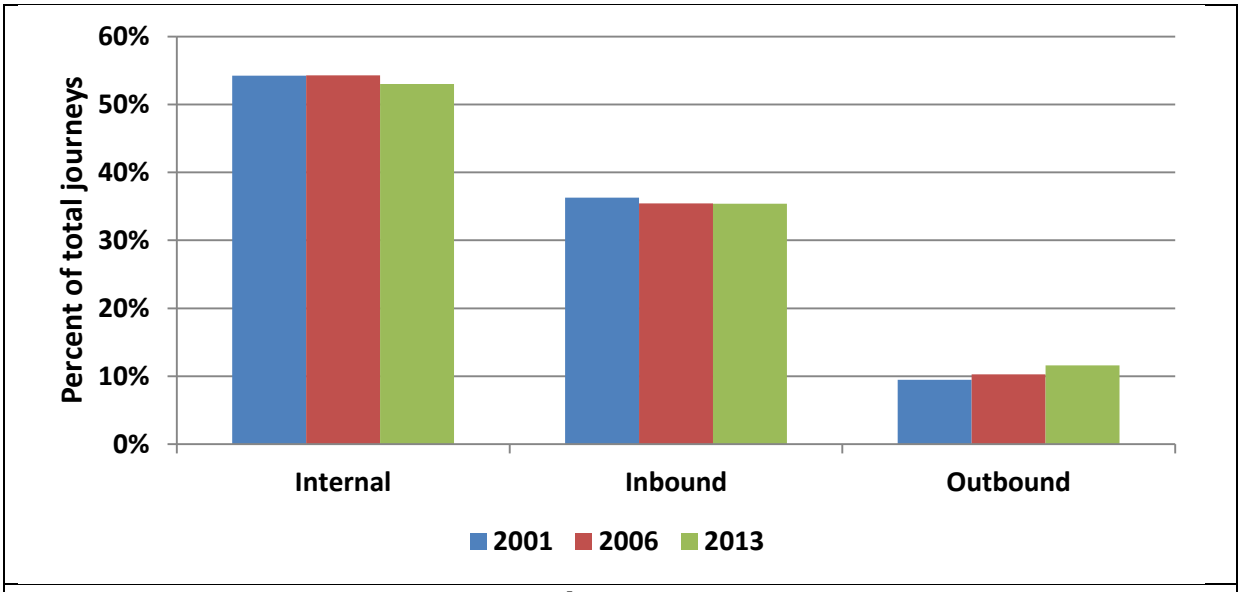


Figure 4.5
Changes in Commuting Flows by Direction 2001-2013

Between 2001 and 2013 the percentage share of outbound trips has increased steadily, reflecting in part a reduced share of inbound trips between 2001 and 2006 and a reduced share of journeys internal to each of the sectors between 2006 and 2013. Over the period the number of outbound journeys has increased by 60 per cent, compared to a growth of 27 to 28 per cent for inward and internal movements. In part the rapid growth of the resident workforce in the CBD, only a portion of whom work in the area, will have contributed to the growth in outbound movements.

The shares of trips by workplace sector over the same period from 2001 are set out in Figure 4.6.

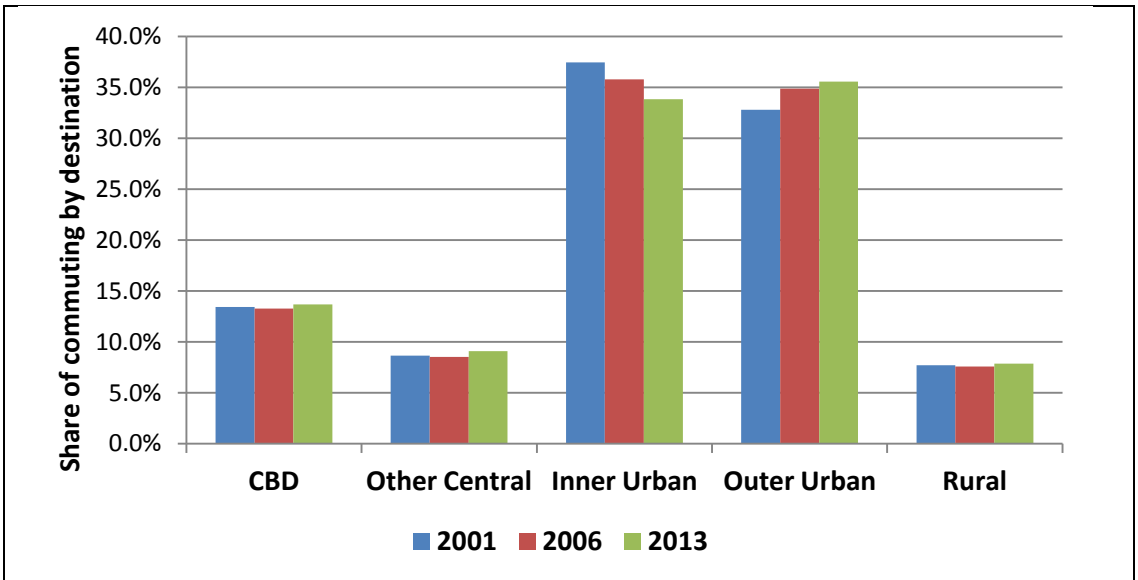


Figure 4.6
Shares of Commuting Trip Destinations by Sector 2001-2013

As a share of the total, between 2001 and 2013 employment as represented by commuting destinations has increased steadily in the Outer Urban sector, a probable contributor to the increase in outbound journeys to work, and has fallen consistently in the Inner Urban sector. In the CBD, Other Central and Rural sectors the overall share in 2013 is similar to that in 2001 with a small decline to 2006 and a subsequent increase to 2013.

These changes in shares however need to be considered against the growth of commuting generally and the total flows by workplace sector are set out in Figure 4.7.

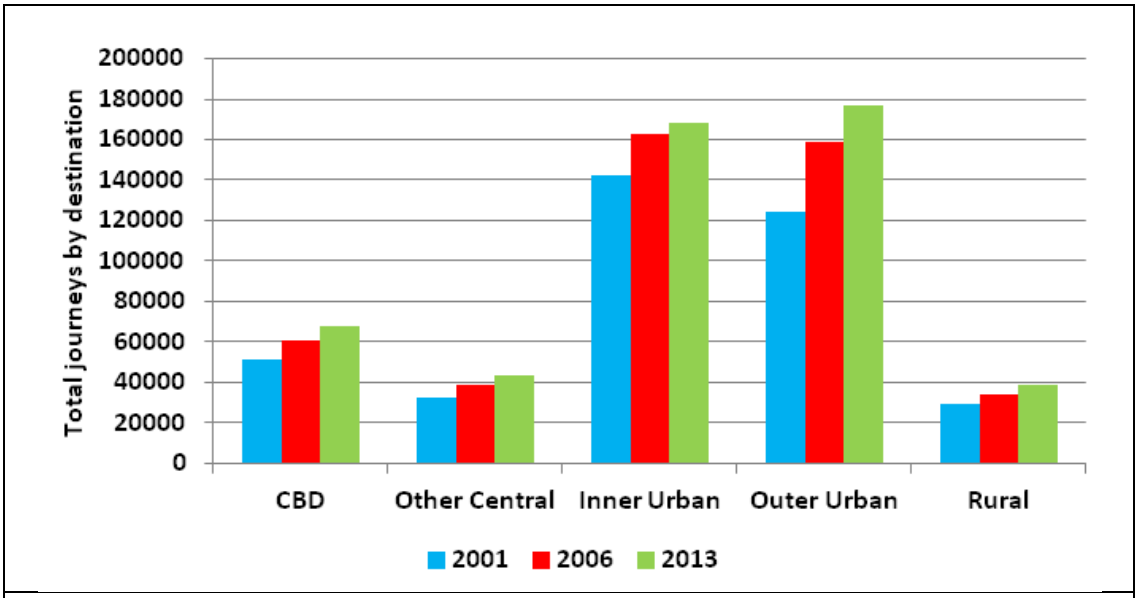


Figure 4.7
Total Commuting Trip Destinations by Sector 2001-2013

For all the sectors commuting increased between 2001 and 2013. Although the share of the Inner Urban sector fell over the period, there was an increase in employment as measured by commuting of about 26,000. Growth was also rapid in the Outer Urban sector where employment in the area increased by over 50,000 over the period and in the rural Rural area increased by some 10,000. To put this outer area growth into context, the increase in employment between 2001 and 2013 was over 90 per cent of the total employment in the CBD in 2013.

4.5 Modes used by Workplace Sector

The modes used by workplace sector in 2013 are set out in Table 4.12 and Figure 4.8.

Table 4.12
Modes Used by Workplace Sector 2013

	CBD	Other Central	Inner Urban	Outer Urban	Rural	Total
Summary by Destination : Trip Numbers						
Private vehicle	37,149	30,861	131,691	146,358	26,190	372,249
Bus	14,166	3,711	7,140	3,993	594	29,604
Train	4,041	1,101	1,746	1,320	180	8,388
Walked/jogged	6,948	2,931	6,483	4,929	1,494	22,785
Bicycle	1,185	843	1,806	1,440	258	5,532
Other	3,447	1,443	4,827	5,253	1,275	16,245
Worked at home	1,203	2,391	14,844	13,782	9,087	41,307
Total	**68,139**	**43,281**	**168,537**	**177,075**	**39,078**	**496,110**
Summary by Destination : Per cent of total						
Private vehicle	55%	71%	78%	83%	67%	75%
Bus	21%	9%	4%	2%	2%	6%
Train	6%	3%	1%	1%	0%	2%
Walked/jogged	10%	7%	4%	3%	4%	5%
Bicycle	2%	2%	1%	1%	1%	1%
Other	5%	3%	3%	3%	3%	3%
Worked at home	2%	6%	9%	8%	23%	8%
Total	100%	100%	100%	100%	100%	100%

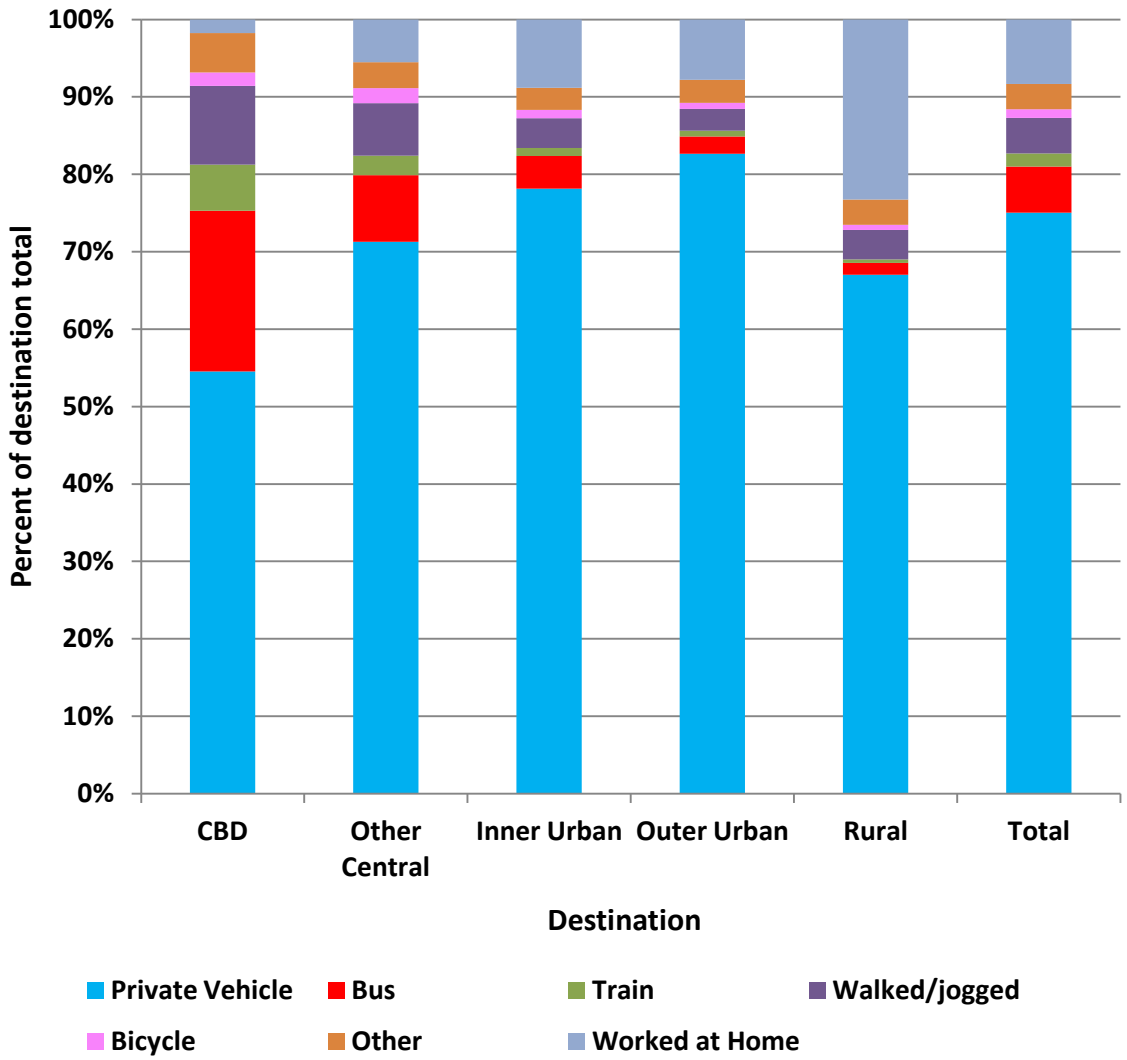


Figure 4.8
Modal Shares by Destination Sector 2013

The key highlights from these tables and figure include:-

- The mode share of private transport for all commuting trips with a destination in the CBD, including trips from within the CBD itself, is 55 per cent. This increases with distance away from the central area with the mode share for private vehicles reaching 83 per cent for commuting to jobs in the Outer Urban sector. However, this share falls to 67 per cent for jobs in the Rural sector reflecting the relatively high share of work at home trips in this area.

- The mode share for public transport use for trips terminating in the CBD amounts to 27 per cent and this share falls with increasing distance from the CBD amounting to only 2 to 3 per cent for trips terminating in the Outer Urban and Rural sectors. For the CBD, bus accounts for about 21 per cent of trips and rail for 6 per cent.

- Journeys by active modes (walking and cycling) account for 12 per cent of trips terminating in the CBD with walking accounting for about 10 per cent of the total and cycling about 2 per cent. Both these mode shares decline with distance from the central area, although there is a slight increase in the share of walking trips in the Rural sector.

- The share of work at home generally increases with distance away from the central area and, as discussed earlier, is particularly high in the Rural sector where it reaches about 24 per cent of terminating trips.

The contribution that trip making to the central areas makes to the total use of modes by workers is set out in Table 4.13.

Table 4.13
Commuting to Central Areas as a Share of Total Flows by Mode 2013

Mode	CBD	Other Central	Total Central
Private vehicle	10%	8%	18%
Bus	48%	13%	60%
Train	48%	13%	61%
Total PT	*48%*	*13%*	*61%*
Walked/jogged	30%	13%	43%
Bicycle	21%	15%	37%
Other	21%	9%	30%
Worked at home	3%	6%	9%
Total	14%	9%	23%

Overall trip making to the central areas accounts for about 60 per cent of all commuting journeys by public transport, interestingly with bus and train having similar shares. Trips to the CBD itself account for about 80 per cent of these with the shares to the Other central sector being much lower. Trip making to the central area also accounts for 43 per cent of all walking trips and a similar share 37 per cent of cycling trips but only 18 per cent of private vehicle trips.

4.6 Modes Used by Residential Sector

The pattern of trip making by sector of residence is set out in Table 4.14 and Figure 4.9.

Table 4.14
Trip Making by Origin Sector 2013

Origin Sector	Private Vehicle	Bus	Train	Walk	Bicycle	Other	Work at Home	Total
Total Trips by Origin								
CBD	3,081	1,827	288	5,952	111	399	693	12,351
Other Central	12,216	2,316	168	3,633	615	648	2,181	21,777
Inner Urban	137,082	16,149	3,621	6,984	2,970	6,564	14,967	188,337
Outer Urban	171,246	8,433	3,204	4,770	1,527	6,810	14,088	210,078
Rural	48,624	879	1,107	1,446	309	1,824	9,378	63,567
Total	372,249	29,604	8,388	22,785	5,532	16,245	41,307	496,110
Total Trips by Origin (Per cent of total)								
CBD	25%	15%	2%	48%	1%	3%	6%	100%
Other Central	56%	11%	1%	17%	3%	3%	10%	100%
Inner Urban	73%	9%	2%	4%	2%	3%	8%	100%
Outer Urban	82%	4%	2%	2%	1%	3%	7%	100%
Rural	76%	1%	2%	2%	0%	3%	15%	100%
Total	75%	6%	2%	5%	1%	3%	8%	100%

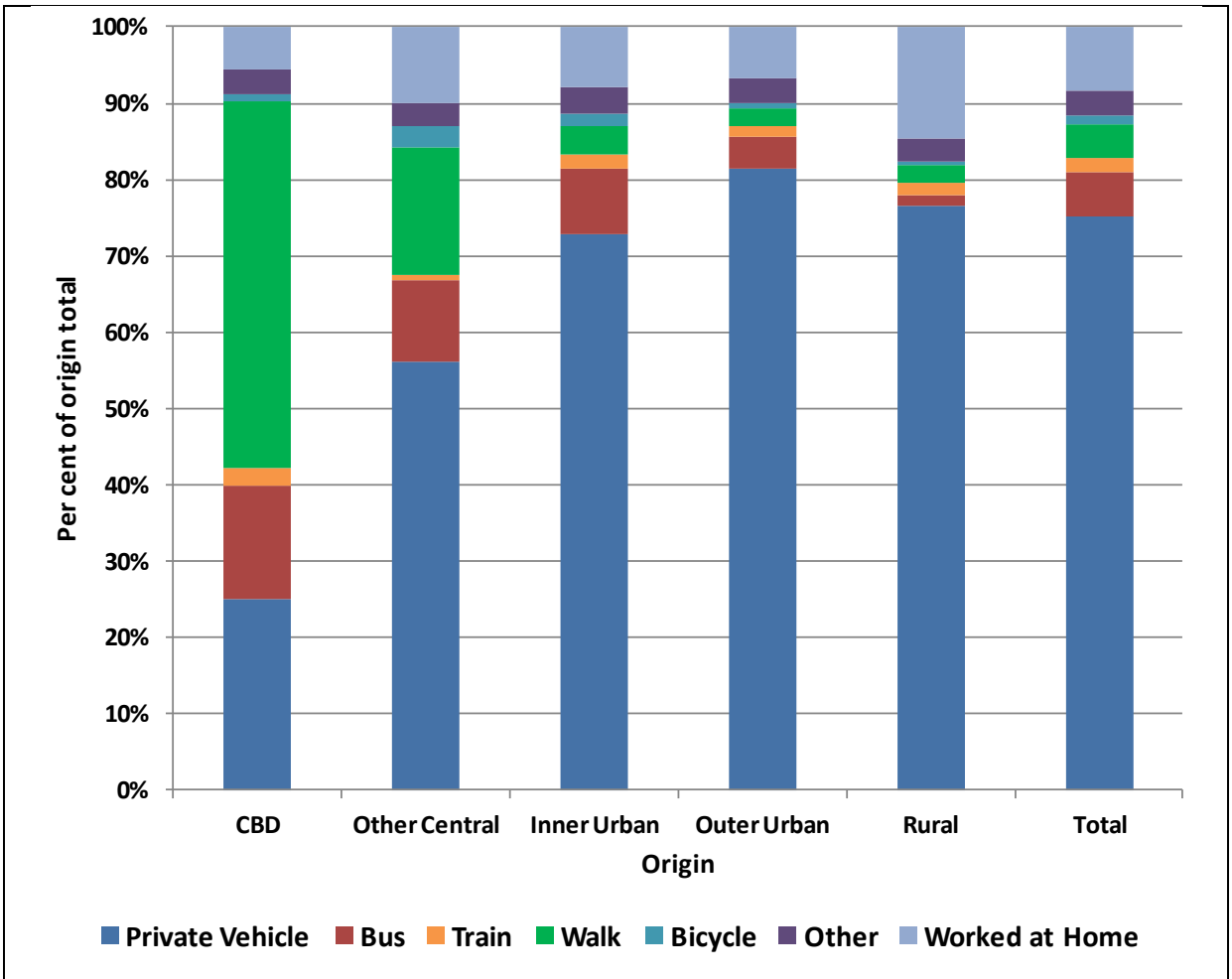


Figure 4.9
Modal Share by Sector of Residence

Considering the patterns of commuting by residential location, the key highlights which emerge include:-

- For workers resident in the CBD, walking is the most popular mode accounting for almost half the commuting trips made. Private vehicles account for about 25 per cent and bus for about 15 per cent. 8 per cent work at home.

- With increasing distance away from the CBD up to the Outer Urban sector, the share of private vehicles increases, amounting to 56 per cent in the Other central sector, 73 per cent in the Inner Urban sector and 82 per cent in the Outer Urban sector. This share is slightly lower in the Rural sector reflecting the high share of workers working at home.

- The shares of bus, walk and cycle trips decline with increasing distance from the CBD, with bus for example falling from 11 per cent in the Other Central sector to 1 per cent in the Rural sector. Walking trips fall from 17 per cent to 2 per cent. Bicycle trips also decline but are relatively small.

- The share of rail is small remaining at 2 per cent of trips except for the Other Central sector where it falls to 1 per cent. In the Rural sector more people use rail for their journey to work than bus, although the numbers of both are small.

The comparison with the position for Australia is set out in Figure 4.10.

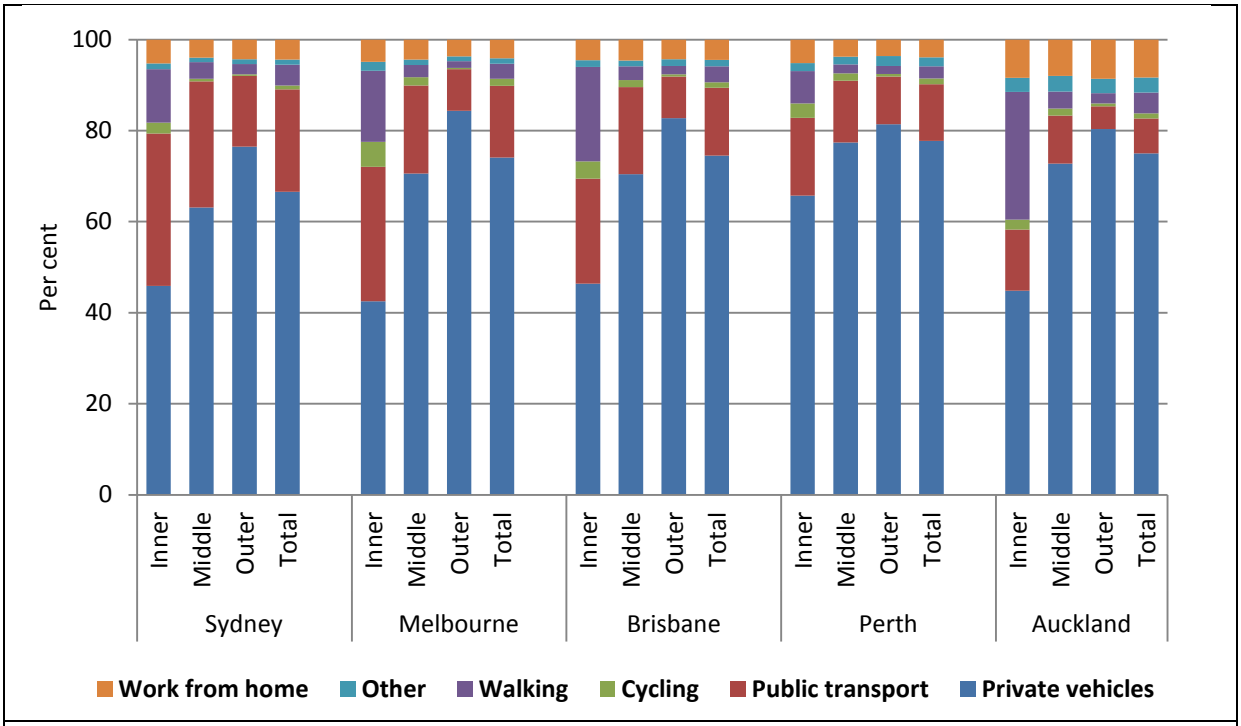


Figure 4.10
Transport Mode Share for Travel to Work, Auckland 2013 and Australian Cities 2006 by Sector of Residence

For the Inner Area (the CBD and the Other Central sector) Auckland has a broadly similar share of private car travel, but has a relatively low public transport share of 13 per cent compared to between 17 and 34 per cent for the Australian cities. This difference probably reflects the high share of walking for Auckland and also the numbers working at home. For the other sectors for Auckland the public transport shares were relatively low. The Auckland work at home share was also high for all the areas considered.

Not surprisingly, Auckland and the four Australian cities share similar patterns of increasing private vehicle travel from residential areas further away from the CBD. The proportions of private vehicle travel from the Inner, Middle and Outer areas are similar to those for Melbourne and Brisbane, but lower than for Perth. Auckland's share of private vehicle travel from Middle and Outer areas is higher than Sydney's, although the shares for the Inner areas are similar.

4.7 Changes over Time

The changes in transport mode share in percentage points between 2006 and 2013 for each of the different areas are set out in Table 4.15.

Table 4.15
Changes in Modal Shares 2006-2013
(Percentage Points) (1)

	Private Vehicle	Bus	Train	Walk	Bicycle	Other	WAH	Total
By Origin								
CBD	-5.8%	4.0%	1.6%	1.5%	0.2%	-0.7%	-0.9%	0.0%
Other Central	-3.5%	1.4%	0.5%	0.4%	1.0%	-0.9%	1.3%	0.0%
Inner Urban	-1.3%	0.9%	0.8%	-0.2%	0.3%	-0.7%	0.2%	0.0%
Outer Urban	-0.4%	0.5%	0.5%	-0.2%	0.1%	-0.6%	0.2%	0.0%
Rural	0.7%	0.2%	0.7%	-0.4%	0.0%	-0.4%	-0.7%	0.0%
Total	-1.2%	0.7%	0.6%	0.2%	0.2%	-0.7%	0.1%	0.0%
By Destination								
CBD	-4.7%	1.1%	1.8%	2.0%	0.4%	-1.0%	0.5%	0.0%
Other Central	-4.6%	1.7%	1.0%	0.8%	0.5%	-0.3%	0.8%	0.0%
Inner Urban	-1.0%	0.6%	0.5%	0.0%	0.1%	-0.6%	0.4%	0.0%
Outer Urban	0.3%	0.3%	0.3%	-0.2%	0.1%	-0.7%	0.0%	0.0%
Rural	2.3%	0.7%	0.2%	-0.7%	0.1%	-0.8%	-1.8%	0.0%
Total	-1.2%	0.7%	0.6%	0.2%	0.2%	-0.7%	0.1%	0.0%

Notes (1) The change in percentage points is the difference in the percentage modal share (i.e. an increase from 70 per cent to 75 per cent would be recorded as 5 percentage points).

The main points emerging include:-

- There has been a decline in the private vehicle share for almost all movements from the sectors, but some increase in the share for trips to the Outer Urban and Rural sectors.
- The bus and train modal shares have increased for movements to and from all areas. Increases in the bus shares have been particularly large for trips to and from the central areas and have typically declined with distance away.
- For rail, while the increase in modal share has declined for destinations away from the central area, for residential areas the position is more variable with relatively large increases for trips from the Rural sector.
- The share of walking trips has fallen for trips from sectors away from the centre.

- The share of cycling trips has increased for all movements identified, but the changes are relatively small.

- The share of work at home trips has decreased in the rural sector, but has generally increased elsewhere except for trips from the CBD.

These changes in shares can also be compared against the changes in the total numbers of trips as set out in Table 4.16.

Table 4.16
Changes in Commuting Trips by Mode 2006-2013

	Private Vehicle	Bus	Train	Walk	Bicycle	Other	WAH	Total
By Origin								
CBD	804	1,029	234	2,490	57	111	210	4,935
Other Central	372	474	114	393	246	-126	444	1,917
Inner Urban	4,689	2,373	1,611	30	651	-939	1,140	9,555
Outer Urban	13,659	1,713	1,200	-57	300	-627	1,539	17,727
Rural	5,724	186	492	-66	57	-42	609	6,960
Total	25,248	5,775	3,651	2,790	1,311	-1,623	3,942	41,094
By Destination								
CBD	1,356	2,250	1,560	1,983	372	-198	420	7,743
Other Central	1,395	1,053	501	597	300	48	570	4,464
Inner Urban	2,874	1,236	948	150	300	-813	1,098	5,793
Outer Urban	15,729	933	549	132	270	-549	1,383	18,447
Rural	3,894	303	93	-72	69	-111	471	4,647
Total	**25,248**	**5,775**	**3,651**	**2,790**	**1,311**	**-1,623**	**3,942**	**41,094**

Because of the overall growth in commuting trips, although the share of private vehicle trips has declined for almost all the movements in Table 4.15, the total numbers of these trips have increased for all movements. In general, with the exception of walking trips in the Outer Urban and Rural sectors, the numbers of trips for all the movements with identified modes (i.e. excluding Other trips) have increased. The shares of the increases by mode for workplace destinations (excluding Other trips) is set out in Figure 4.11.

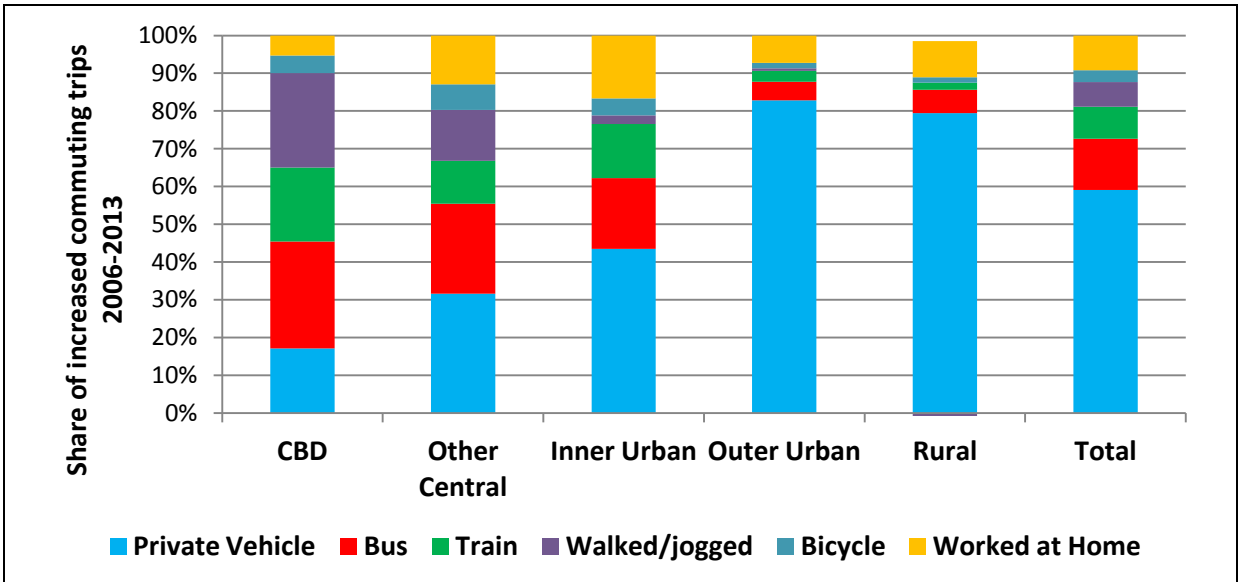


Figure 4.11
Shares of Modes in Changes in Trip Making by Workplace 2006-2013

The main points from this figure include:-

- The share of private vehicle trips in the total increase for the CBD is relatively low but this increases with distance away from the centre and represents 80 per cent or more for the Outer Urban and Rural sectors.

- Public transport modes make a significant contribution to the growth in trips to the CBD, Other Central and Inner Urban sectors but little to the Outer Urban and Rural sectors.

- Active modes make a significant contribution to growth in commuting to the CBD and the Other central sector but little elsewhere.

Table 4.17
Breakdown by Area of Changes in Commuting by Mode 2006-2013

Sector	Mode							
	Private Vehicle	**Bus**	**Train**	**Walk**	**Bicycle**	**Other**	**WAH**	**Total**
Origin of Increased Commuting Movements								
CBD	3%	18%	6%	89%	4%	-7%	5%	12%
Other Central	1%	8%	3%	14%	19%	8%	11%	5%
Inner Urban	19%	41%	44%	1%	50%	58%	29%	23%
Outer Urban	54%	30%	33%	-2%	23%	39%	39%	43%
Rural	23%	3%	13%	-2%	4%	3%	15%	17%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Destination of Increased Commuting Movements								
CBD	5%	39%	43%	71%	28%	12%	11%	19%
Other Central	6%	18%	14%	21%	23%	-3%	14%	11%
Inner Urban	11%	21%	26%	5%	23%	50%	28%	14%
Outer Urban	62%	16%	15%	5%	21%	34%	35%	45%
Rural	15%	5%	3%	-3%	5%	7%	12%	11%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Table 4.17 looks at change on a modal basis, particularly the origins and destinations of the increased commuting trips that occurred on each mode. The main points from this table include:-

- The increase in walking trips came almost entirely from the CBD, with the remainder from the Other Central area.

- Around 40-50 per cent of new bus, train and bicycle commuting trips came from the Inner Urban area, although this area was the source of only 23 per cent of all new commuting trips.

- 57 per cent of all new bus and rail trips went into the central areas, showing the continued dominance of this area as a destination for public transport. 20-25 per cent went to the Inner Urban area.

- Over half the increase in private vehicle commuting came from the Outer Urban area, while the only 4 per cent of the increase came from the central areas

- The bulk of new private vehicle trips went to destinations in the Outer Urban area.

4.8 Average Trip Lengths

The average trip lengths by the main mode recorded in the Census are set out in Table 4.8[4]. These are calculated based on the distances using the road network between CAU centres[5].

Table 4.8
Average Trip Lengths by Main Mode

Mode	Average Trip Length (kms)
Private vehicle	13.5
Bus	11.4
Train	15.9
Public transport	12.4
Active modes	6.7
Average all modes	**11.8**

The average travel distance in 2013 was estimated to be about 12 kms. Trips with train as the main mode (which would often include part of the journey by another mode accessing the rail services) have the highest average journey distance reflecting the advantage of rail for longer journeys and this is about 40 per cent longer than that for bus travel, and about 18 per cent longer than that for private vehicle users. The average distance for active mode users is about 55 per cent of the overall average.

The distribution of average trip lengths by place of work and residence sector is set out in Table 4.9.

Table 4.9
Trip Lengths by Sector 2013 (kms)

Sector	By Place of Work		By Place of Residence	
	Average Distance (kms)	Per cent of Average	Average Distance (kms)	Per cent of Average
CBD	12.1	103%	5.1	43%
Other Central	11.2	95%	6.1	52%
Inner Urban	10.8	92%	9.2	78%
Outer Urban	12.4	105%	13.1	111%
Rural	13.4	114%	18.9	160%
Total	**11.8**	**100%**	**11.8**	**100%**

By place of work the trip lengths are broadly similar, with the distance for the CBD being slightly higher than that for the Other Central sector which in turn is higher than that for the Inner Urban sector. Average distances then increase for jobs in the Outer Urban and Rural sectors.

By residential areas, average trip lengths increase steadily from the central area and those for the rural areas are almost 4 times as long as those for the CBD.

[4] It should be noted that the journey distances relate to the total journey where as the mode recorded may only cover part of this journey.

[5] The road transport distances were determined though application of ESRI Network Analyst Geographical Information System (GIS) software as was used in the development of the Market Economics New Zealand Freight Flows Model. These give distances between the centroids of the CAUs rather than being based on the journey distances for individual house to place of work movements.

The changes in average trip lengths by mode between 2006 and 2013 are set out in Figure 4.12

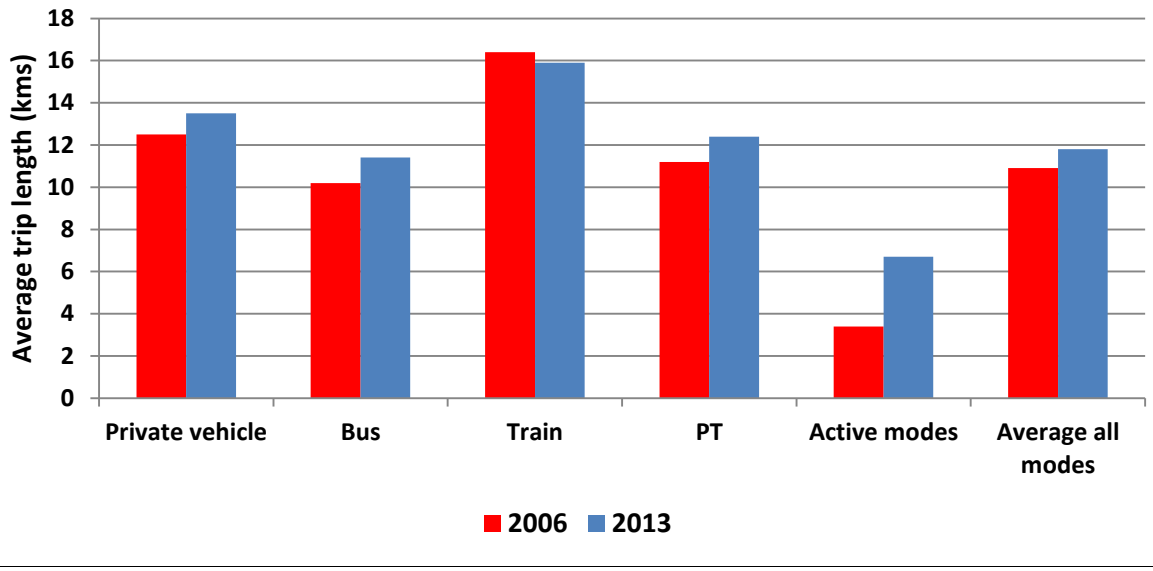


Figure 4.12
Changes in Trip Length by Main Mode 2006-2013

In general average trip lengths have increased. The exception to this is for train where distances have declined slightly. Here the improvements to services since 2006 seem to have had a greater impact on those making relatively short trips and, as indicated in Table 4.15, there has been relatively strong growth in patronage within the central and inner areas, where trips are relatively small.

The changes in average trip distance by workplace and residence sector are set out in Figure 4.13 and Figure 4.14 and in Table 4.20 .

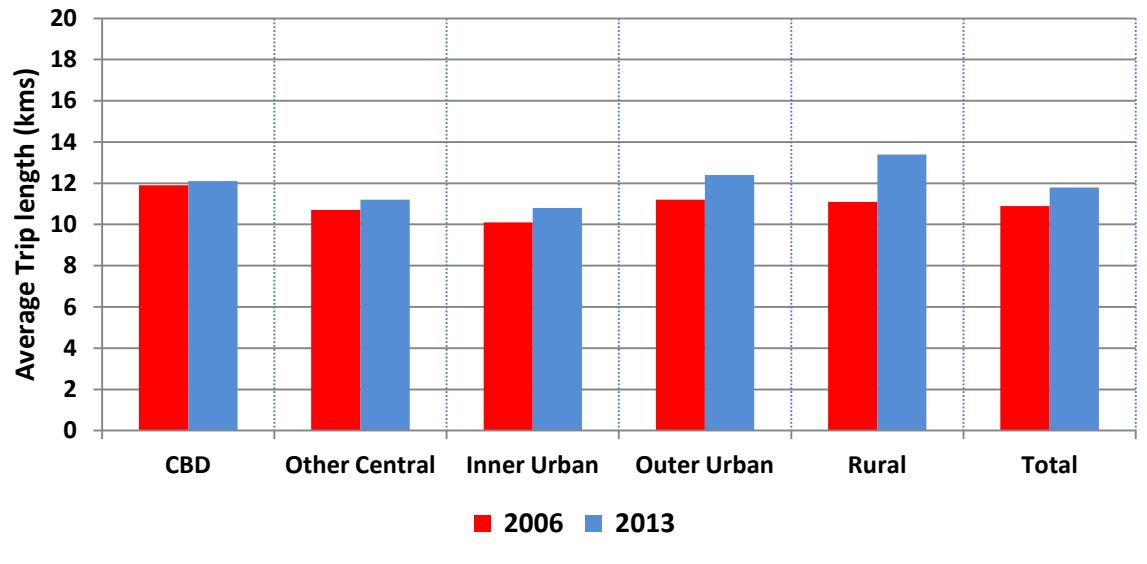


Figure 4.13
Average Trip Length by Workplace 2006 and 2013

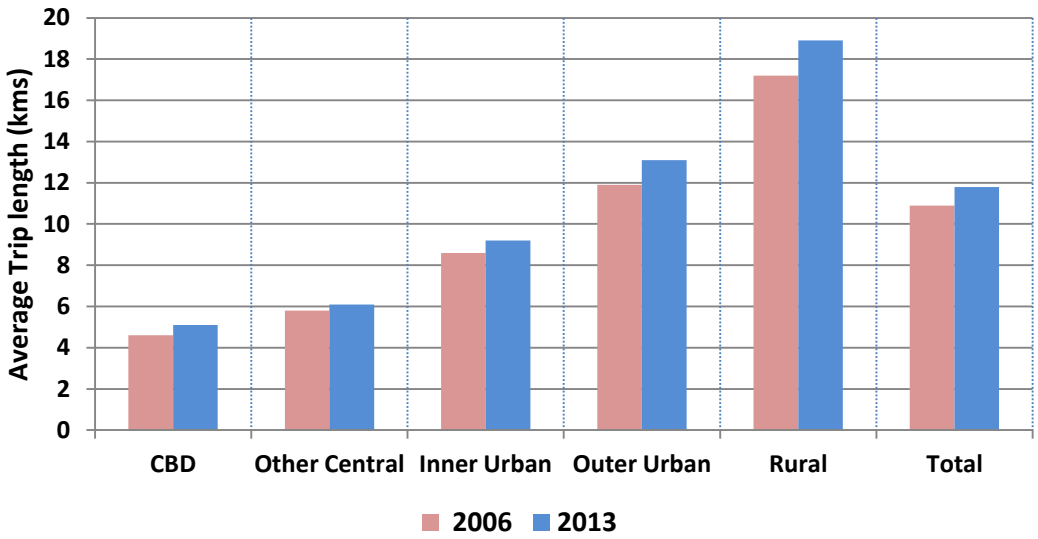


Figure 4.14
Average Trip Length by Residence 2006 and 2013

Table 4.20
Average Trip length by Workplace and Residence 2006 and 2013

Sector	By Place of Work		By Residence	
	Average Distance (kms) 2006	Average Distance (kms) 2013	Average Distance (kms) 2006	Average Distance (kms) 2013
CBD	11.9	12.1	4.6	5.1
Other Central	10.7	11.2	5.8	6.1
Inner Urban	10.1	10.8	8.6	9.2
Outer Urban	11.2	12.4	11.9	13.1
Rural	11.1	13.4	17.2	18.9
Total	**10.9**	**11.8**	**10.9**	**11.8**

For all sectors, both residential and workplace average trip lengths increased, with the changes typically getting greater as the distance from the central area increases.

For the CBD, the distances for workers in the area only changed very slightly between 2006 and 2013, with the low growth reflecting in part the increases in the numbers both living and working in the area. There was, however, a larger increase in the length of journeys for those living in the area, reflecting the increased commuting.

Some comparison is possible with the position in the Australian cities and this is set out in Figure 4.15. It should be noted however that the distances are calculated differently with the Australian figures being based on straight line distances and the Auckland ones being based on the distance by the road network, which typically would give longer journeys.

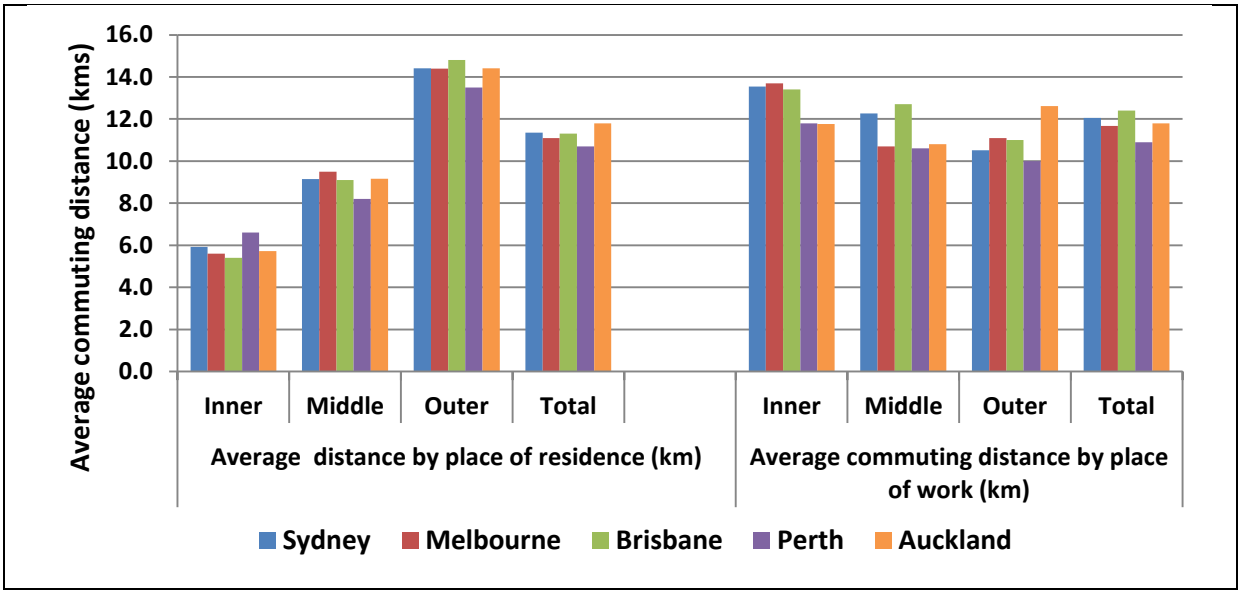


Figure 4.15
Commuting Distances in Auckland and in Australian Cities

The figure shows that as measured, the average distances by sector of residence in Auckland are broadly similar to those estimated for the Australian cities, and in practice are probably lower, given the differences in the methods used to estimate the totals. However when considered by place or work, Auckland typically has low average commuting distances for the Inner and Middle sectors but higher distances for places of work in the Outer sector, possibly reflecting the very substantial rural areas included in the Region.

While Australian cities' travel distances are measured using straight lines, Auckland's travel distances are measured via the road network. Overall, the different approach to calculation suggests that while the reported figures are similar, travel distances in Auckland may be somewhat below those in Australia but the differences are likely to be only small.

Looking at the overall patterns, Auckland has a similar pattern of trip distance increasing from residential areas further away from the CBD. There appears to be more variance by trip destination, with trips to the inner areas of Sydney, Melbourne and Brisbane being considerably longer than those for destinations in the outer areas and higher than the average. Auckland has a different pattern with the longest trips going to the outer area, while trips to the inner area are consistent with the average, which is reflected in part by the relatively high share of active mode trips in the Inner Area (as set out in Figure 4.10).

5 Journey to Work Patterns by Local Board Area

Key Findings

- Local Board areas range in size with Howick having the highest number of commuting residents at 48,000 n 2013 and Waitemata the highest number of destinations at 111,000. At the other end of the scale, Papakura had 13,000 commuting origins and Waitakere Ranges 7,000 destinations.
- In 2013, the level of self-containment in the Local Board areas (the proportion of workers resident in the area who work in the same area) varied from 18 per cent in Puketapapa to 67 per cent for Waitemata. High values of 50 per cent or more are also recorded for the more rural areas of Rodney and Franklin. For the Region as a whole, 35 per cent of workers have jobs in the Local Board area in which they live.
- Private transport accounts for 65 per cent or more of all commuting **by origin**, except for Waitemata where active modes have a very high share and public transport is also important. The highest private transport shares are experienced in Manurewa and Howick where they are about 85 per cent of the total.
- Public transport shares for trips by origin are highest in Waitemata and the adjacent Albert-Eden. The shares are lowest in Franklin and Rodney and are generally low in the south.
- The share of private transport in commuting **by workplace** is lowest for Waitemata and is also low for peripheral areas where the share of work at home is high.
- Public transport accounts for 21 per cent of commuting to Waitemata, but accounts for 6 per cent or less for the other Board areas.
- Between 2006 and 2013 private transport accounted for only 10 per cent of the growth of commuting for those living in Devonport-Takapuna and 17 per cent for Waitemata. It was also less than 40 per cent for residents of the neighbouring areas of Albert-Eden, Orakei and Kaipatiki. The shares were typically high, 85 per cent or more, for Boards in the south.
- The public transport share of growth of trips by origin was highest for Kaipatiki and Maungakiekie-Tamaki accounting for more than 60 per cent of total growth.
- Active modes accounted for 47 per cent of growth in Waitemata and also had a high share for Devonport-Takapuna and Orakei. Elsewhere the shares were small and in 5 board areas the numbers fell.
- For Whau, Kaipatiki and Maungakiekie-Tamaki, the number of private transport journeys to the areas fell between 2006 and 2013. In the first two of these, the total numbers of journeys also fell and in Maungakiekie-Tamaki the total was unchanged. In other areas, the share of private transport in growth ranged from 23 per cent in Waitemata to over 100 per cent in Manurewa and Papakura and was generally at 90 per cent or more for the Boards in the south.
- Despite some declines in total trips, the numbers of public transport journeys grew for all commuting movements to workplaces taking the highest shares of more than 30 per cent in journeys to Waitemata and Orakei.
- Active modes contributed 27 per cent of the growth in trips to Waitemata destinations and 11 per cent to Devonport-Takapuna but elsewhere the share was small.

5.1 Introduction

The Local Board areas form the next level of disaggregation of locations within the Auckland Region. The journey to work patterns for these have been analysed and the key findings are set out below in this section. More detailed material is set out in the matrices in Appendix A.

The Local Board areas are set out in Figure 5.1.

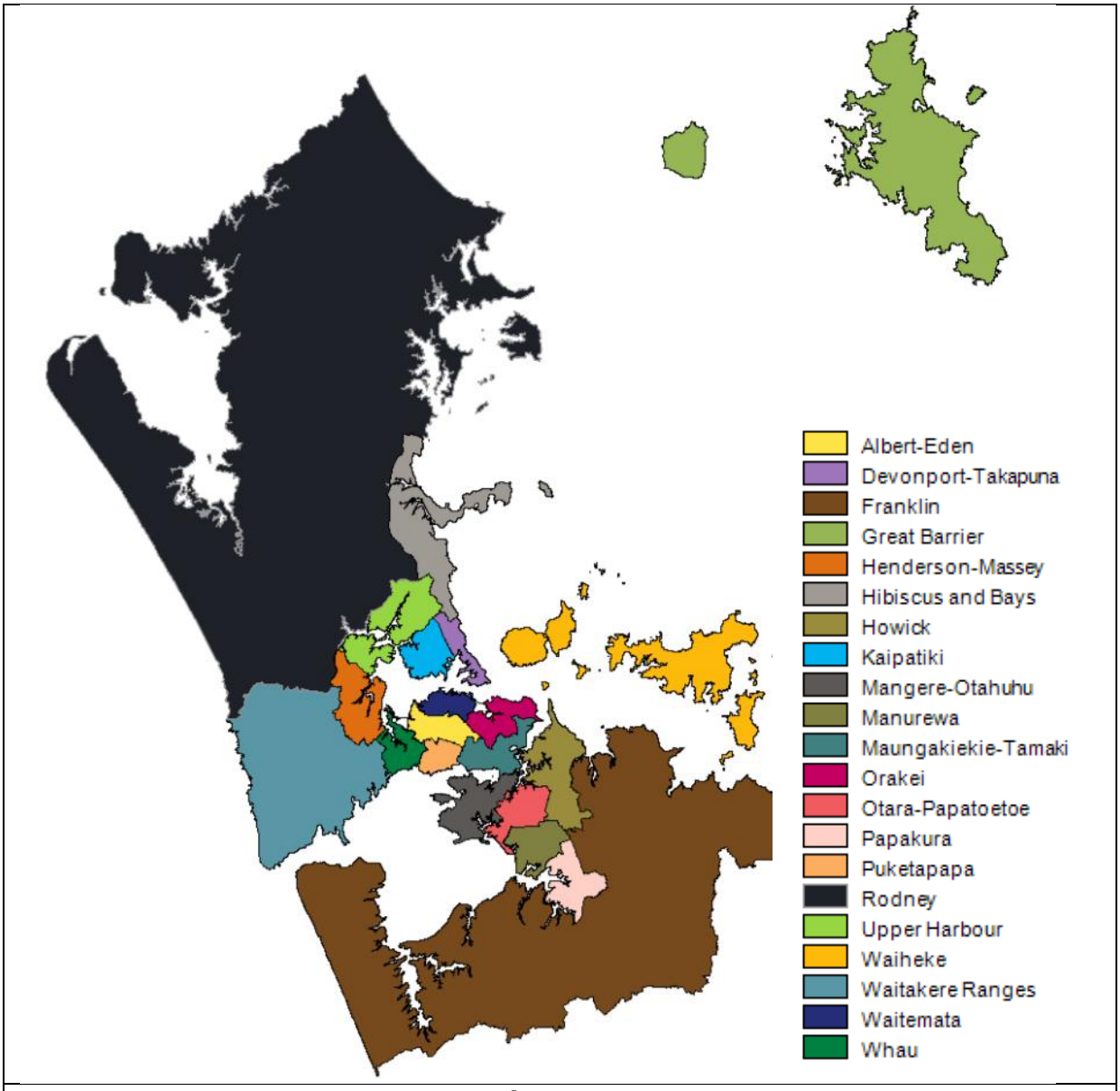


Figure 5.1
Local Board Areas

5.2 Journey to Work Patterns in 2013

5.2.1 Commuting by Residents

While the detailed journey to work patterns in 2013 are set out in Appendix A, the key highlights for commuting journeys by Local Board residents are set out in Table 5.1 and Figure 5.2.

Table 5.1
Modal Shares for Journey to Work Trips by Residents in Local Board Areas 2013

Local Board Area	Mode Share for Travel to Work				Level of Self Containment (1)
	Private Transport	Public Transport	Active Modes	Work at Home	
Rodney	72%	2%	3%	20%	54%
Hibiscus and Bays	78%	7%	3%	11%	35%
Upper Harbour	78%	7%	3%	9%	38%
Kaipatiki	75%	11%	3%	7%	29%
Devonport-Takapuna	65%	8%	8%	11%	39%
Henderson-Massey	82%	6%	4%	5%	34%
Waitakere Ranges	79%	7%	2%	10%	22%
Waitemata	45%	13%	30%	8%	67%
Whau	77%	10%	4%	6%	24%
Albert-Eden	68%	13%	8%	8%	27%
Puketapapa	77%	11%	3%	6%	18%
Orakei	73%	9%	5%	11%	29%
Maungakiekie-Tamaki	77%	9%	5%	5%	33%
Howick	84%	4%	2%	7%	39%
Mangere-Otahuhu	80%	6%	4%	4%	33%
Otara-Papatoetoe	82%	6%	4%	4%	29%
Manurewa	85%	5%	2%	4%	20%
Papakura	82%	6%	3%	6%	30%
Franklin	78%	2%	3%	14%	50%
Regional Average	**75%**	**8%**	**6%**	**8%**	**35%**

Note (1) The level of self containment is defined as the proportion of the resident workforce who are employed within the same Local Board area.

The modal information is summarised in Figure 5.2.

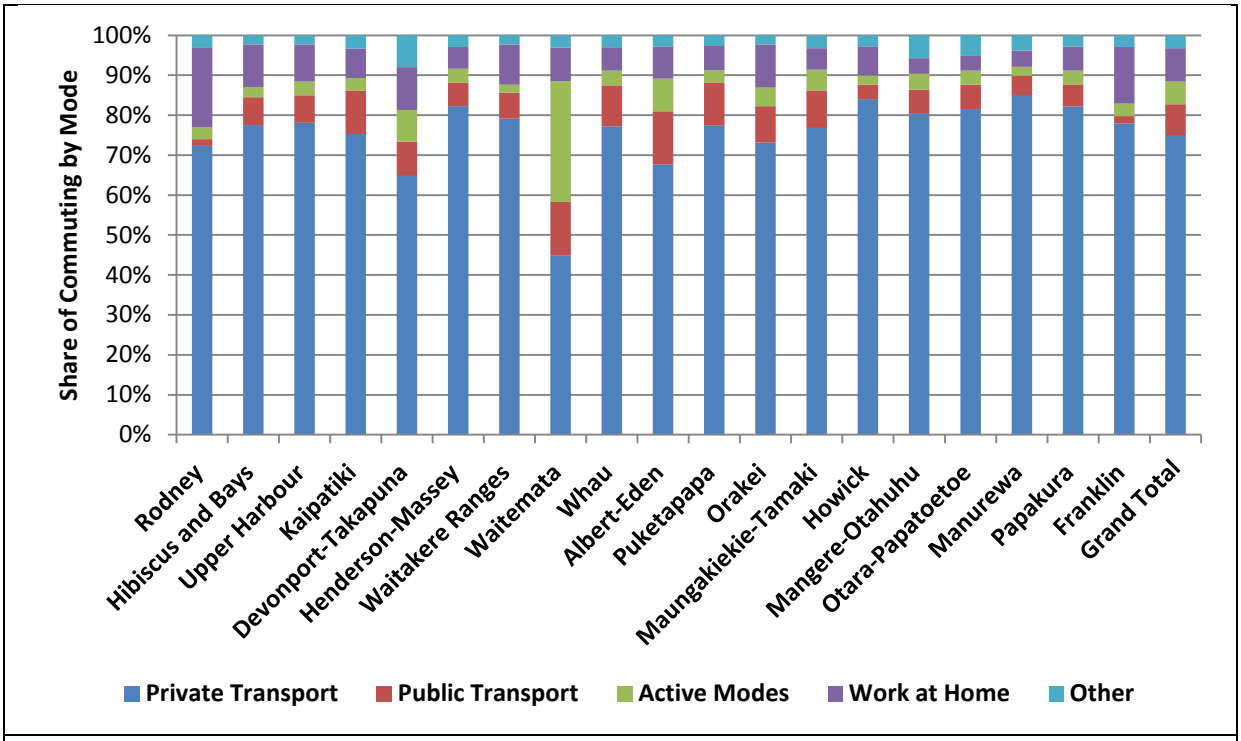


Figure 5.2
Modal Shares for Journey to Work Trips by Residents in Local Board Areas 2013

The share of private transport varies from 45 per cent for workers living in the centrally located Waitemata Board to 84 per cent for Howick and 85 per cent for the adjoining Manurewa. The public transport (rail and bus) share is highest for the Waitemata Board area, reflecting its proximity to the CBD employment, and also in the adjoining areas to the west (Albert-Eden, Puketapapa, and Whau and also Kaipatiki, in the southern part of the North Shore). Although ferry trips have not been isolated and are included in 'Other', it is likely that the inclusion of these in the figures for Devonport-Takapuna would again give a relatively high public transport share. All these Board Areas are ones that have benefitted from the investment in the bus and rail RTN.

The use of active modes is very high in the Waitemata Board area, reflecting the proximity of residential areas to a wide range of employment opportunities. Work at home is important for the more peripheral areas of Rodney and Franklin reflecting the relatively high share of agriculture and also the numbers of life-stylers choosing to locate in the area.

The highest levels of self-containment are experienced in the central Waitemata area where there are a very large number of jobs available for residents, and in the peripheral areas of Rodney and Franklin, the latter two areas in part reflecting the higher numbers working at home.

5.2.2 Commuting by Workplace

Commuting by workplace in the Local Board areas is set out in Table 5.2 and the modal shares summarised in Table 5.3 and Figure 5.3.

Table 5.2
Commuting by Mode by Workplace by Local Board Area 2013
Total Trips

Local Board Area	Private Transport	Public Transport	Active Modes	Work at Home	Other	Total
Rodney	9,912	321	657	3,951	540	15,381
Hibiscus and Bays	11,745	420	717	3,384	429	16,695
Upper Harbour	26,049	1,050	1,047	2,127	678	30,951
Kaipatiki	15,222	993	987	2,166	528	19,896
Devonport-Takapuna	17,814	1,512	1,692	2,331	699	24,048
Henderson-Massey	18,375	837	1,074	1,794	717	22,797
Waitakere Ranges	4,812	183	273	1,761	237	7,266
Waitemata	68,010	23,019	11,907	3,594	4,890	111,420
Whau	13,617	750	726	1,425	492	17,010
Albert-Eden	22,008	1,881	2,016	3,012	894	29,811
Puketapapa	6,543	402	504	1,047	300	8,796
Orakei	17,700	1,503	1,065	3,555	717	24,540
Maungakiekie-Tamaki	38,787	1,845	1,299	1,308	1,197	44,436
Howick	28,749	663	1,095	3,390	909	34,806
Mangere-Otahuhu	23,064	879	780	783	915	26,421
Otara-Papatoetoe	22,425	954	753	702	909	25,743
Manurewa	8,262	282	429	861	381	10,215
Papakura	7,689	228	474	741	315	9,447
Franklin	11,466	270	822	3,375	498	16,431
Total	**372,249**	**37,992**	**28,317**	**41,307**	**16,245**	**496,110**

Table 5.3
Commuting by Mode by Workplace by Local Board Area 2013
Proportion of Total

Local Board Area	Private Transport	Public Transport	Active Modes	Work at Home	Other	Total
Rodney	64%	2%	4%	26%	4%	100%
Hibiscus and Bays	70%	3%	4%	20%	3%	100%
Upper Harbour	84%	3%	3%	7%	2%	100%
Kaipatiki	77%	5%	5%	11%	3%	100%
Devonport-Takapuna	74%	6%	7%	10%	3%	100%
Henderson-Massey	81%	4%	5%	8%	3%	100%
Waitakere Ranges	66%	3%	4%	24%	3%	100%
Waitemata	61%	21%	11%	3%	4%	100%
Whau	80%	4%	4%	8%	3%	100%
Albert-Eden	74%	6%	7%	10%	3%	100%
Puketapapa	74%	5%	6%	12%	3%	100%
Orakei	72%	6%	4%	14%	3%	100%
Maungakiekie-Tamaki	87%	4%	3%	3%	3%	100%
Howick	83%	2%	3%	10%	3%	100%
Mangere-Otahuhu	87%	3%	3%	3%	3%	100%
Otara-Papatoetoe	87%	4%	3%	3%	4%	100%
Manurewa	81%	3%	4%	8%	4%	100%
Papakura	81%	2%	5%	8%	3%	100%
Franklin	70%	2%	5%	21%	3%	100%
Regional Average	74%	6%	7%	10%	3%	100%

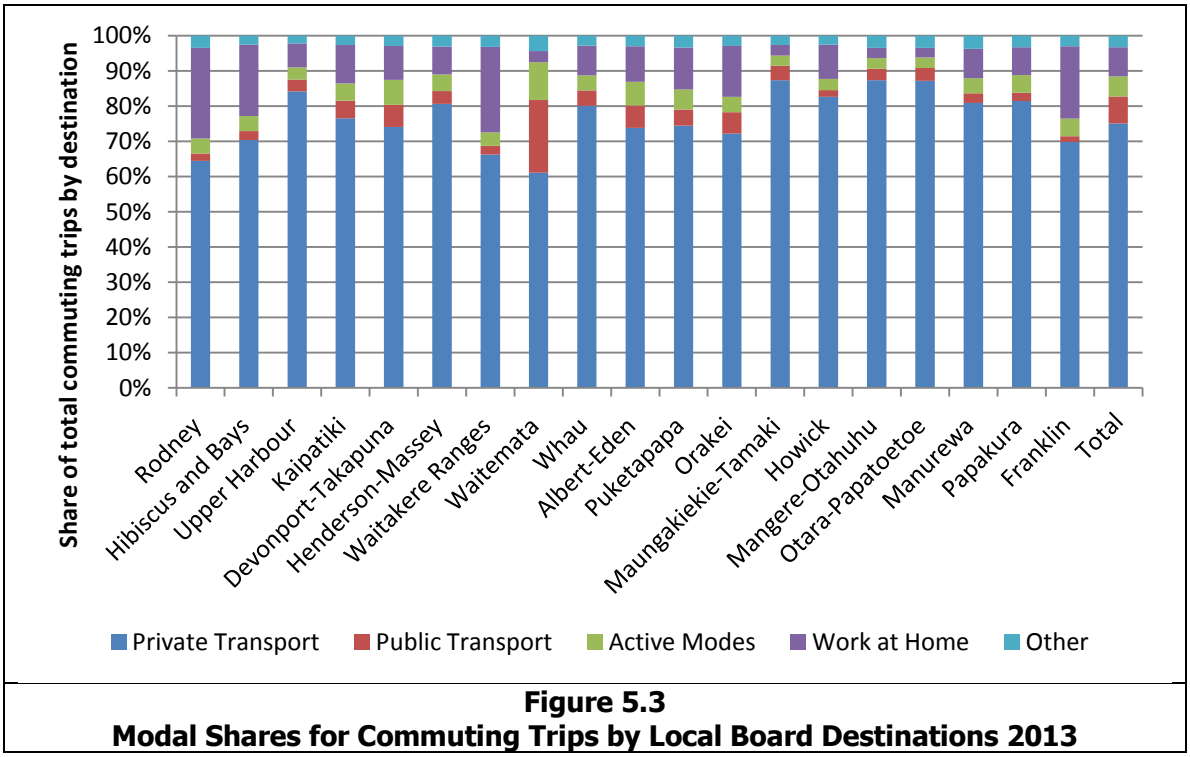


Figure 5.3
Modal Shares for Commuting Trips by Local Board Destinations 2013

The key points which emerge from the results set out above include:-

- Employment as measured by commuting in Local Board areas varies considerably from 7,000 in Waitakere Ranges to 111,000 in Waitemata.

- The share of private transport is relatively low in the central Waitemata Local Board area and in areas on the periphery of the Region. In Waitemata there is a high proportion of public transport and active trips and in the peripheral areas a relatively high share of work at home trips but low shares of public transport.

- The Waitemata area has the highest proportion of public transport trips by destination and accounts for about 60 per cent of the total. Public transport shares elsewhere were low with 3 central areas, Orakei, Albert-Eden and Devonport-Takapuna achieving 6 per cent and the remainder with lower values.

- Private transport use is high in areas to the south of the Region and exceeds 80 per cent in the area from Maungakiekie-Tamaki to Papakura. It is also above 80 per cent in Upper Harbour and Henderson-Massey.

5.3 Changes from 2006

5.3.1 Overall Changes in Journey to Work Patterns

The changes in journey to work patterns between 2006 and 2013 have also been investigated. The detailed results are set out in Appendix A, but the key findings are summarised below.

5.3.2 Changes by Origin

A summary of the changes by origin and mode is set out in Table 5.4 and Table 5.5 and Figure 5.4 to Figure 5.7.

Table 5.4
Changes in Commuting Trips by Origin and Mode 2006-2013
Numbers of Trips

Local Board Area	Private Transport	Public Transport	Active Modes	Work at Home	Other	Total
Rodney	2,091	141	21	264	81	2,598
Hibiscus and Bays	1,746	759	33	504	-75	2,967
Upper Harbour	2,433	750	234	399	-30	3,786
Kaipatiki	387	1,011	-159	192	-264	1,167
Devonport-Takapuna	108	468	264	225	36	1,101
Henderson-Massey	2,673	465	21	129	-123	3,165
Waitakere Ranges	1,023	363	24	201	-84	1,527
Waitemata	1,182	1,851	3,195	654	-15	6,867
Whau	1,341	291	36	123	-162	1,629
Albert-Eden	570	741	306	213	-195	1,635
Puketapapa	1,533	324	-63	45	-138	1,701
Orakei	417	717	288	285	-87	1,620
Maungakiekie-Tamaki	333	432	9	57	-129	702
Howick	3,678	351	39	450	-117	4,401
Mangere-Otahuhu	915	204	78	18	-45	1,170
Otara-Papatoetoe	738	120	-60	-39	-129	630
Manurewa	498	174	-27	-54	-45	546
Papakura	978	90	-75	132	-63	1,062
Franklin	2,619	174	-54	144	-27	2,856
Grand Total	**25,263**	**9,426**	**4,110**	**3,942**	**-1,611**	**41,130**

Table 5.5
Changes in Commuting Trips by Origin and Mode 2006-2013
(Per cent of Total Growth by Board)

Local Board Area	Private Transport	Public Transport	Active Modes	Work at Home	Other	Total
Rodney	80%	5%	1%	10%	3%	100%
Hibiscus and Bays	59%	26%	1%	17%	-3%	100%
Upper Harbour	64%	20%	6%	11%	-1%	100%
Kaipatiki	33%	87%	-14%	16%	-23%	100%
Devonport-Takapuna	10%	43%	24%	20%	3%	100%
Henderson-Massey	84%	15%	1%	4%	-4%	100%
Waitakere Ranges	67%	24%	2%	13%	-6%	100%
Waitemata	17%	27%	47%	10%	0%	100%
Whau	82%	18%	2%	8%	-10%	100%
Albert-Eden	35%	45%	19%	13%	-12%	100%
Puketapapa	90%	19%	-4%	3%	-8%	100%
Orakei	26%	44%	18%	18%	-5%	100%
Maungakiekie-Tamaki	47%	62%	1%	8%	-18%	100%
Howick	84%	8%	1%	10%	-3%	100%
Mangere-Otahuhu	78%	17%	7%	2%	-4%	100%
Otara-Papatoetoe	117%	19%	-10%	-6%	-20%	100%
Manurewa	91%	32%	-5%	-10%	-8%	100%
Papakura	92%	8%	-7%	12%	-6%	100%
Franklin	92%	6%	-2%	5%	-1%	100%
Grand Total	**61%**	**23%**	**10%**	**10%**	**-4%**	**100%**

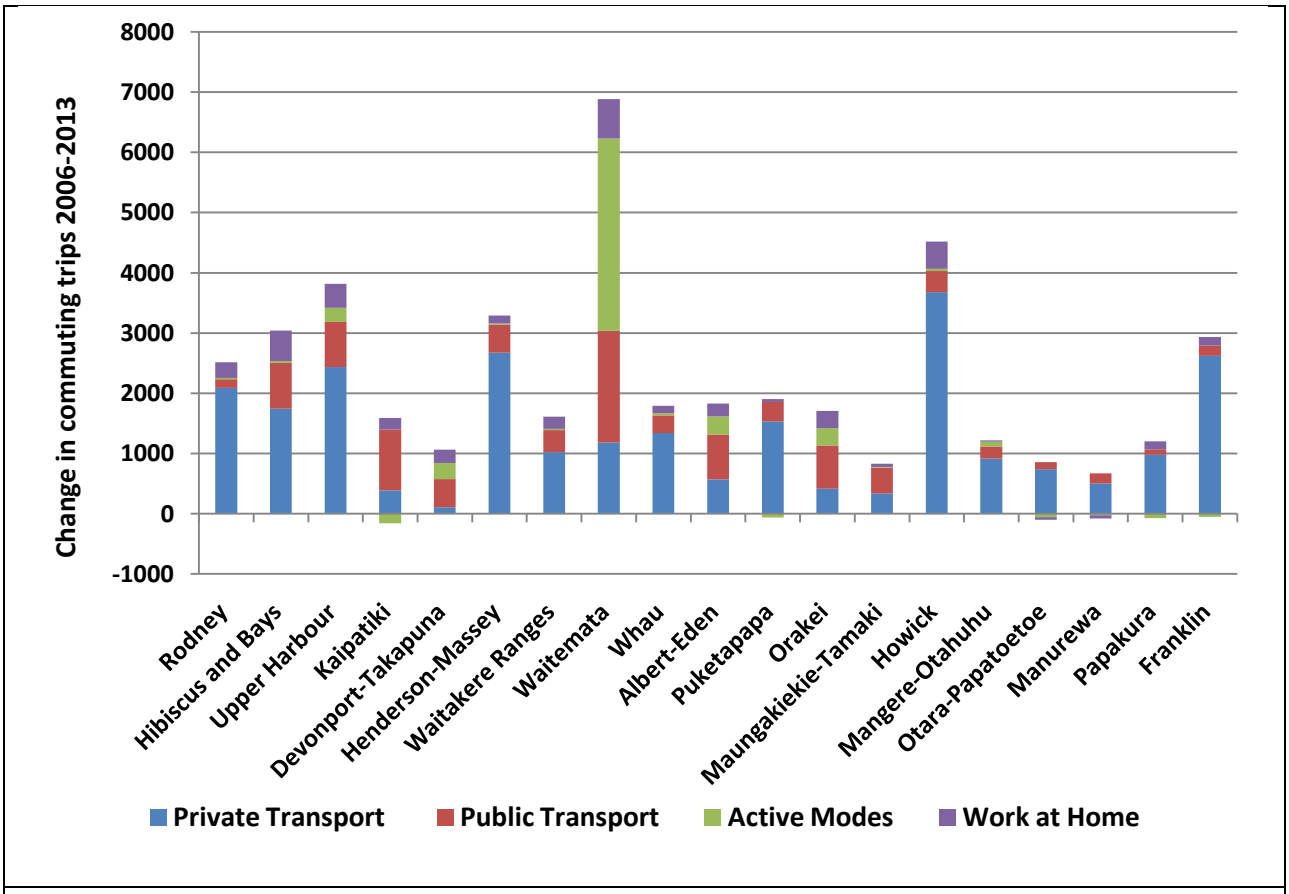


Figure 5.4
Changes in Trips by Mode and Origin 2006-2013

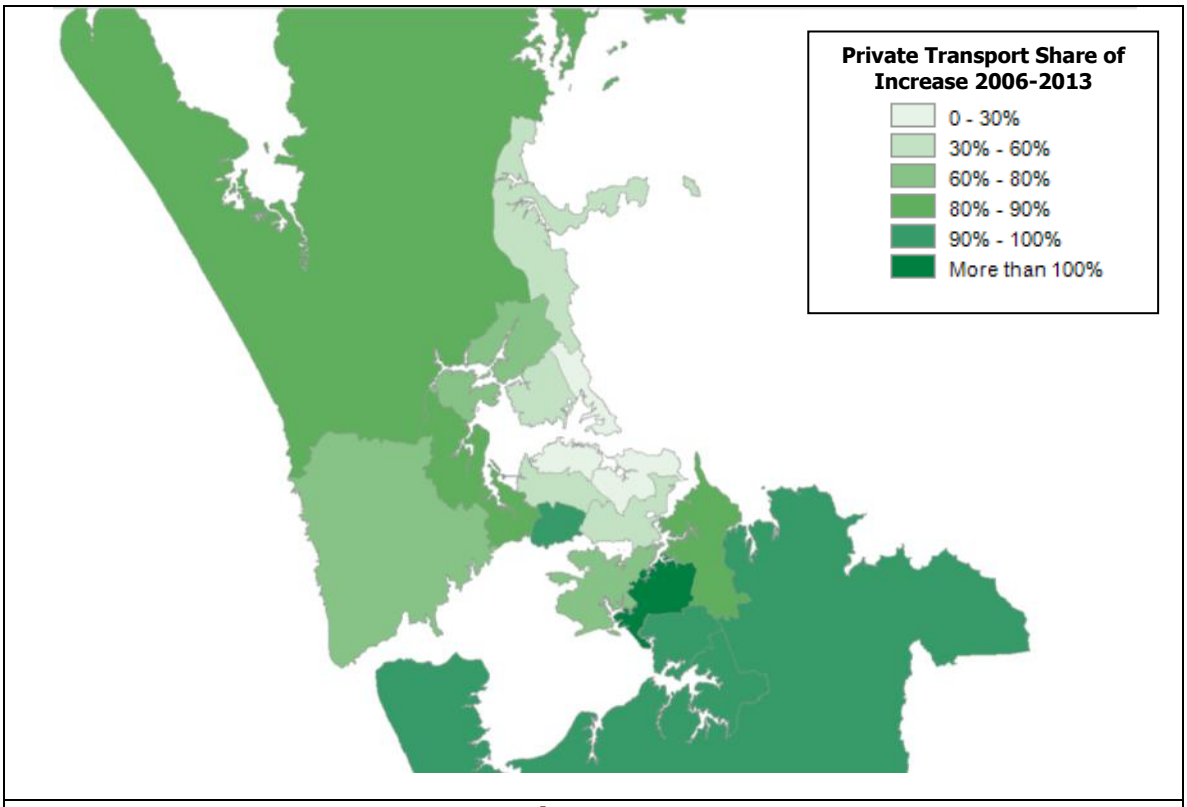


Figure 5.5
Private Transport Share of Growth in Commuting by Origin 2006-2013

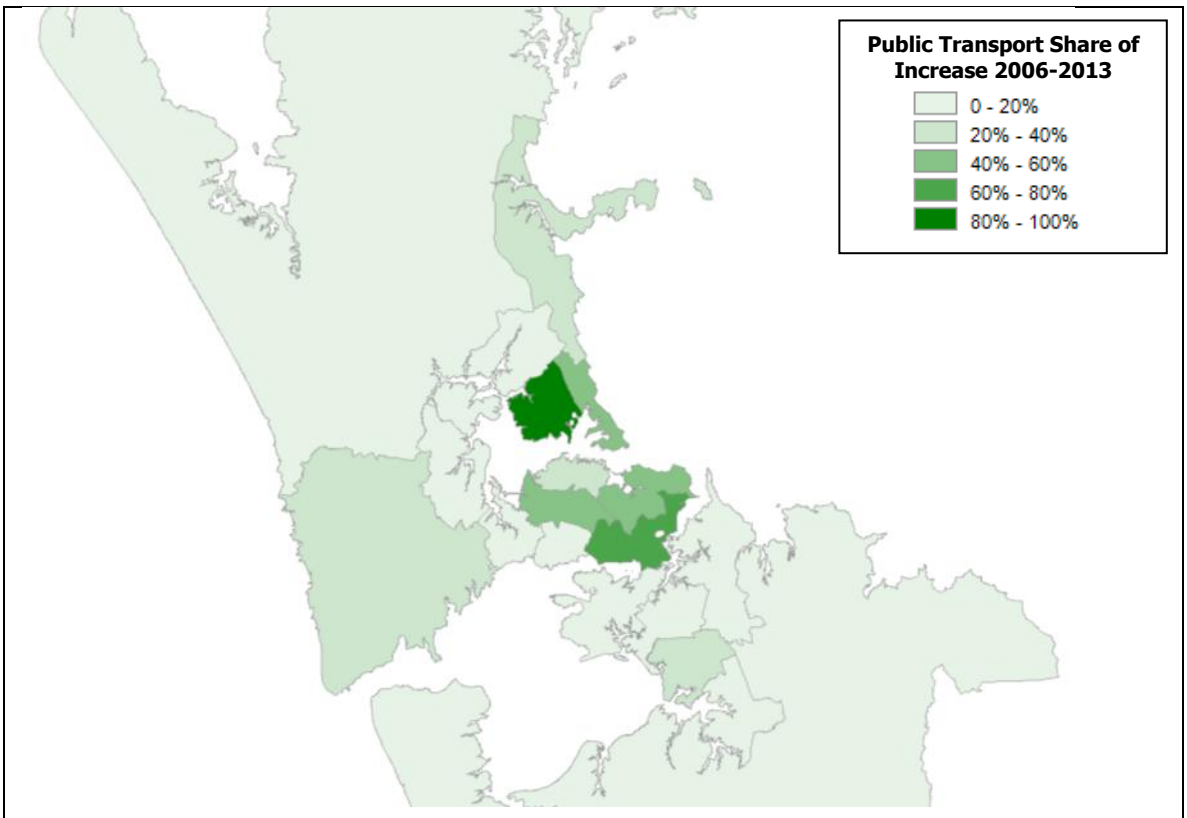


Figure 5.6
Public Transport Share of Growth in Commuting by Origin 2006-2013

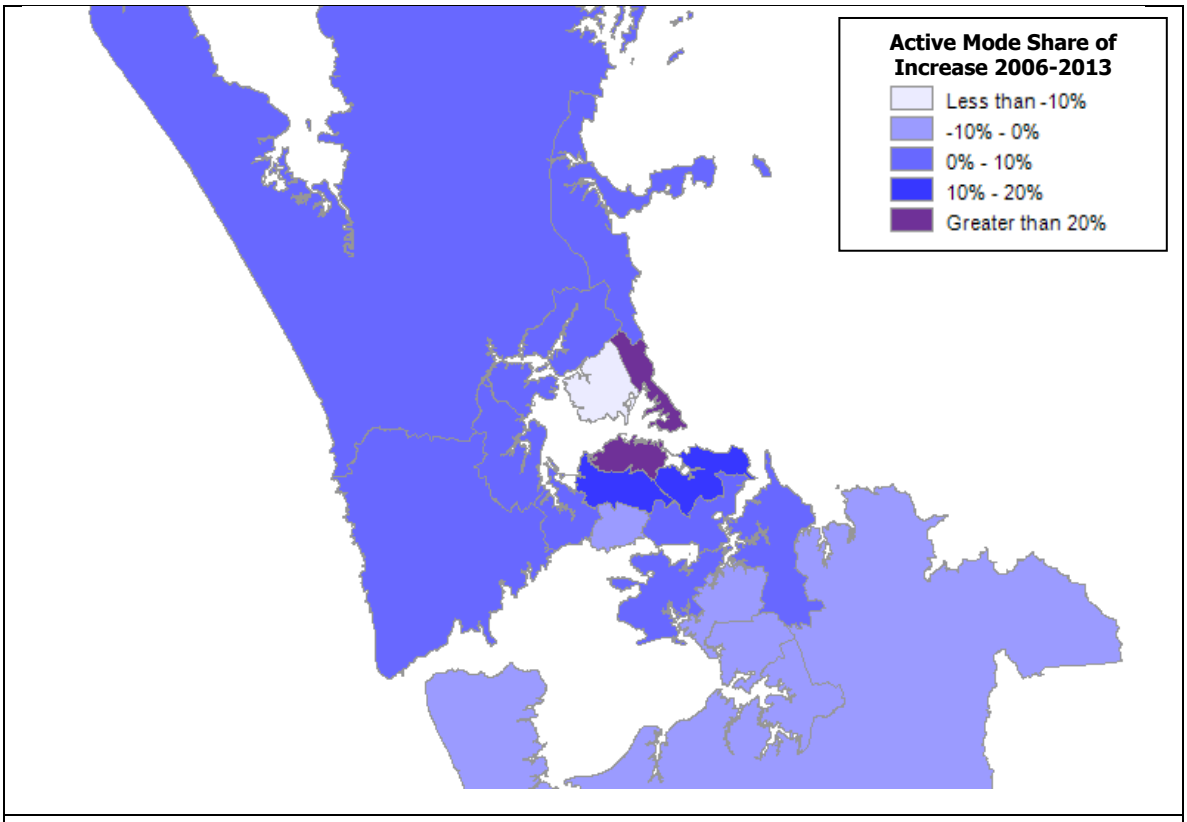


Figure 5.7
Active Mode Share of Growth in Commuting by Origin 2006-2013

While private transport and public transport commuting journeys have increased from all origins, the results show very different patterns in different areas:-

- While there are increases in private transport trips for commuters living in Waitemata, public transport and active mode journeys account for almost three quarters of the growth in commuting by residents.

- The private transport share of growth varies from 10 per cent in Devonport-Takapuna and 17 per cent in Waitemata to 117 per cent of the total growth in Otara-Papatoetoe. In general, the shares of private transport are higher in the Local Board areas away from the centre of the Region and are particularly high in the Boards to the south including Howick.

- Public transport accounts for more than half the total growth in Kaipatiki and Maungakiekie-Tamaki (where in both cases there has been a decline or no significant growth in employment) and more than 40 per cent of the total for the other inner areas of Devonport-Takapuna, Albert-Eden and Orakei. The share for Waitemata is slightly lower reflecting the substantial growth in active mode trips.

- While active mode trips have increased overall, with shares increasing particularly in the central parts of the Region, they have declined in a number of areas particularly in the south of the Region.

5.3.3 Changes by Destination

A similar analysis has been undertaken looking at the changes by destination and the results are set out in Table 5.6 and Table 5.7.

Table 5.6
Changes in Commuting Trips by Destination 2006-2013

Local Board Area	Private Transport	Public Transport	Active Modes	Work at Home	Other	Total Change
Rodney	1,935	234	63	204	33	2,469
Hibiscus and Bays	1,254	144	-18	459	12	1,851
Upper Harbour	5,223	654	366	390	69	6,702
Kaipatiki	-570	372	-39	168	-90	-159
Devonport-Takapuna	1,653	378	264	225	-12	2,508
Henderson-Massey	1,515	270	-3	102	-123	1,761
Waitakere Ranges	714	81	-12	177	-51	909
Waitemata	2,766	5,364	3,261	990	-138	12,243
Whau	-426	72	-12	138	-165	-393
Albert-Eden	1,362	321	138	228	-171	1,878
Puketapapa	240	63	12	6	-60	261
Orakei	930	534	51	237	-57	1,695
Maungakiekie-Tamaki	-315	444	36	96	-258	3
Howick	2,997	12	12	456	-135	3,342
Mangere-Otahuhu	2,307	81	90	-3	-147	2,328
Otara-Papatoetoe	1,596	273	48	-39	-111	1,767
Manurewa	600	30	-15	-54	-27	534
Papakura	237	18	-78	72	-87	162
Franklin	1,245	81	-54	90	-93	1,269
Grand Total	**25,263**	**9,426**	**4,110**	**3,942**	**-1,611**	**41,130**

Table 5.7
Changes in Commuting Trips by Destination 2006-2013
(Per cent Share of Total Growth by Board)

Local Board Area	Private Transport	Public Transport	Active Modes	Work at Home	Other	Total	Total (No)
Rodney	78%	9%	3%	8%	1%	100%	2,469
Hibiscus and Bays	68%	8%	-1%	25%	1%	100%	1,851
Upper Harbour	78%	10%	5%	6%	1%	100%	6,702
Kaipatiki (1)							-159
Devonport-Takapuna	66%	15%	11%	9%	0%	100%	2,508
Henderson-Massey	86%	15%	0%	6%	-7%	100%	1,761
Waitakere Ranges	79%	9%	-1%	19%	-6%	100%	909
Waitemata	23%	44%	27%	8%	-1%	100%	12,243
Whau (1)							-393
Albert-Eden	73%	17%	7%	12%	-9%	100%	1,878
Puketapapa	92%	24%	5%	2%	-23%	100%	261
Orakei	55%	32%	3%	14%	-3%	100%	1,695
Maungakiekie-Tamaki (1)							3
Howick	90%	0%	0%	14%	-4%	100%	3,342
Mangere-Otahuhu	99%	3%	4%	0%	-6%	100%	2,328
Otara-Papatoetoe	90%	15%	3%	-2%	-6%	100%	1,767
Manurewa	112%	6%	-3%	-10%	-5%	100%	534
Papakura	146%	11%	-48%	44%	-54%	100%	162
Franklin	98%	6%	-4%	7%	-7%	100%	1,269
Grand Total	**61%**	**23%**	**10%**	**10%**	**-4%**	**100%**	**41,130**

Notes (1) Because the total numbers of trips to Kaipatiki and Whau decline and the total to Mangakiekie-Tamaki remains more or less unchanged, the shares of the different modes in the changes for these Boards are hard to interpret and so the results have been excluded.

The share of private transport in the growth by destination is set out in Figure 5.8. As expected, the share of private transport in the growth of trips to the Waitemata Local Board area is relatively low and for Maungakiekie-Tamaki there is actually a reduction, possibly reflecting the zero growth in the total numbers commuting into the area. By contrast, destinations in the south of the Region have very high private transport shares in their growth and for Manurewa and Papakura, this represents more than 100 per cent of the growth with modes other than public transport declining.

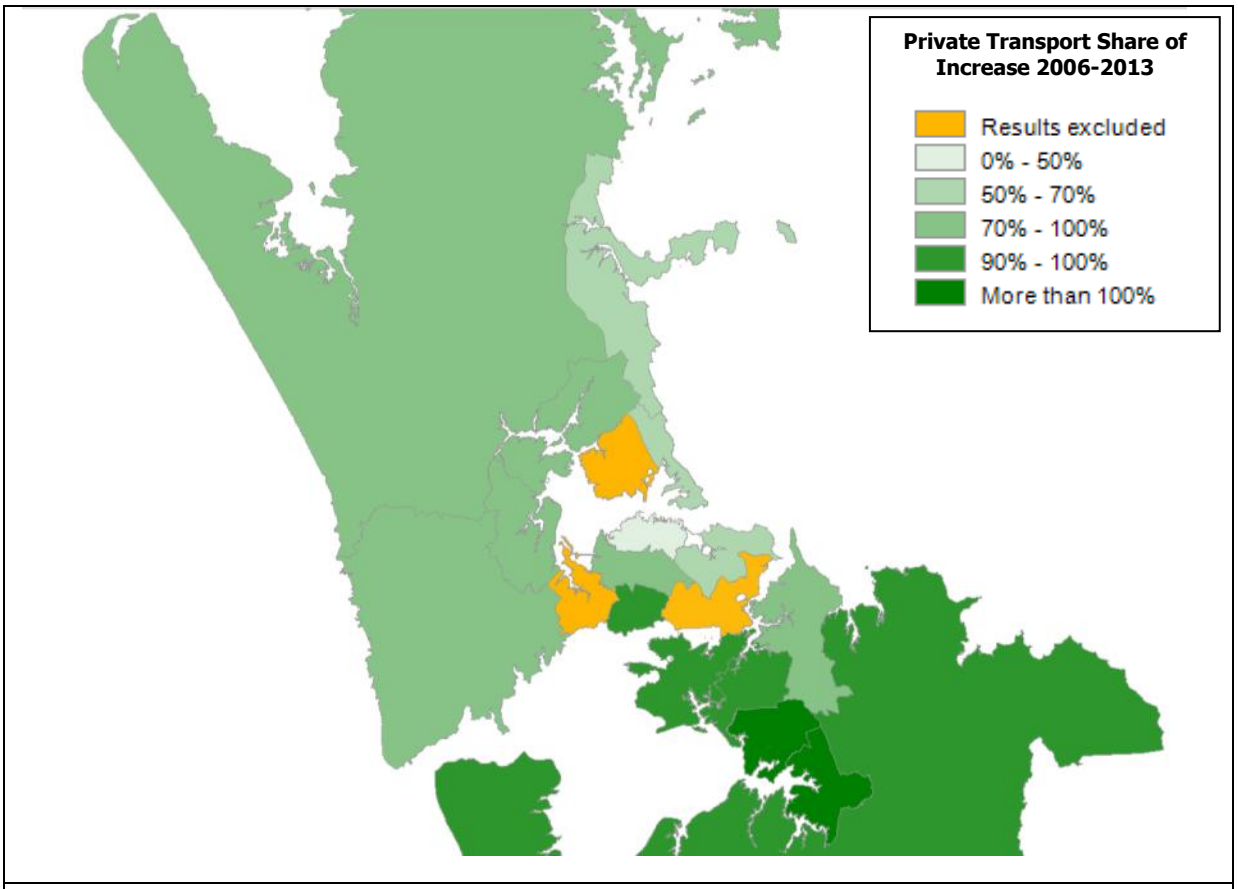


Figure 5.8
Private Transport Share of Growth in Commuting by Destination 2006-2013

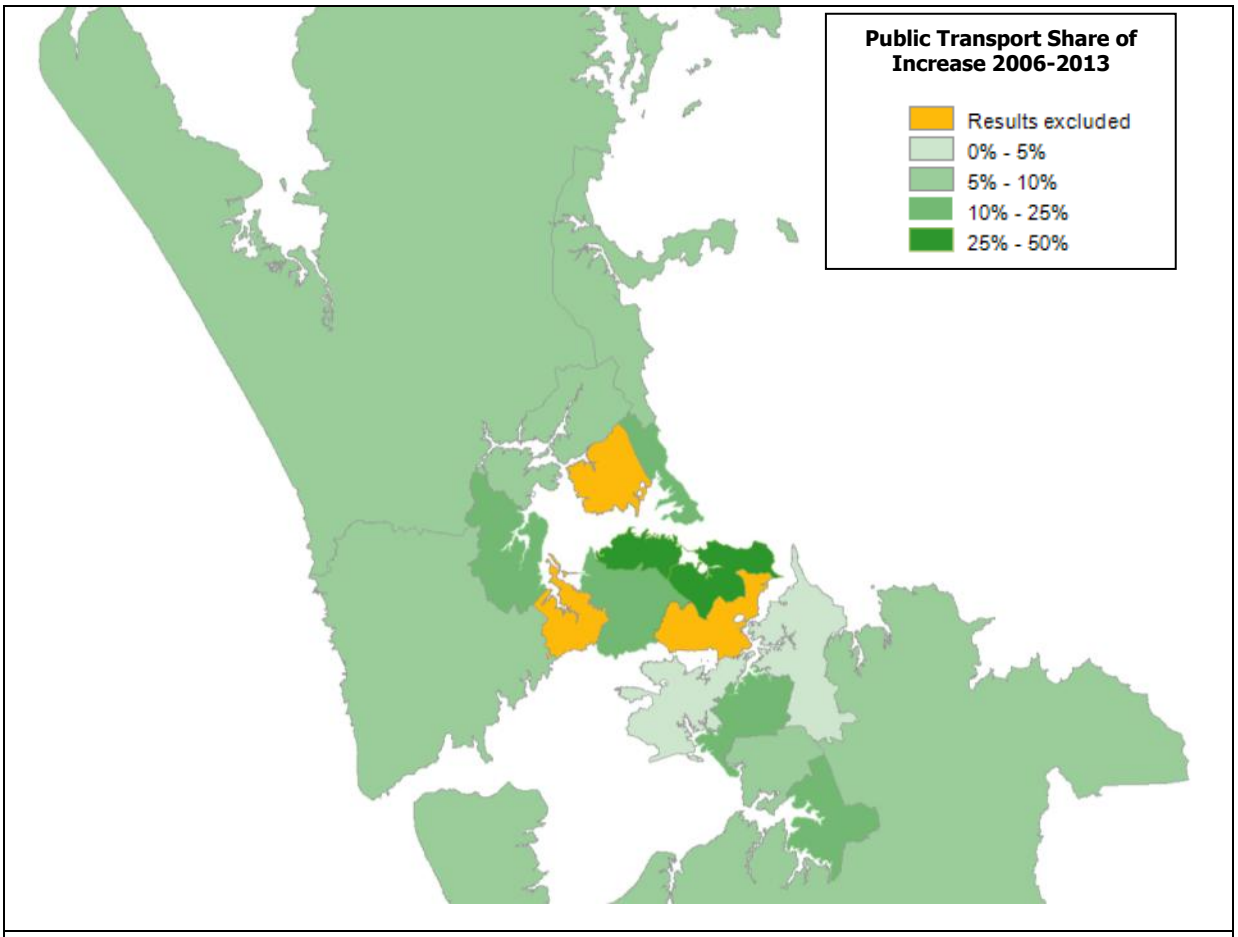


Figure 5.9
Public Transport Share of Growth in Commuting by Destination 2006-2013

The position for public transport is to some extent a mirror of the position for private transport. Public transport has a high share of the growth for commuting to the central areas of Waitemata and Orakei and lower shares further afield. Particularly noticeable is the low share for Howick and Mangere-Otahuhu which contain the major industrial areas of Highbrook/East Tamaki and the Airport area.

The share of active modes in the growth of trips by destination is set out in Figure 5.10.

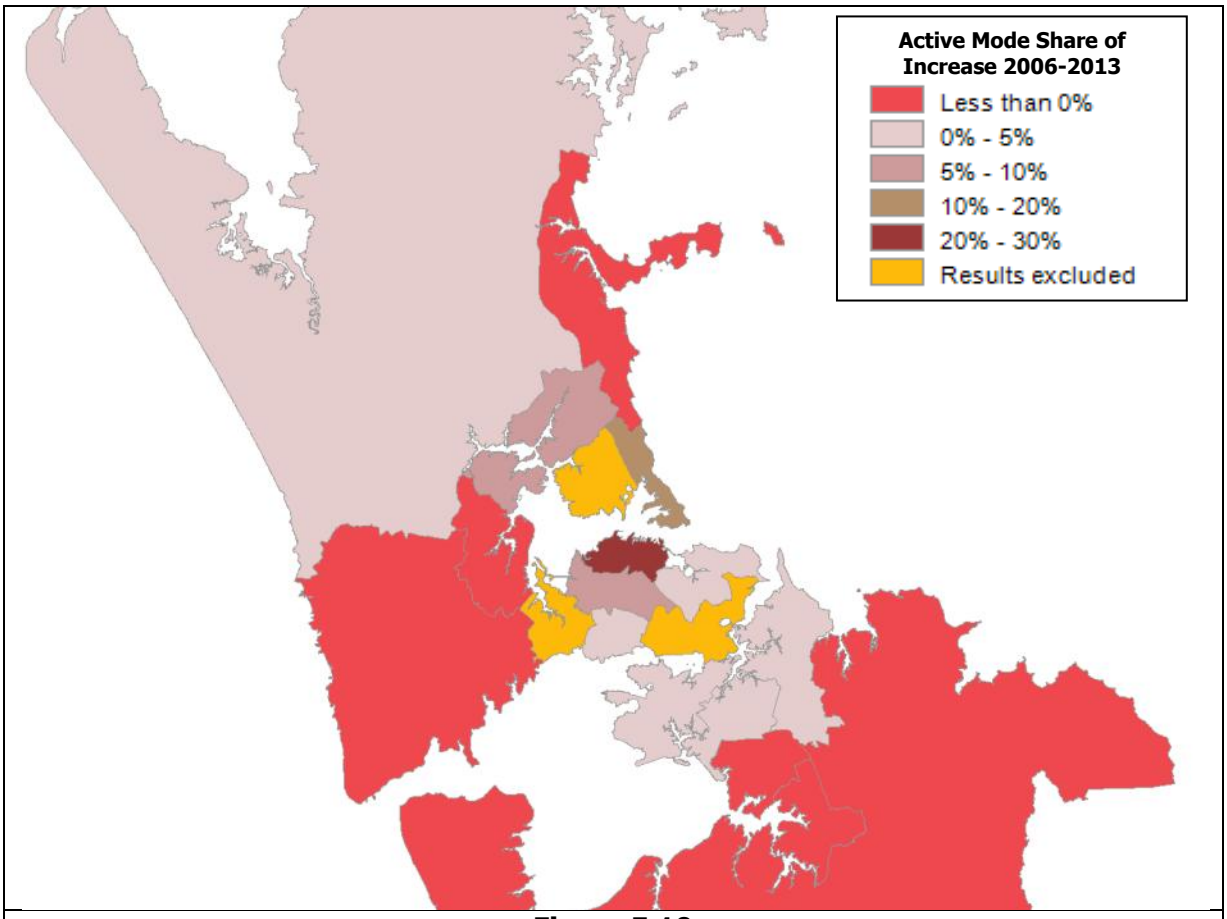


Figure 5.10
Active Mode Share of Growth in Commuting by Destination 2006-2013

This shows a pattern of active modes reducing in the south, the west and Hibiscus and Bays and with generally increasing shares towards the central areas of Waitemata and Devonport-Takapuna.

6 Analysis at a CAU Level

Key Findings

- Commuting distances from workers' homes generally increase with distance away from the CBD, although they are typically longer on the North Shore than south of the Waitemata Harbour.
- Trip lengths by place of work do not display such a consistent pattern, although these tend to be longer for the larger formal employment areas.
- The share of private vehicle usage is highest for areas away from the centre, particularly to the west, between Howick and Papakura and the Airport and Manukau.
- The share of bus use is highest in the corridor between the CBD and the areas to the south and along the line of the Northern Busway.
- The share of rail usage is highest along the rail corridor especially for areas reasonably close to the centre. It is also very high along the route of the Onehunga Line.
- Work at home trips are highest in rural areas and in coastal areas on the North Shore, Waitemata Harbour and Hauraki Gulf.
- Rail travel has increased from areas along the rail line. Bus travel has increased along the Northern Busway and along the corridor between the CBD and Dominion Road/Mount Eden Road. There have been some declines in bus travel in rail-served areas.

6.1 Introduction

The analysis at a detailed CAU level considers a selection of broad measures of commuting activity including:-

- Average journey distances for residential and workplace locations for 2013.
- The shares of modes by residential area for 2013.
- Changes in trip making between 2006 and 2013.

Where appropriate, the graphs displaying these results distinguish between shares or distances that are above or below the average for the Region by the use of a different colour scale.

6.2 Travel Distances

The average commuting trip lengths for journeys by residential zone are set out in Figure 6.1. As discussed earlier, these are based on the road distances between CAUs.

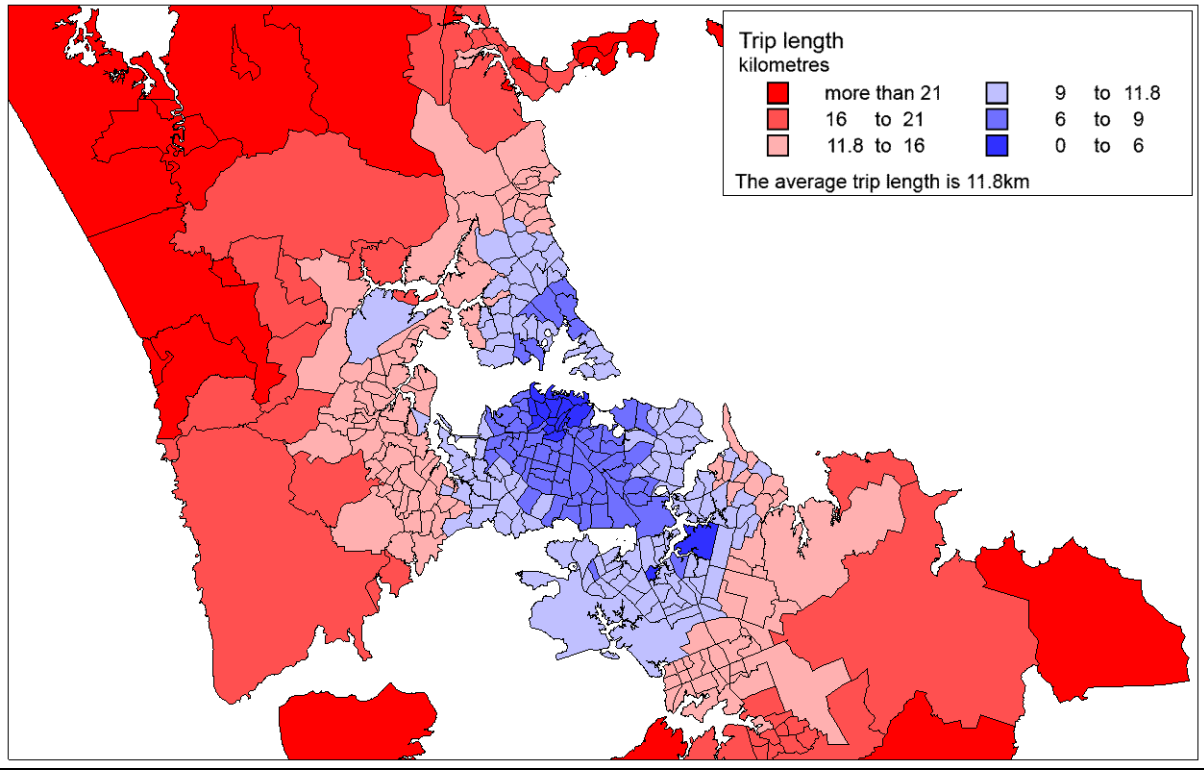


Figure 6.1
Trip Length by Residential Area 2013

Average trips lengths by residential area are typically lowest at less than 6 kms for the CBD, reflecting the large number of jobs in the area. Trip lengths are also particularly low at Middlemore, presumably reflecting the high employment at the hospital and the numbers of workers living in its vicinity in hospital housing.

Away from the CBD, average commuting trip length increases in a series of broadly concentric bands with the longest trip lengths for workers resident in the rural fringes around the Region. (The method used to calculate distances mean that the trip lengths for areas served by ferries, such as the Devonport area, may be overestimated). There are some variations away from this, particularly around the major employment areas of Onehunga, Penrose and Highbrook, where resident populations are typically low and where there are particularly high numbers of adjacent employment opportunities. Travel distances for North Shore residents are typically longer than those south of the Waitemata Harbour, possibly reflecting a greater concentration of employment opportunities at particular locations rather than the more dispersed pattern found further south.

Trip lengths by destinations are set out in Figure 6.2.

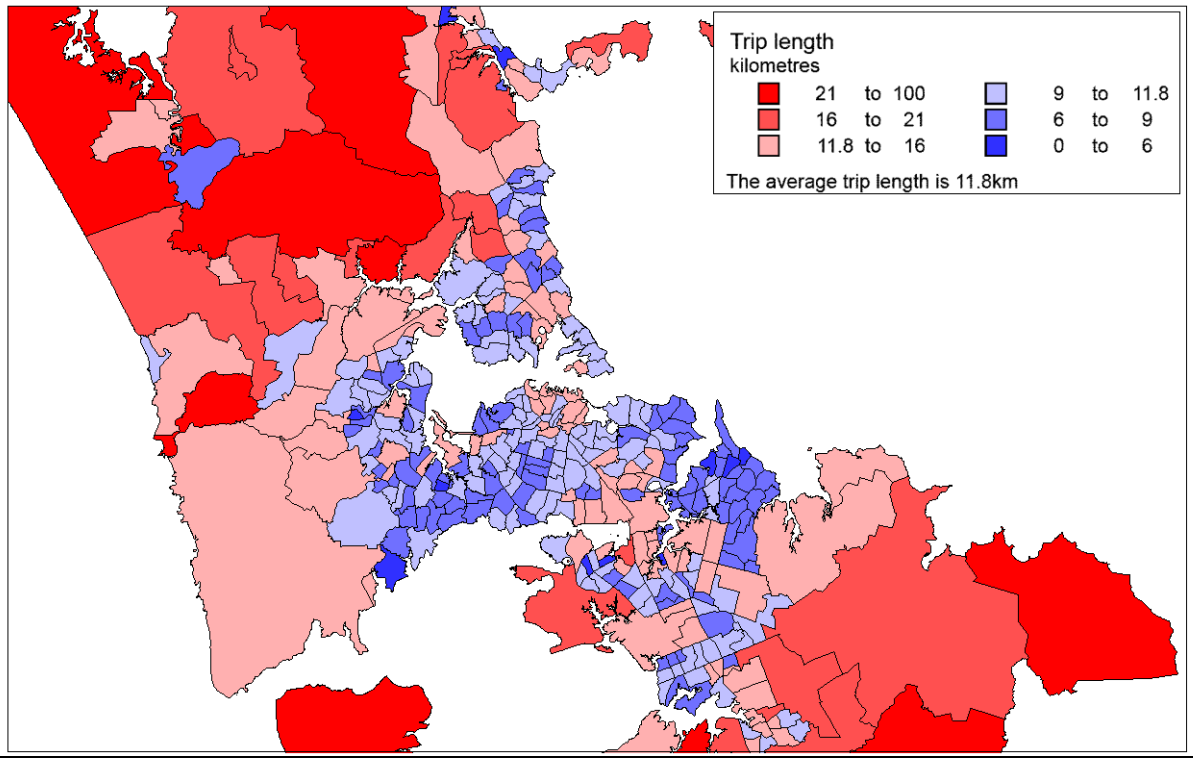


Figure 6.2
Trip Length by Workplace 2013 – All Trips

For almost all workplace destinations, travel distances exceed 6 kms and there is not the clear pattern experienced for the average distances by residential area. For much of the Isthmus, trip lengths are between 6 and 9 kms, although the major employment areas in and around the CBD and in the main rail and motorway corridor to the south towards Manukau have higher travel distances of up to 15 kms. The Airport also attracts trips from a wider area as does the neighbouring area stretching to the centre of Manukau.

These trip patterns to some extent reflect the nature of the large employment areas. Because of their size, these require workers from a relatively wide area to fill the large numbers of jobs available. In addition, because of the often specialised nature of activity and the relatively high wages paid, firms in these locations are able to attract workers from a wide area, who are prepared to trade off the increased costs of commuting against the increases in wages earned. Smaller employment centres may offer wage rates that are not sufficient to attract commuters from wide areas and are also probably more able to satisfy their more limited worker requirements from those living closer.

To examine whether there are different patterns for those commuting by private transport, the average journey distances for these trips are set out in Figure 6.3. Although the average trip length for trips by private vehicle users at 13.5 kms is higher than the average for all users, 11.8 kms, it should be noted that to allow comparison with the position for all trips, Figure 6.3 uses the same scale as Figure 6.2.

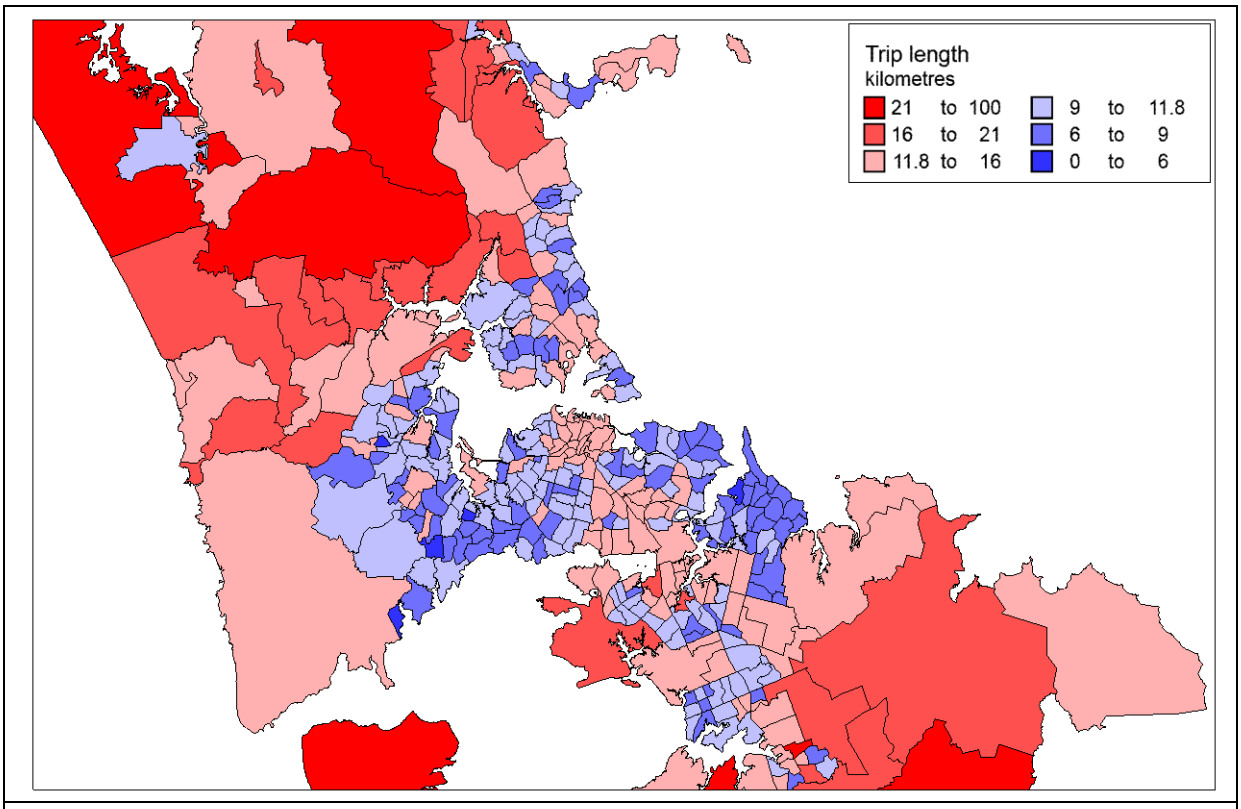


Figure 6.3
Trip Length by Workplace 2013 – Private Vehicle Trips

While on average the trip length for private vehicle trips is higher than the average for all trips, at an individual zonal level the position is fairly mixed and in some instances the private vehicle trip length is lower than the average. This occurs at a number of outer locations where public transport may provide an attractive opportunity for longer distance journeys. Examples of these locations include:-

- Areas to the west along the route of the rail line.
- Areas in the north along the Whangaparaoa Peninsula, to the north of Devonport and some areas around Browns Bay.
- Areas to the south around Papakura.

6.3 Use of Different Modes

6.3.1 Use of Private Vehicles

The share of trip making by private cars measured as a proportion of the total trips from the area is set out in Figure 6.4.

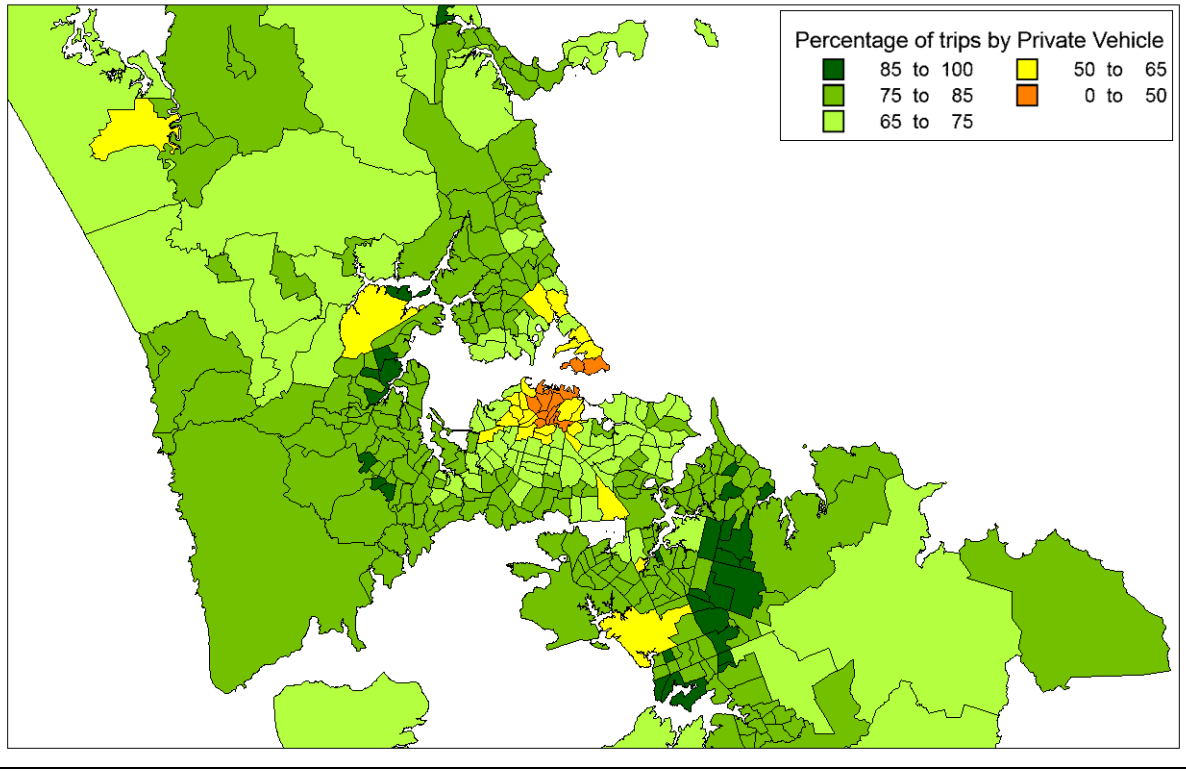


Figure 6.4
Share of Private Vehicle Trips by Origin

Private vehicle use is low in the CBD and then generally increases as the distance from the centre grows but with relatively low use in Takapuna and Manukau reflecting high shares of public transport and active modes. The areas of highest private vehicle usage are away from the Isthmus particularly in a band stretching south from Howick down to Papakura and also in Waitakere to the west.

6.3.2 Use of Buses

The share of trip making by bus is set out in Figure 6.5.

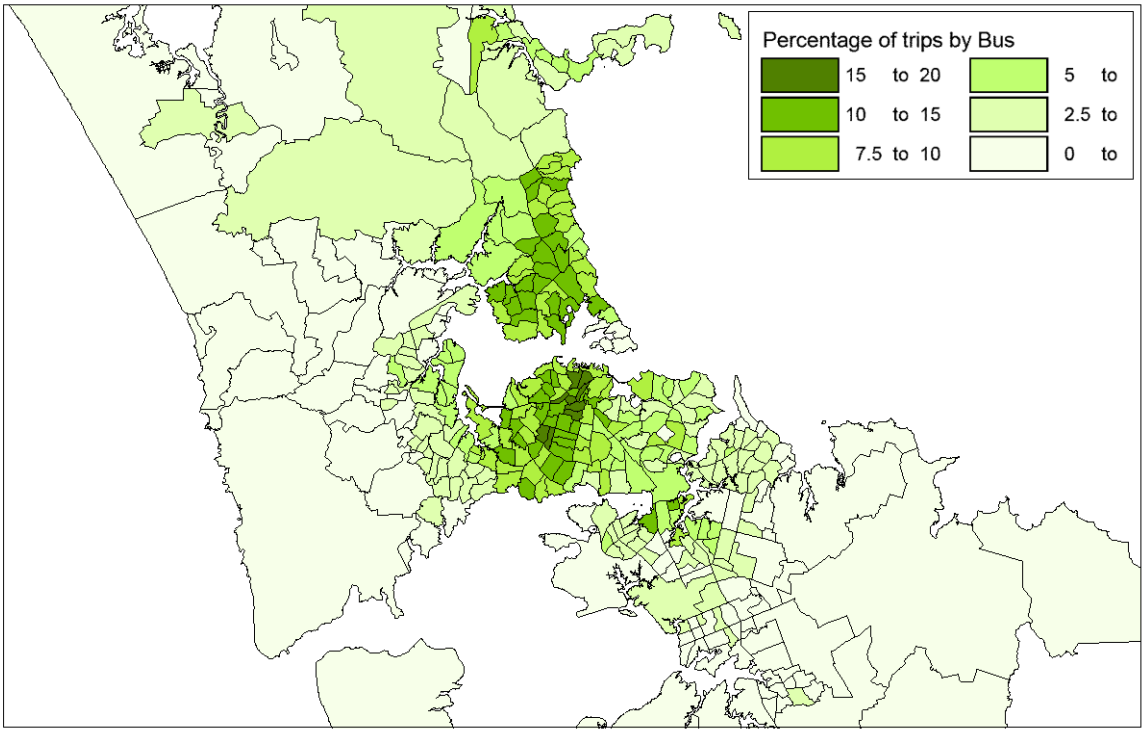


Figure 6.5
Share of Bus Trips by Origin

The highest shares of bus trips lie mainly in the corridor stretching south from the CBD along Mount Eden and Dominion Roads. Bus use is also relatively high on the North Shore both along the Busway corridor and in areas to the west particularly towards Birkenhead and Beachhaven and to a slightly lesser extent in the east along the coast. In general, bus use is highest in the Isthmus and on the North Shore, and away from this use is fairly limited. There is also a low share of bus use in new development areas such as Stonefields and Flatbush, with the Stonefields figure being much lower than that in the surrounding area.

6.3.3 Use of Rail

The use of rail is set out in Figure 6.6.

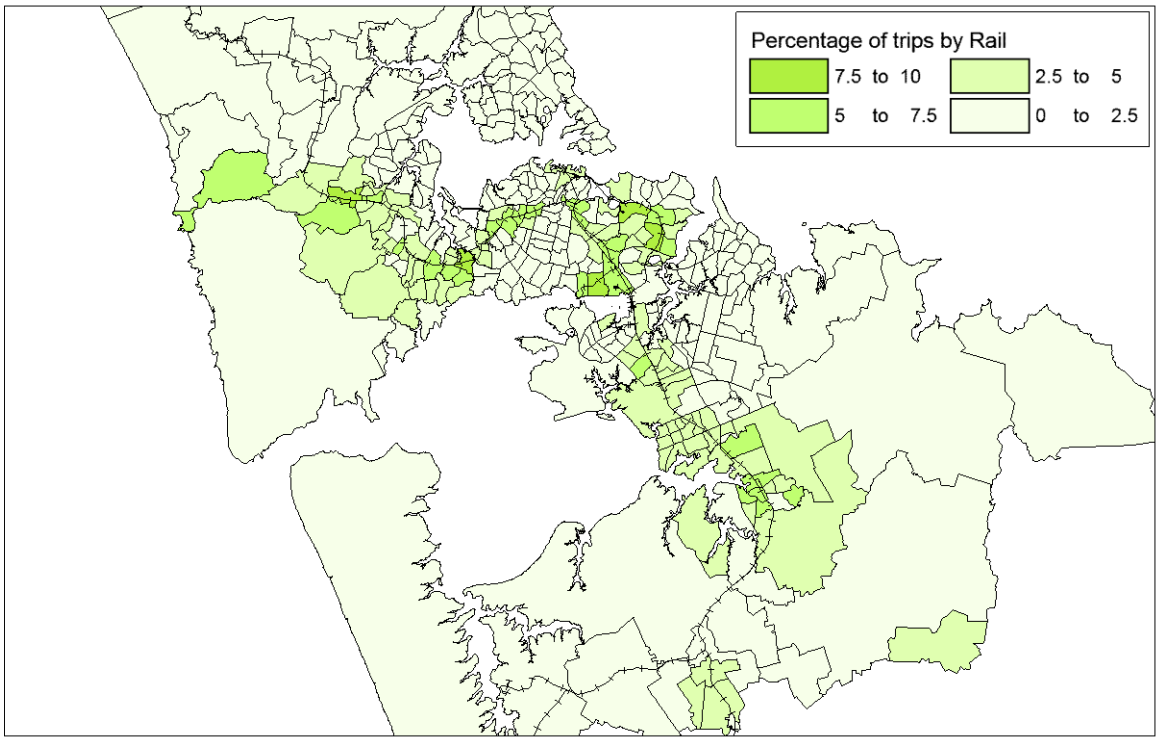


Figure 6.6
Share of Rail Trips by Origin

Rail use is unsurprisingly concentrated along the rail lines. There are particularly high shares along the Western Line west from New Lynn, the Eastern Line through Meadowbank and Glen Innes, and also in Penrose and Onehunga where the newly opened Onehunga Branch Line appears to have been successful in attracting a relatively high share of commuting trips to rail. Further afield, there are also relatively high shares in the Papakura area and in Swanson, reflecting the high level of services provided and the good connections to the major employment areas, and to a lesser extent in the corridor from Avondale to Newmarket. The more limited effect here may be the result of competition from bus which can provide a more direct route into the city over these shorter distances.

The extent to which rail is used for commuting to the CBD is set out in Figure 6.7.

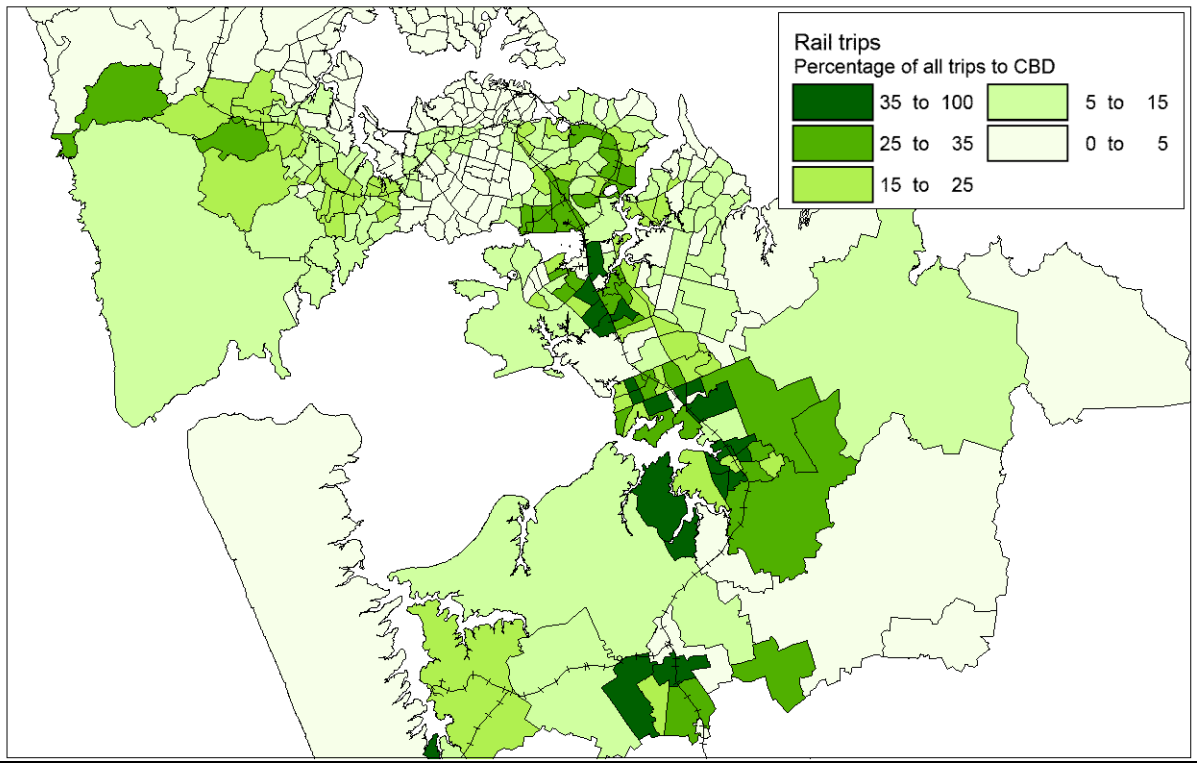


Figure 6.7
Rail Share of Trips to CBD 2013 (per cent of total)

The share of rail in trip making to the CBD is relatively high in a corridor covering the Eastern Line through Glen Innes and then the Southern Line to the south where the shares in areas in Manukau and further south in Papakura and Pukekohe are 35 per cent or more (although the absolute numbers are relatively small). Rail also has a relatively high share of trip making to the CBD along the line of the Onehunga Line following its opening in 2010.

6.3.4 All Public Transport Users

The position for all public transport users is set out in Figure 6.8.

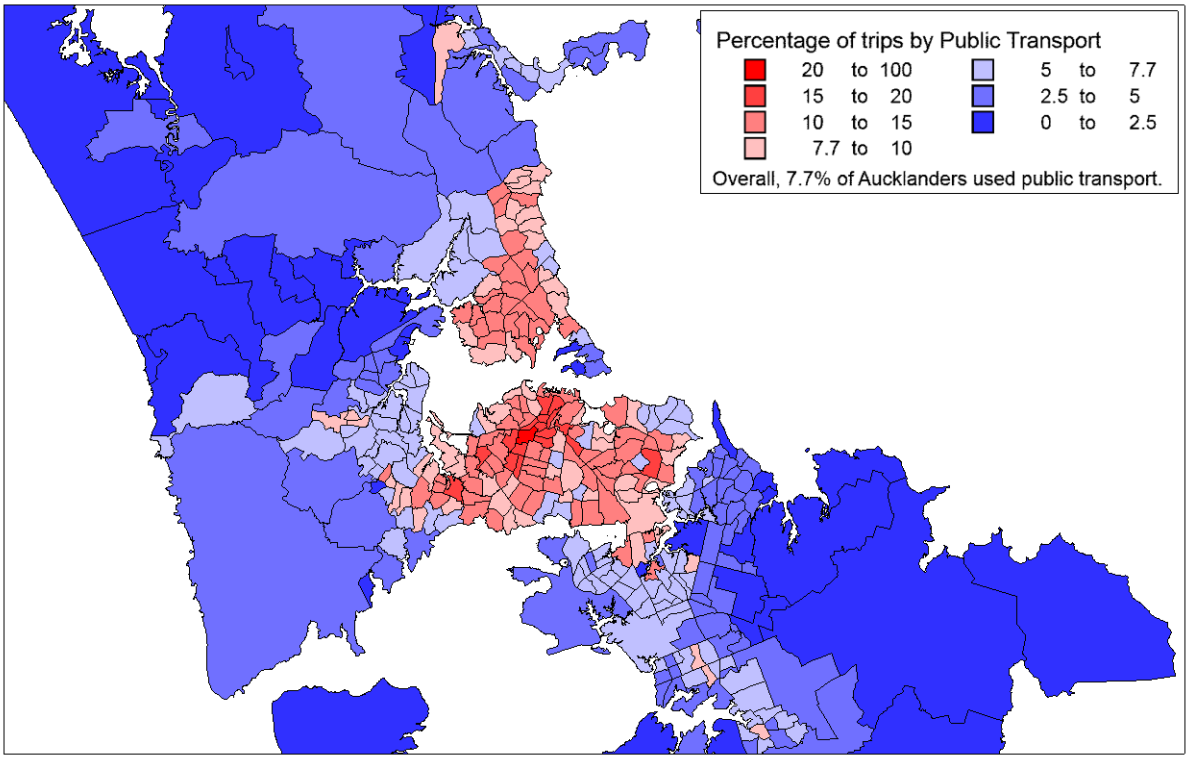


Figure 6.8
Share of Public Transport Trip Making by Origin

Combining the results for rail and bus commuters, the highest shares for overall public transport use are for trips from the CBD and from the area to the south where high frequency bus routes and the rail coincide. There is also strong public transport usage along the line of the rail corridor to New Lynn and in the east along the rail corridor in Glen Innes and Panmure. In addition, there is substantial public transport use in the corridors south of the CBD where each mode is strong, and also to the north along the Busway and Onewa Road corridors.

In general, overall public transport use is relatively high for trips from origins in the Isthmus and the North Shore but is lower for trips from further afield.

The choice between rail and bus is set out in Figure 6.9. This excludes areas north of the Waitemata Harbour since for these only bus is available.

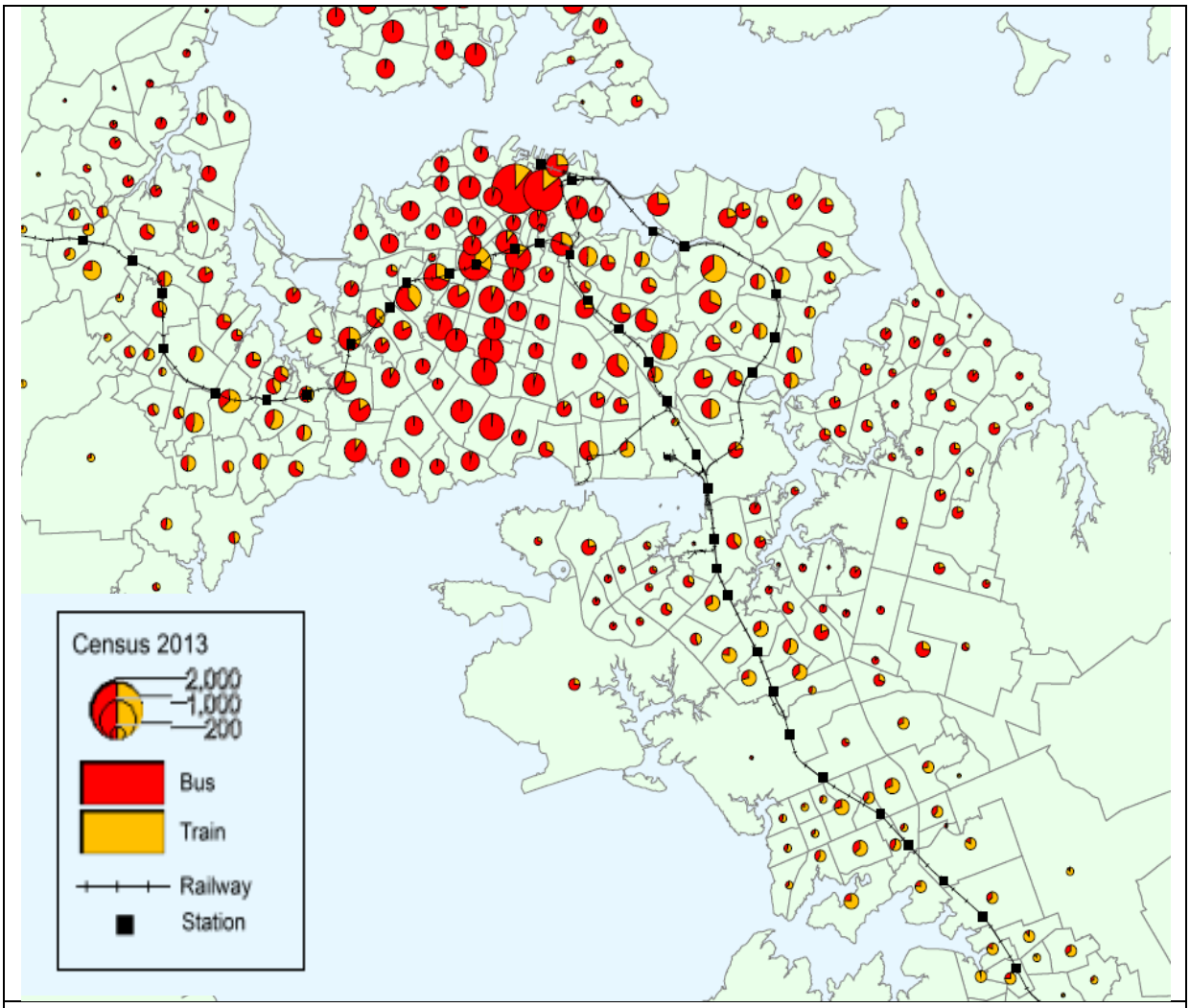


Figure 6.9
Choice between Road and Rail for Public Transport Commuting Trips 2013

Away from the CBD, areas located along the rail corridors typically have high rail shares and this share increases with distance away from the centre, especially in areas served by the Southern Line, although the numbers of movements tend to be very small. The relatively low numbers of bus trips from the Devonport area reflects the availability of ferry services (which are not specified separately but which are included in Other).

6.3.5 Active Mode Travel

The position for active mode commuters[6] is set out in Figure 6.10.

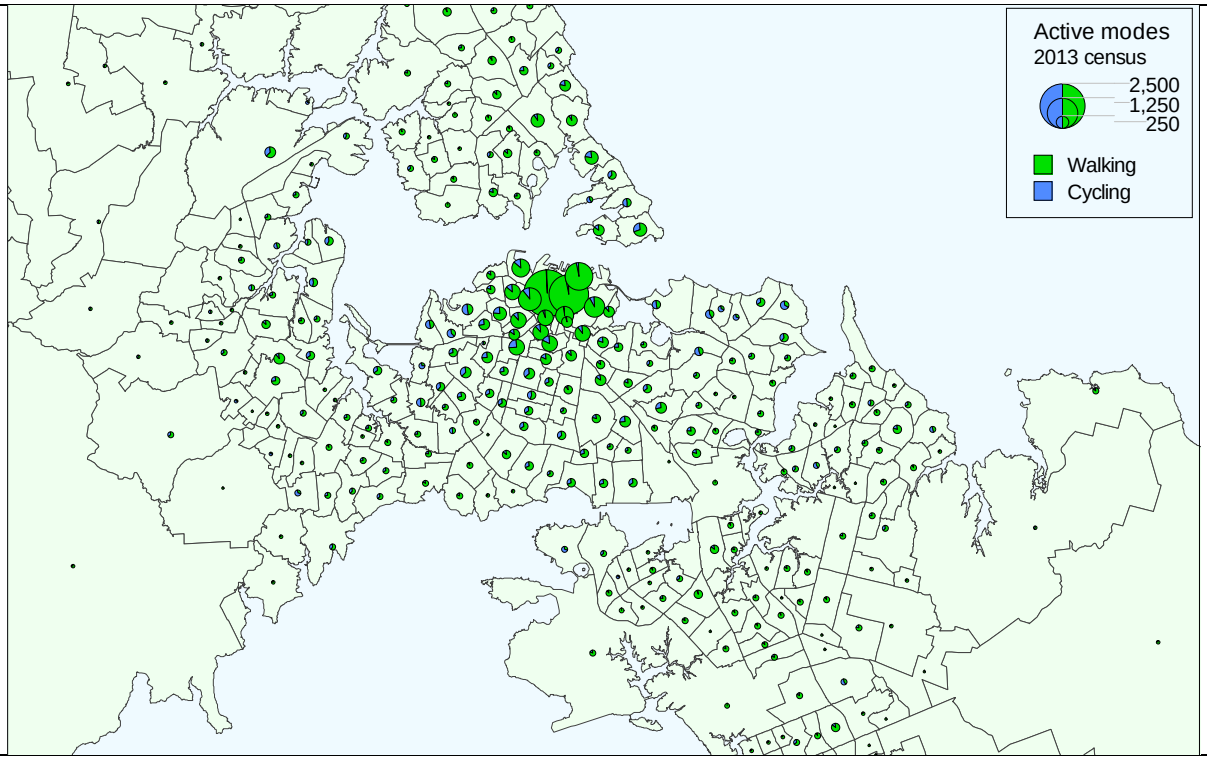


Figure 6.10
Active Modes by Origin 2013

High levels of active mode use are experienced in the CBD and generally decline as the distance from the centre increases. An exception to this is Middlemore where, as discussed above, average journey distances are small so providing good opportunities for the use of active modes.

[6] This covers commuters whose primary mode is recorded as one of the active modes rather than those who walk or cycle as part of a journey involving another mode.

6.3.6 Work at Home

The shares of work at home trips are set out in Figure 6.11.

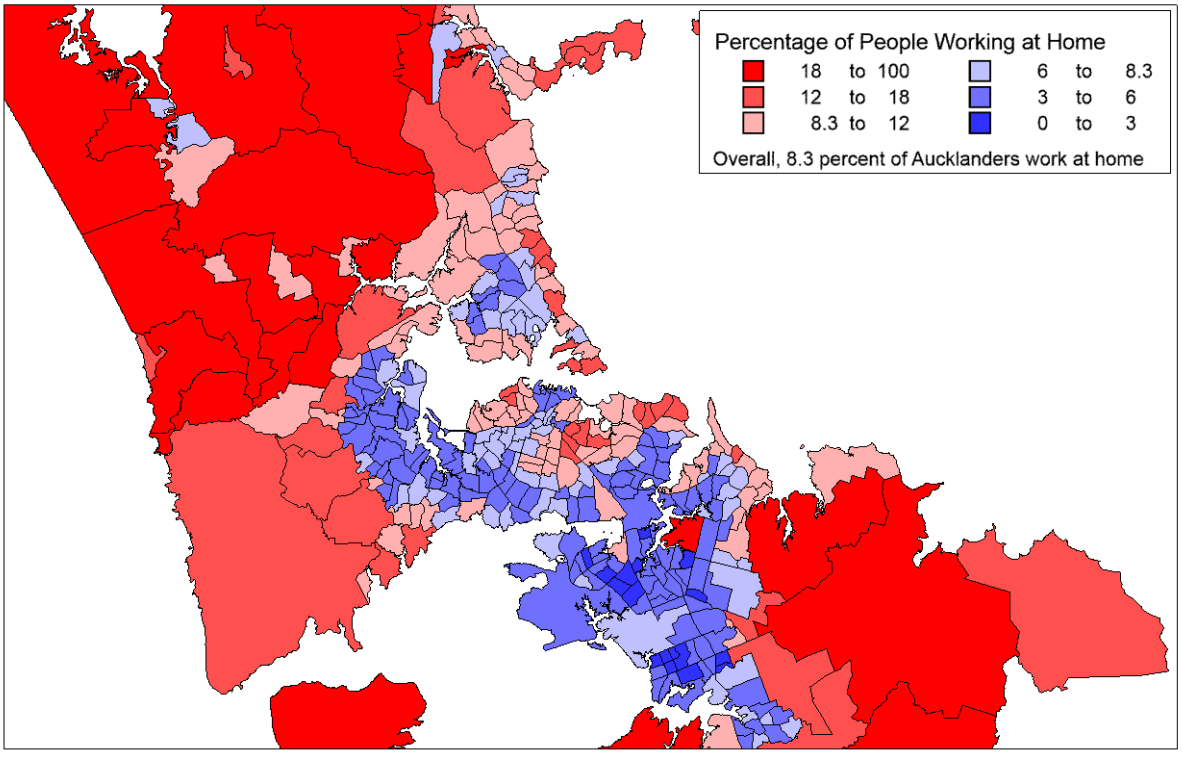


Figure 6.11
Per cent Work at Home 2013

The proportion of work at home trips is typically highest in the rural areas but is also relatively high along the coastal fringe in the North Shore and east of the CBD, which provide attractive locations for professionals and other self employed who may represent a high proportion of those working from home. Low work at home shares are recorded for a band connecting eastern Waitakere, the southern part of the Isthmus and down into Manukau and Papakura, which may be related to the socio-economic characteristics of the area.

6.4 Changes from 2006 in Public Transport Use

The changes in the shares of trips for train users between 2006 and 2013 are set out in Figure 6.12.

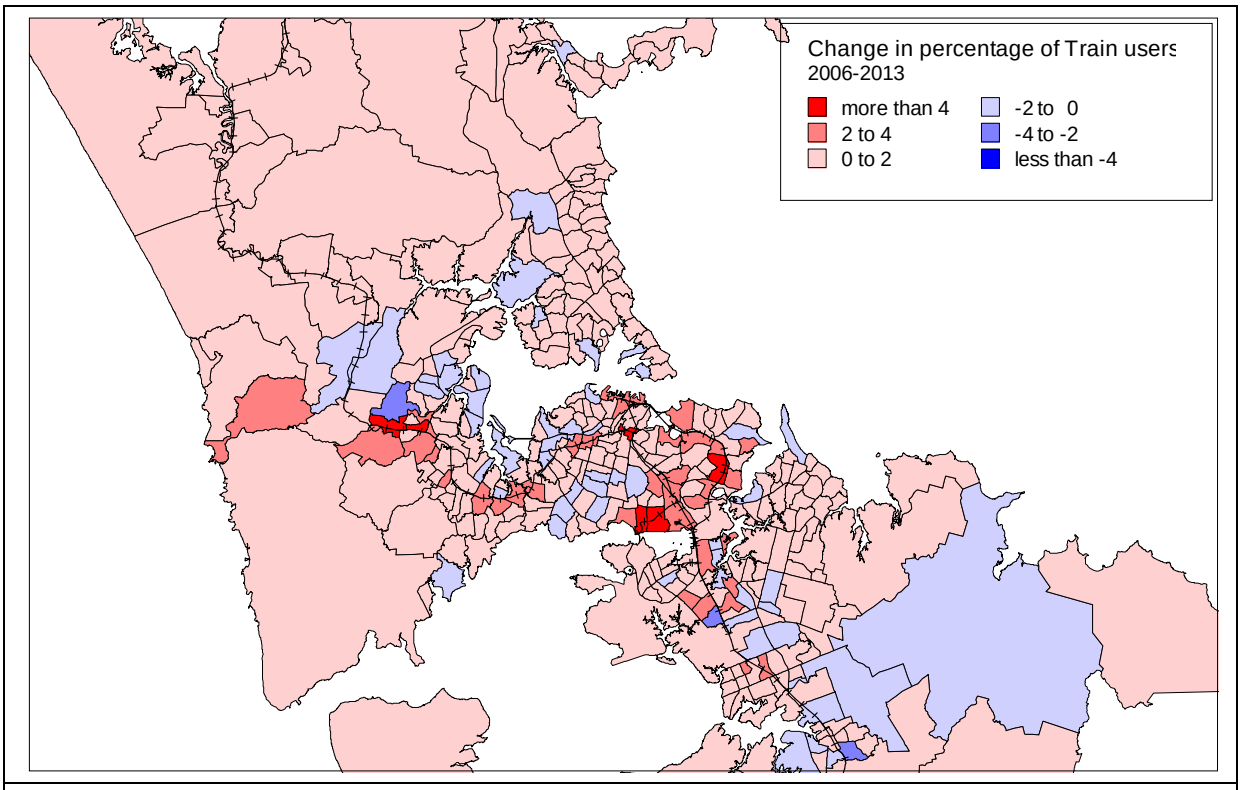


Figure 6.12
Changes in Rail Commuting by Origin 2006 - 2013

The figure shows clearly the extent of the change in train use along all the rail lines with a particularly large increase in the Onehunga/Penrose area reflecting the reopening of the Onehunga Line, in the Swanson area at the western end of the Western Line and at Panmure.

The change in bus travel is set out in Figure 6.13.

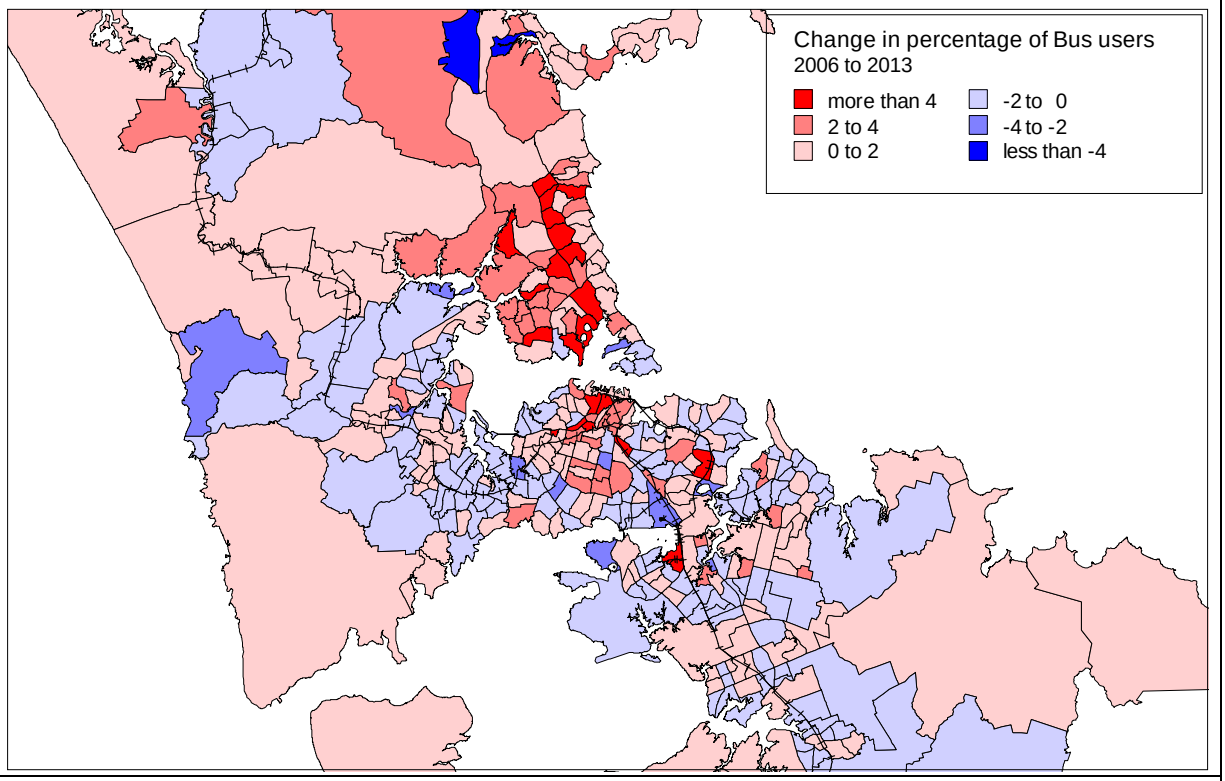


Figure 6.13
Bus Commuting 2006 and 2013

Between 2006 and 2013 there was particular intensification in bus use on the North Shore, both along the Northern Busway and also areas further west, and to a lesser extent along the Dominion Road/Mount Eden Road corridors in the Isthmus. There have also been some declines in the shares in bus use along the rail corridor and also more generally in many areas away from the Isthmus and North Shore.

7 Movement Patterns within Auckland – Selected Key Employment Centres

Key Findings

- Commuting journeys to the CBD are mainly from the Isthmus and to smaller extent from the southern part of the North Shore.
- Increases in trip making to the CBD between 2006 and 2013 have come from within the CBD itself and a number of locations distributed across the Region but without any clear patterns. There have, however, been decreases in trips from a number of areas, including those immediately to the west of the CBD and also to the south of the rail corridor west of Newmarket.
- The patterns of commuter trip making to a selection of other major employment centres across the Region have been examined.
- For most of these centres commuter trips are drawn from areas further away from the centre of the city and the degree of outbound commuting is limited.
- For these smaller centres there is only very limited commuting across the Waitemata Harbour - even for Takapuna which is reasonably accessible to the Harbour Bridge and the Devonport ferry.
- For these employment centres the share of private vehicle trips is typically higher than the regional average. To some extent this reflects the nature of employment in these areas and in many cases the lack of public transport services which are attractive to many workers.
- Bus use is high in Newmarket and Takapuna/Westlake which are served by major bus corridors.
- Rail use is higher than the regional average in Newmarket, Henderson and Ellerslie South which lie along the rail corridors, but is low in Onehunga/Penrose which also has a rail connection.
- Travel distances are also higher than the regional average for all areas but the difference is small for Newmarket.
- Between 2006 and 2013, the public transport share has increased at all the centres except Highbrook/East Tamaki, although in some instances the increase is very small.
- The private vehicle share has fallen at all centres except Highbrook/East Tamaki and the Airport. For these it has increased slightly to 94 per cent.

7.1 Introduction

As well as considering the Region as a whole, the position for selected key employment and residential areas has been considered. This has examined both the general pattern of trip making to or from the area and the modal splits of these journeys and how these have changed over time.

The areas considered in this way include:-

- The CBD
- Other major employment areas including:-
  - North Harbour (North Harbour East and Windsor Park CAUs)
  - Takapuna/Westlake
  - Henderson (Henderson North and Henderson South CAUs)
  - Newmarket

- Onehunga/Penrose (Penrose, Onehunga North West, Onehunga North East, Onehunga South West, Onehunga South East, Oranga and Te Papapa CAUs)
- Ellerslie South
- Highbrook/East Tamaki
- Manukau Central
- The Airport (Mangere South CAU)

7.2 CBD

The sources of workers to the CBD have been measured in terms of the propensity of workers residing in a zone to commute to the CBD (i.e. the share of the total workforce in a particular CAU which commutes to the CBD).

The propensity to travel to the CBD is set out in Figure 7.1.

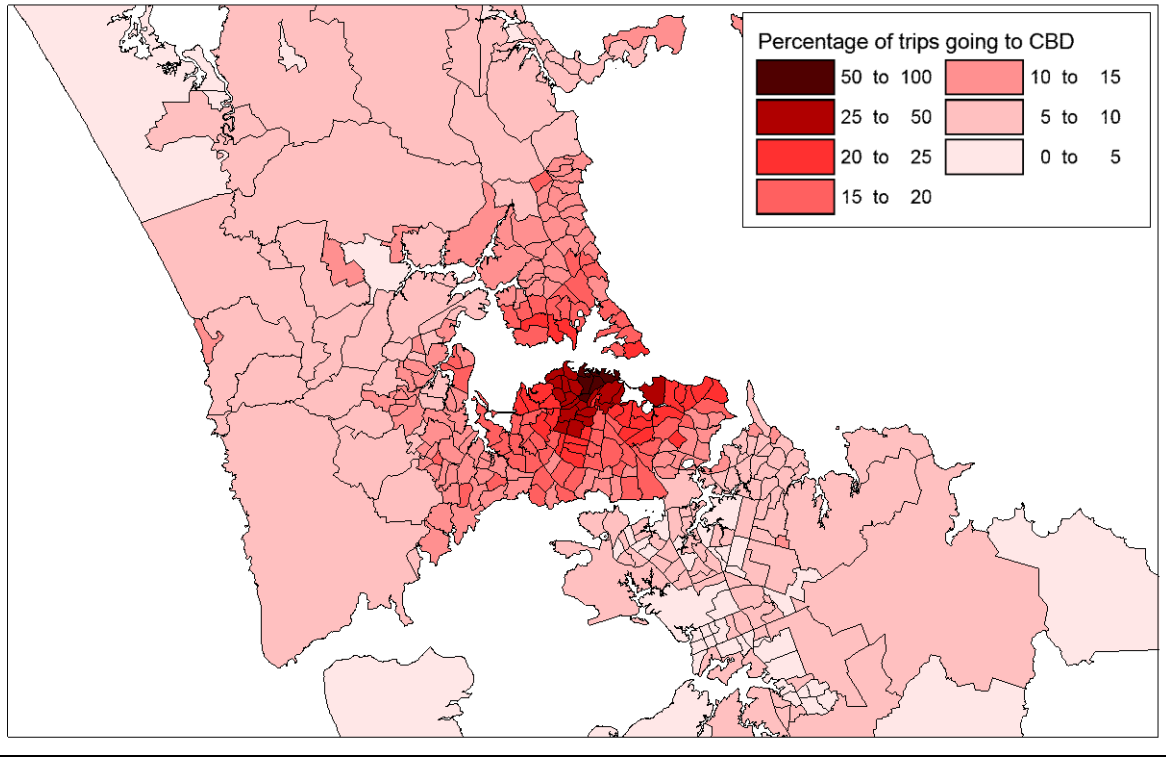


Figure 7.1
Share of Workers Commuting to the CBD by Origin 2013

The share of workers commuting to the CBD as a proportion of the total commuting trips from the area is highest within the CBD itself with a share of 45 per cent or more, and then declines in broadly concentric bands with a proportion of 25 per cent or more from a ring including the CBD fringe. It is noticeable that this ring excludes the North Shore possibly suggesting that the harbour acts as a perceived barrier to travel. Further afield there is an area which has a relatively high propensity to travel to the CBD which lies along the route of the Northern Busway and the Northern Motorway. Interestingly there appear to be no similar impacts along the lines of the Rapid Transit Network (RTN) or motorway south of the Manukau Harbour, although this may reflect the socio-economic characteristics of workers living to the south with lower proportions attracted to the types of jobs in the CBD.

The modal split for journeys to the CBD is set out in Figure 7.2.

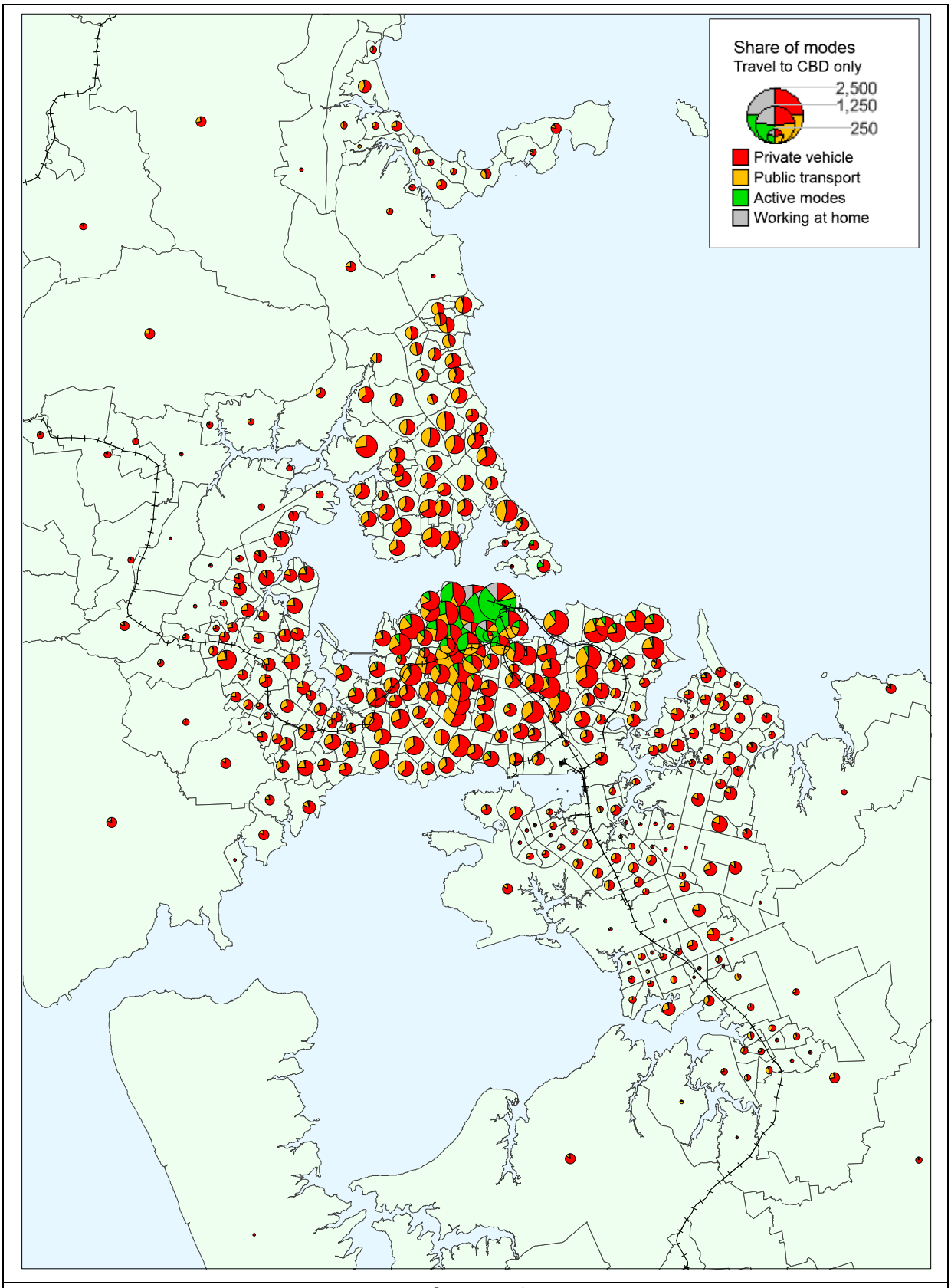


Figure 7.2
Modal Shares for Commuting Trips to the CBD 2013

There is a very high share of active trips for those travelling from origins within or very close to the CBD itself, and public transport use is also important for trips from within the Isthmus or the North Shore. However with increasing distance, the numbers commuting to the CBD decline and the share of private vehicle trips increases.

The change in commuting patterns to the CBD between 2006 and 2013 are set out in Figure 7.3.

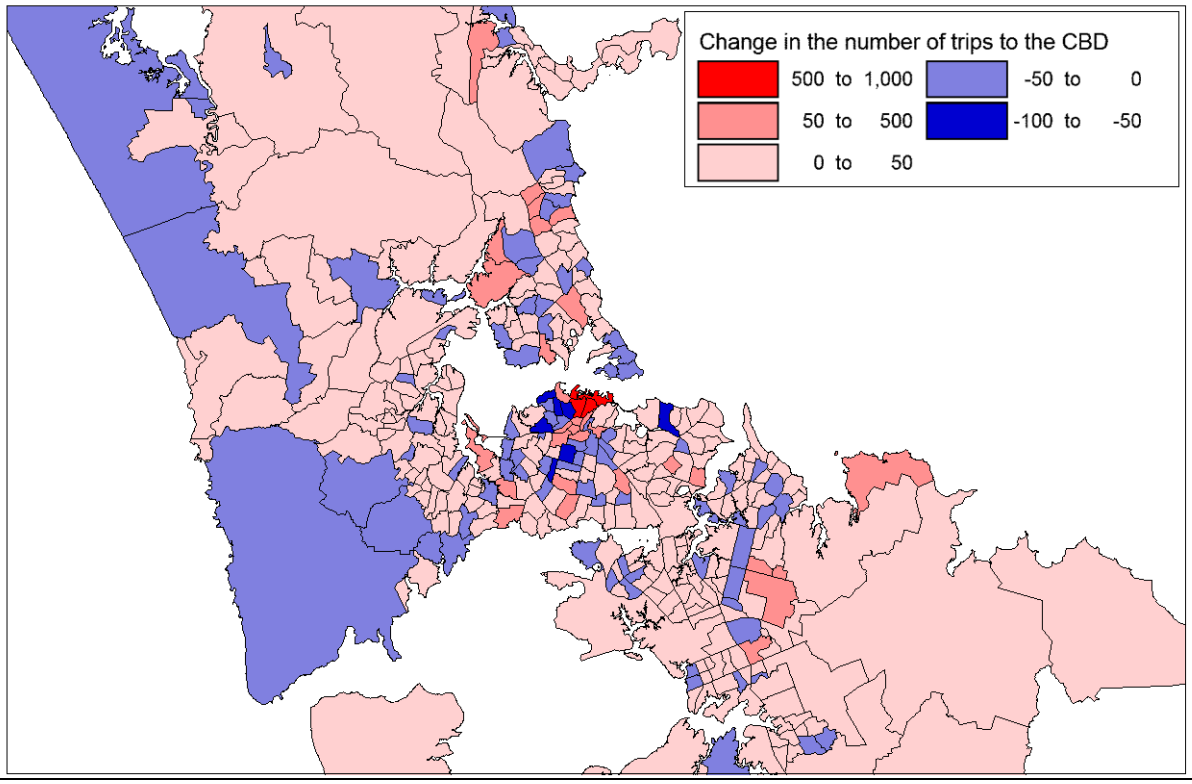


Figure 7.3
Change in trips to CBD by CAU 2006-2013

The areas where the numbers of trips to the CBD have increased the most substantially are within the CBD itself where trips from the three major CAUs in the north of the CBD have each increased by 500 trips or more. There are increases of 50 trips or more from a number of CAUs primarily in the Isthmus including the area from Newmarket to Kingsland identified above as having a high public transport share (Figure 6.8) and on the North Shore, from areas served by the Northern Busway and Northern Motorway. However there have also been decreases in the numbers of trips from a band immediately to the east of the CBD, further south across the centre of the Isthmus and from Devonport and the areas immediately to the north. The limited increase in trip making into the CBD from the Other Central sector has already been identified above.

This position is also explored in Figure 7.4 which sets out changes the shares of workers to the CBD between 2006 and 2013. The blue area in the figure indicates areas where the share of the resident workers commuting to the CBD as a proportion of the total for the CAU has declined even though in some cases the total number of CBD trips has increased. This interestingly includes much of the CBD itself as well as wide areas in the Isthmus to the west and south.

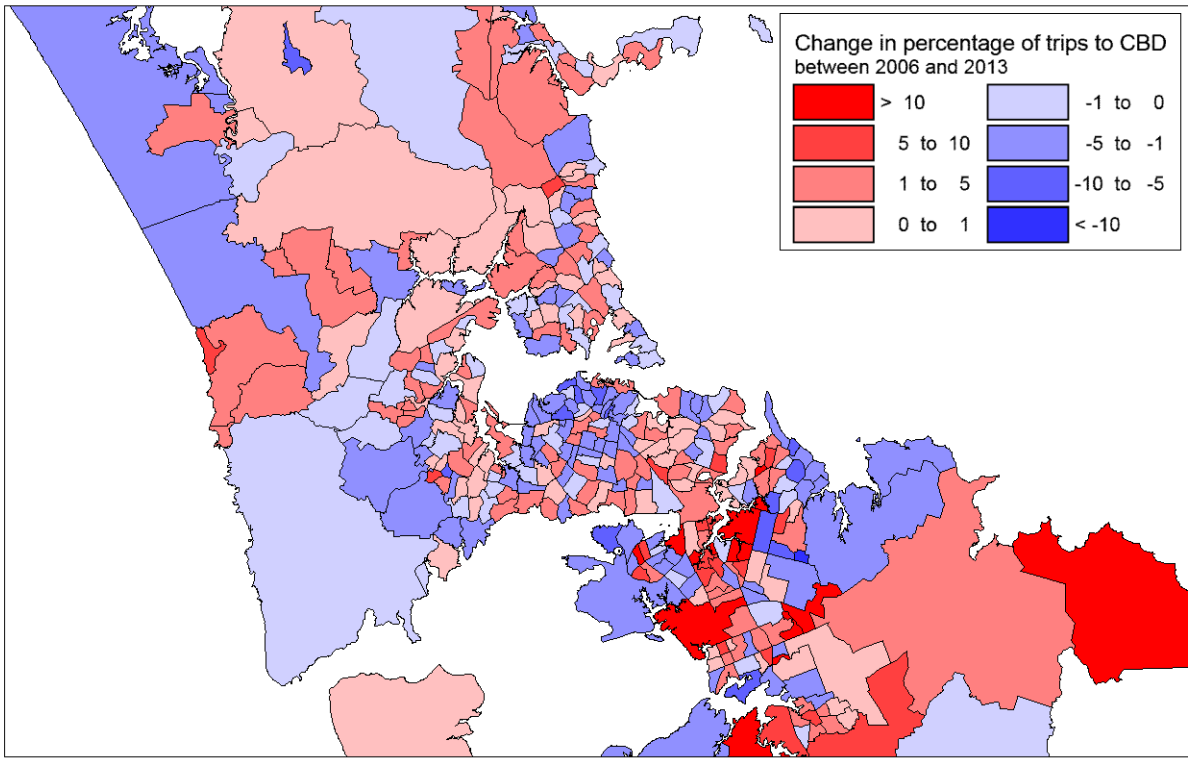


Figure 7.4
Change in CBD Trip Propensity by CAU 2006-2013

The position displayed in Figure 7.4 presents no clear patterns of change to the CBD with, in general, areas of increases in the shares of workers adjacent to areas of decrease. The only areas where increases coincide with infrastructure improvements is in the corridor between Mt Wellington and Manurewa, which is served by an improved rail service, but in other areas these improvements appear to have little systematic impact on the shares of workers to the CBD.

7.3 Employment Centres away from the CBD

7.3.1 Introduction

The travel patterns for a number of important but smaller employment centres within the Region have been examined. These centres comprise:-

- North Harbour
- Takapuna/Westlake
- Henderson
- Newmarket
- Onehunga/Penrose
- Ellerslie South
- Highbrook/East Tamaki
- Manukau Central
- The Airport

The patterns have been measured by looking at the proportions of workers in each CAU which commute to the particular centres identified.

7.3.2 North Harbour

The North Harbour estate (the CAUs of North Harbour East and Windsor Park) is a relatively large employment area with almost 18,000 workers recorded commuting into it. The propensity for commuting (the share of workers as a proportion of the total resident workforce for each CAU) into the area in 2013 is set out in Figure 7.5.

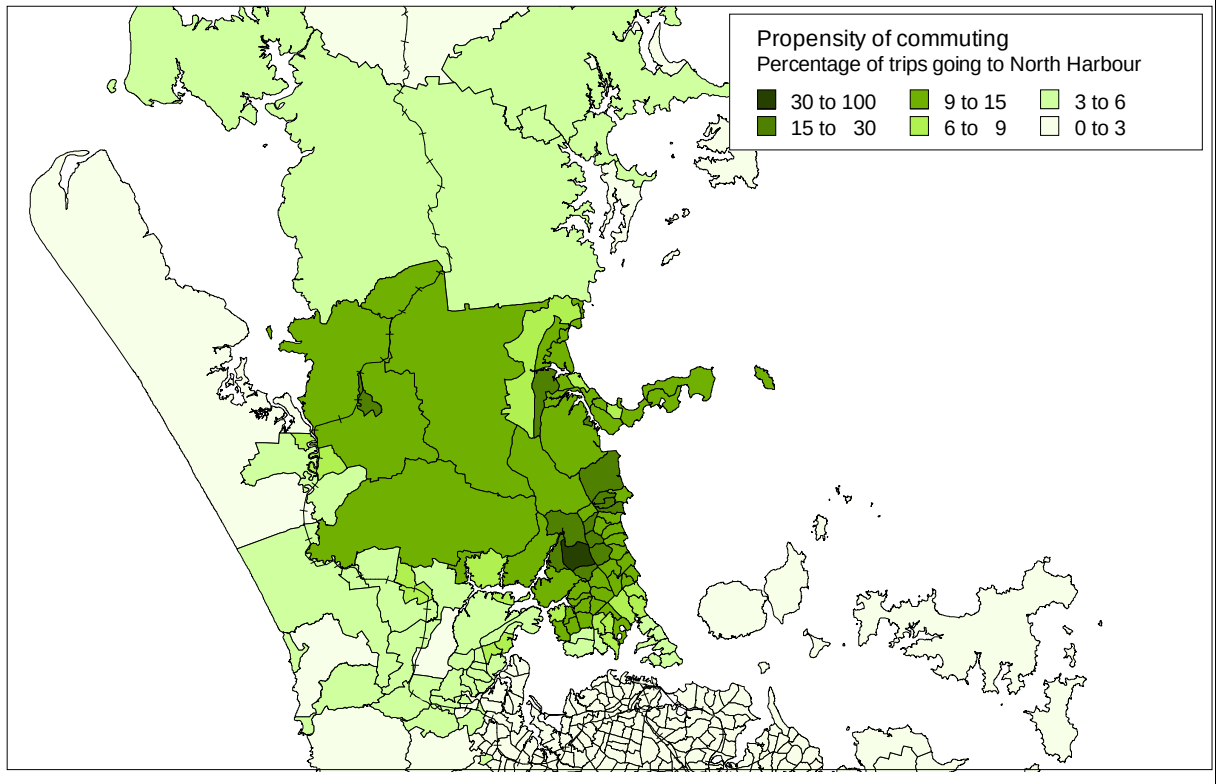


Figure 7.5
Propensity of Commuting to North Harbour 2013

For the North Harbour estate, commuting is mainly from areas to the north and west and a limited band to the south. Longer distance commuting flows from the south and south-west in the direction away from the central area are relatively small.

The modal split for commuting journeys into North Harbour is set out in Table 7.1.

Table 7.1
Modal Splits for Trips to Workplaces in North Harbour

Mode	North Harbour		Regional Average Modal Share
	Trips	Modal Share	
Private vehicle	16,272	92.0%	75.0%
Bus	411	2.3%	6.0%
Train	9	0.1%	1.7%
Walked or jogged	252	1.4%	4.6%
Bicycle	114	0.6%	1.1%
Other	333	1.9%	3.3%
Worked at home	288	1.6%	8.3%
Total	**17,679**	**100%**	**100%**

Trip making into the area is characterised by very high private vehicle use and low public transport and active mode use.

The average trip distance is 15.7 kms, about 35 per cent higher than the regional average of 11.8 kms. This is a reflection of the relatively large catchment area, particularly to the north of the Estate.

7.3.3 Takapuna/Westlake

The Takapuna/Westlake area is a moderate sized employment centre with about 15,000 workers recorded as commuting into it. The propensity for commuting in 2013 is set out in Figure 7.5.

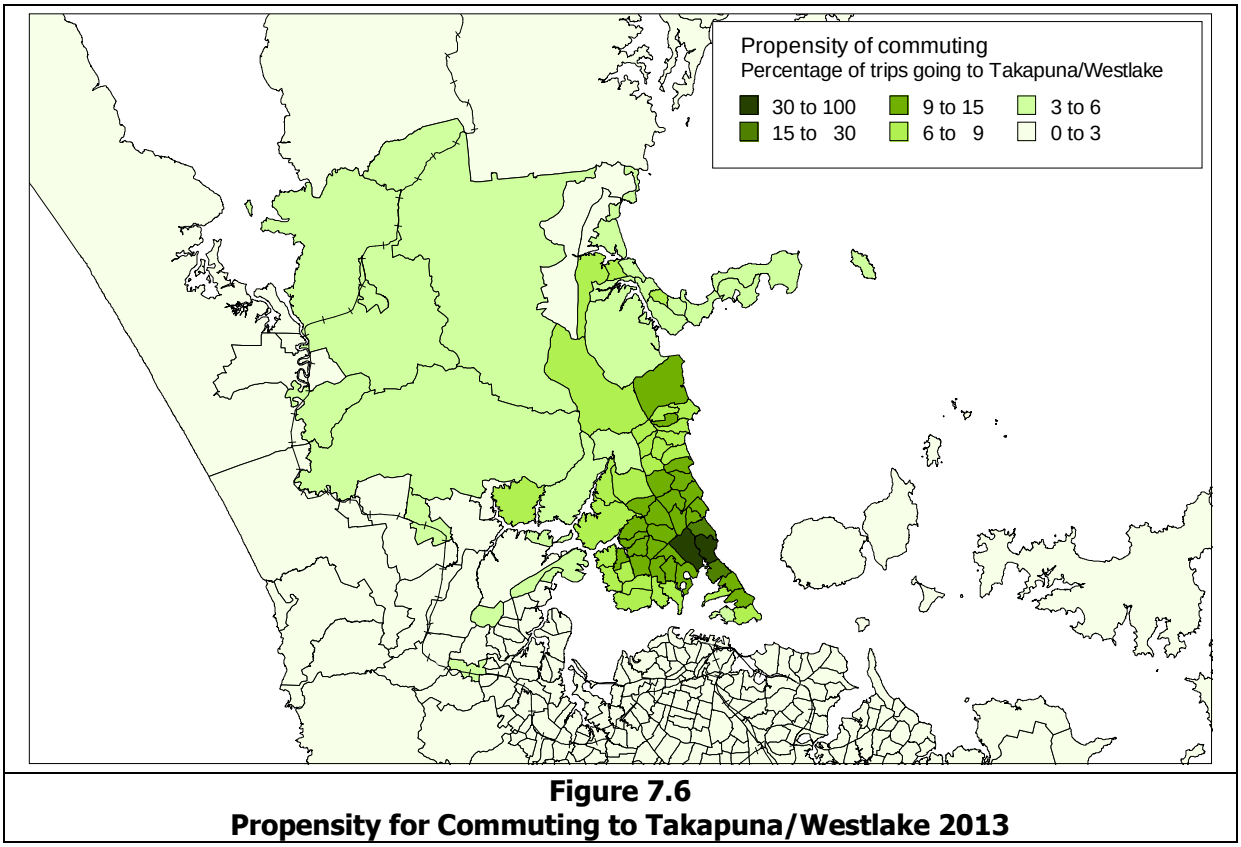


Figure 7.6
Propensity for Commuting to Takapuna/Westlake 2013

The area has a fairly large catchment area mainly to the north but with relatively few trips from south of the harbour or from the west.

The modal split for commuting journeys into Takapuna/Westlake is set out in Table 7.4.

Table 7.2
Modal Splits for Trips to Workplaces in Takapuna/Westlake

Mode	Takapuna/Westlake		Regional Average Modal Share
	Trips	Modal Share	
Private vehicle	12,402	83.1%	75.0%
Bus	1,197	6.6%	6.0%
Train	48	0.1%	1.7%
Walked or jogged	690	4.2%	4.6%
Bicycle	213	1.0%	1.1%
Other	300	2.6%	3.3%
Worked at home	399	2.5%	8.3%
Total	**15,249**	**100%**	**100%**

The area has a relatively high private vehicle share of commuting trips and also has a bus share that is higher than the regional average reflecting in part the Northern Busway which directly serves parts of the area, particularly Westlake and Smales Farm. The share of active mode trips is slightly below with the regional average.

The average trip length for commuting trips to the area is 12.9 kms, about 10 per cent higher than the regional average.

7.3.4 Henderson

Henderson (Henderson North and Henderson South CAUs) is a fairly small employment centre with about 7,000 workers recorded as commuting into it. The propensity for commuting from the surrounding areas in 2013 is set out in Figure 7.7.

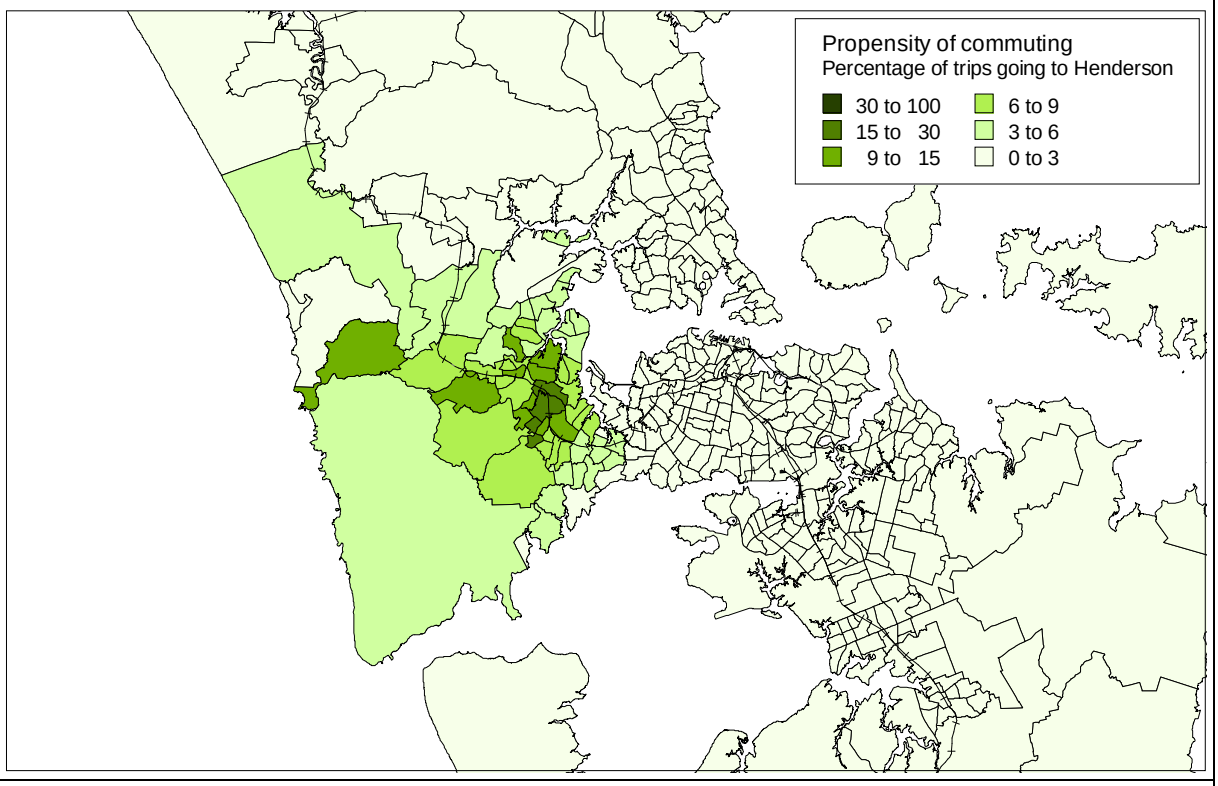


Figure 7.7
Propensity for Commuting to Henderson 2013

The area has a strong catchment area to the west but relatively little trip making from the east.

The modal split for commuting journeys into Henderson is set out in Table 7.3.

Table 7.3
Modal Splits for Trips to Workplaces in Henderson

Mode	Henderson		Regional Average Modal Share
	Trips	Modal Share	
Private vehicle	5,934	83.7%	75.0%
Bus	222	3.1%	6.0%
Train	198	2.8%	1.7%
Walked or jogged	225	3.2%	4.6%
Bicycle	108	1.5%	1.1%
Other	219	3.1%	3.3%
Worked at home	186	2.6%	8.3%
Total	**7,092**	**100%**	**100%**

The area has a relatively high private vehicle share of commuting trips. It also has a rail share that is higher than the regional average reflecting its location on the Western Line, although the bus share is low and the overall public transport share at 5.9 per cent is below the regional average of 7.7 per cent. The share of active mode trips is below the regional average although the share of cycling trips is higher.

The average trip length for commuting trips to the area is 12.8 kms, about 8 per cent higher than the regional average.

7.3.5 Newmarket

Newmarket is a moderate sized employment centre with about 9,000 workers recorded as travelling to work into it in 2013. The propensity for commuting from the surrounding areas is set out in Figure 7.8.

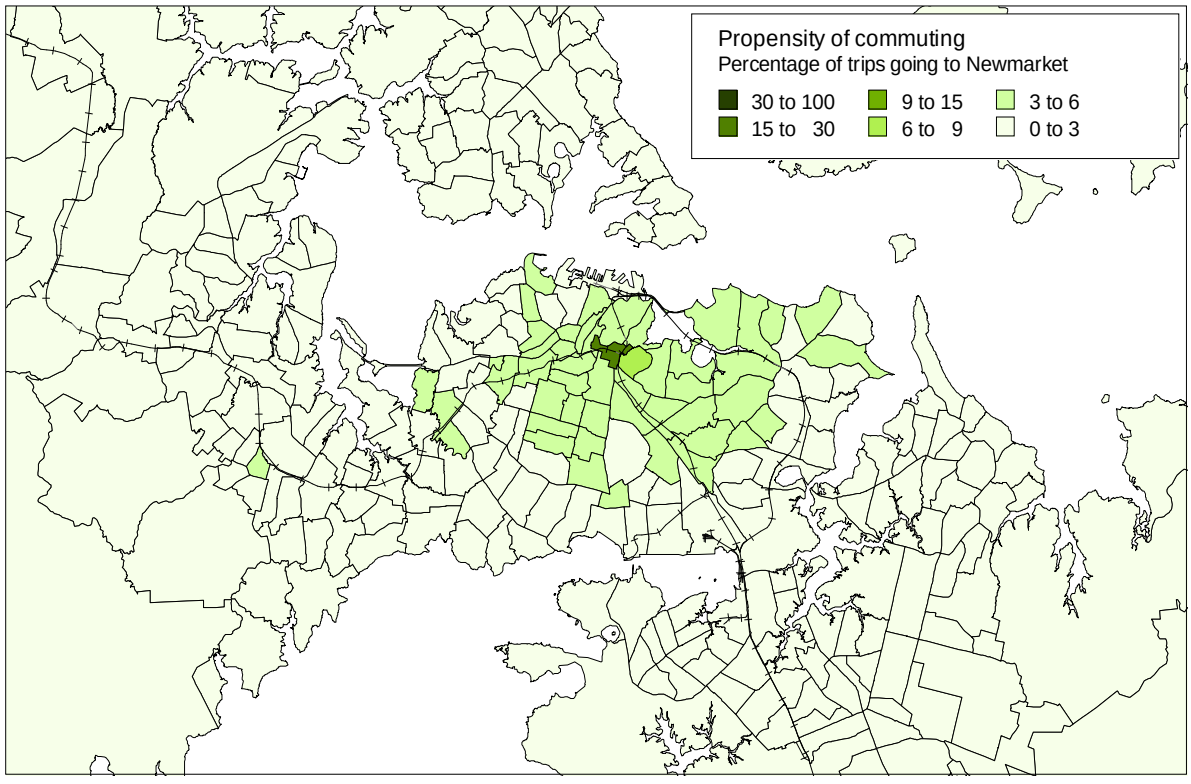


Figure 7.8
Propensity of Trip Making to Newmarket 2013

The commuting trips to Newmarket are from a fairly concentrated area especially along the Great South Road and Manukau Road corridors. Further afield there is also a degree of commuting into the area on an east-west axis, particularly from the east, but few trips from across the harbour or from areas to the east or south of the Isthmus.

The modal split for commuting journeys into Newmarket is set out in Table 7.4.

Table 7.4
Newmarket : Modal Splits for Trips to Workplaces

Mode	Newmarket		Regional Average Modal Share
	Trips	Modal Share	
Private vehicle	6,534	70.1%	75.0%
Bus	1035	11.1%	6.0%
Train	555	6.0%	1.7%
Walked or jogged	591	6.3%	4.6%
Bicycle	189	2.0%	1.1%
Other	279	3.0%	3.3%
Worked at home	132	1.4%	8.3%
Total	**9,315**	**100%**	**100%**

Compared to the position for the Region as a whole, Newmarket has a slightly lower share of car travel and high shares of bus and train travel. This reflects its position on a large number of bus routes and on the Southern and Western Rail Lines. It also has shares for active modes which are higher than the regional average. The work at home share is relatively low.

The average trip length for commuting trips to Newmarket at 12.1 kms is slightly higher than the regional average of 11.8, although compared to the other selected employment centres (see Table 7.10 below) this figure is relatively low, possibly reflecting the higher shares of active trips and movements by bus.

7.3.6 Onehunga/Penrose

Onehunga/Penrose is a major employment area with almost 20,000 workers recorded as commuting to it. The propensity for commuting into the area in 2013 is set out in Figure 7.9.

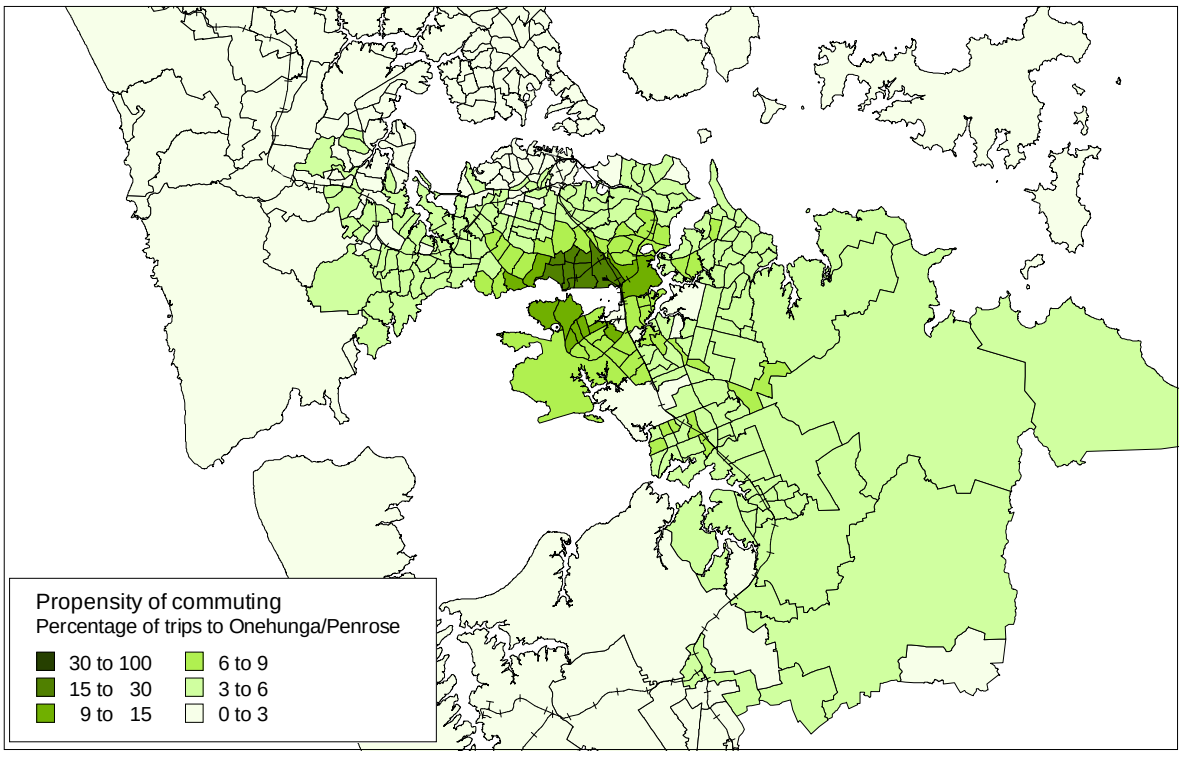


Figure 7.9
Propensity of Trip Making to Onehunga/Penrose 2013

Because of the high level of employment in the area, workers are drawn from wide areas of the Region. There is a particular concentration from workers living either just to the north of the Mangere Inlet in a band stretching from Hillsborough to Mt Wellington or to the south of the Inlet, and more generally to the south and east including Otahuhu and Manurewa. There is relatively little commuting from the northern parts of the Isthmus, and the North Shore.

The modal split for commuting journeys into Onehunga/Penrose is set out in Table 7.5.

Table 7.5
Modal Splits for Trips to Workplaces in Onehunga/Penrose

Mode	Onehunga/Penrose		Regional Average Modal Share
	Trips	Modal Share	
Private vehicle	17,124	86.7%	75.0%
Bus	669	3.4%	6.0%
Train	243	1.2%	1.7%
Walked or jogged	444	2.2%	4.6%
Bicycle	189	1.0%	1.1%
Other	504	2.6%	3.3%
Worked at home	588	3.0%	8.3%
Total	**19,761**	**100%**	**100%**

Compared to the position for the Region as a whole, Onehunga/Penrose as an employment area has a high share of private transport movements and low shares of both bus and train users, despite the reinstatement of rail services to Onehunga. There are also low shares of active mode trips although the share for bicycle is only just below the regional average.

The high share of private transport trips reflects the nature of the employment in the area with frequent shift working at times when public transport services are not available or, at best, limited. Much of the employment is also remote from public transport routes and there is also substantial car parking available in the area.

The average trip length for commuting journeys to the area is 13.9 kms about 15 to 20 per cent longer than the regional average. This in part reflects its location bounded by the Inlet which increases the journey distances of those travelling from the south and the high share of private vehicle trips which typically have longer trip lengths.

7.3.7 Ellerslie South

Although relatively small with about 7,300 commuting trip destinations in 2013, a similar size to Henderson, Ellerslie South is a rapidly growing centre in the southern Auckland Isthmus. According to BDD[7] figures, employment here has increased by almost a quarter between 2006 and 2013, compared to regional growth of about 5 per cent over the same period. The propensity for commuting into Ellerslie South in 2013 is set out in Figure 7.10.

[7] Business Demographics Database published by Statistics NZ

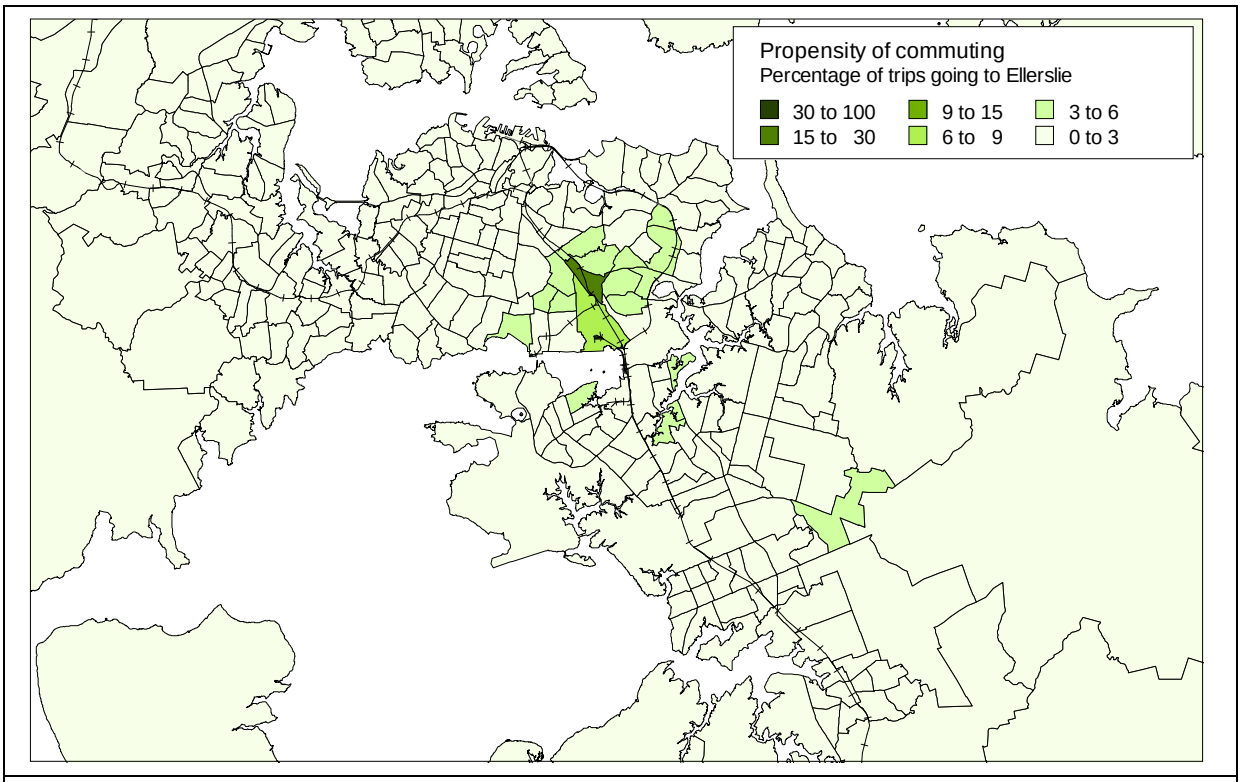


Figure 7.10
Propensity of Trip Making to Ellerslie South 2013

Ellerslie South as a relatively small employment zone has a limited focussed catchment area where it attracts high proportions of the total workers in a CAU. This catchment area mainly covers the immediately surrounding areas and also areas slightly further to the north-east. Despite its position next to the rail and motorway corridors, there is little evidence of significant volumes of the longer distance commuting that would be facilitated by these.

The modal split for commuting journeys into Ellerslie South is set out in Table 7.6.

Table 7.6
Ellerslie South : Modal Splits for Trips to Workplaces

Mode	Ellerslie South		Regional Average Modal Share
	Trips	Modal Share	
Private vehicle	6,207	84.8%	75.0%
Bus	291	4.0%	6.0%
Train	276	3.8%	1.7%
Walked or jogged	216	3.0%	4.6%
Bicycle	60	0.8%	1.1%
Other	189	2.6%	3.3%
Worked at home	81	1.1%	8.3%
Total	**7,320**	**100%**	**100%**

Compared to the regional position, Ellerslie South has a high proportion of private vehicle trips and also a high proportion of commuting by train, reflecting its position on the Southern Line and on the junction with the Onehunga Branch Line. In part this is balanced by a relatively low share of bus trips with a total public transport share that is in line with the regional average. The share of work at home trips is very low.

The average trip length for commuting journeys to the area is 13.5 kms about 15 per cent longer than the regional average of 11.8 kms.

7.3.8 Highbrook/East Tamaki

Highbrook/East Tamaki (comprising the CAUs of Highbrook and Greenmount) is a major employment area attracting almost 17,000 commuting trips in 2013. The propensity for commuting into the area in 2013 is set out in Figure 7.11.

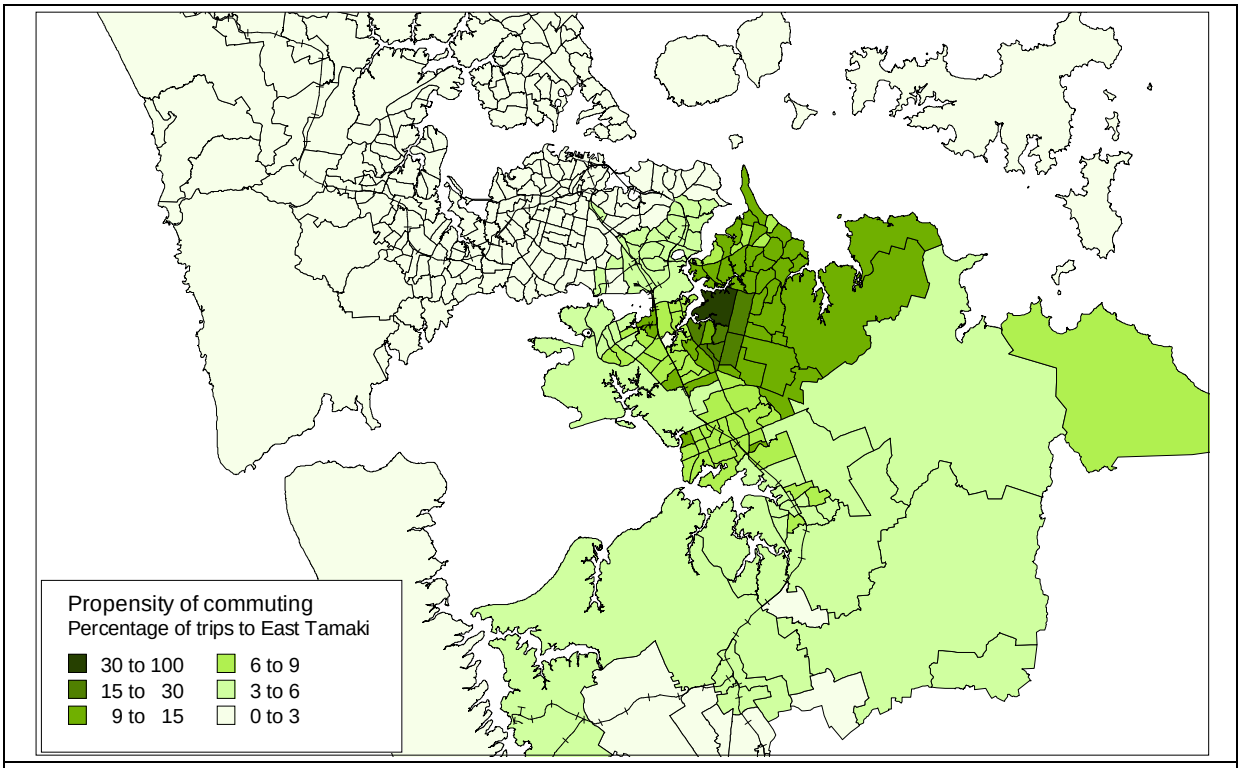


Figure 7.11
Propensity of Trip Making to Highbrook 2013

Highbrook/East Tamaki draws workers from a wide area particularly from the north and east although with relatively few trips from the Isthmus and only limited trips from the areas immediately to the west.

The modal split for commuting journeys into Highbrook/East Tamaki is set out in Table 7.8.

Table 7.7
Modal Splits for Trips to Workplaces in Highbrook/East Tamaki

Mode	Highbrook/East Tamaki		Regional Average Modal Share
	Trips	Modal Share	
Private vehicle	15,672	93.8%	75.0%
Bus	171	1.0%	6.0%
Train	15	0.1%	1.7%
Walked or jogged	126	0.8%	4.6%
Bicycle	171	1.0%	1.1%
Other	399	2.4%	3.3%
Worked at home	162	1.0%	8.3%
Total	**16,716**	**100%**	**100%**

Commuters into the area have a particularly high private vehicle share of about 94 per cent substantially above the regional average of 75 per cent. The public transport share is very small at just over 1 per cent compared to the regional average of 7.7 per cent. In part this reflects the dispersed nature of the employment in the area with many workplaces being at a substantial distance from the main roads in the area, in part the nature of employment with substantial numbers working shifts requiring travel when public transport services are limited or non-existent, and in part the ready availability of car parking.

The average distance for journeys to the area is 14.1 kms, about 20 per cent higher than the regional average. This reflects the wide catchment area from which commuting to the area is drawn, the high proportion of private vehicle trips for which trip lengths tend to be relatively long, and the low share of active mode journeys.

7.3.9 Manukau Central

Manukau Central is a moderate sized employment centre with about 10,000 trips recorded as commuting to the area in 2013. The propensity for commuting is set out in Figure 7.12.

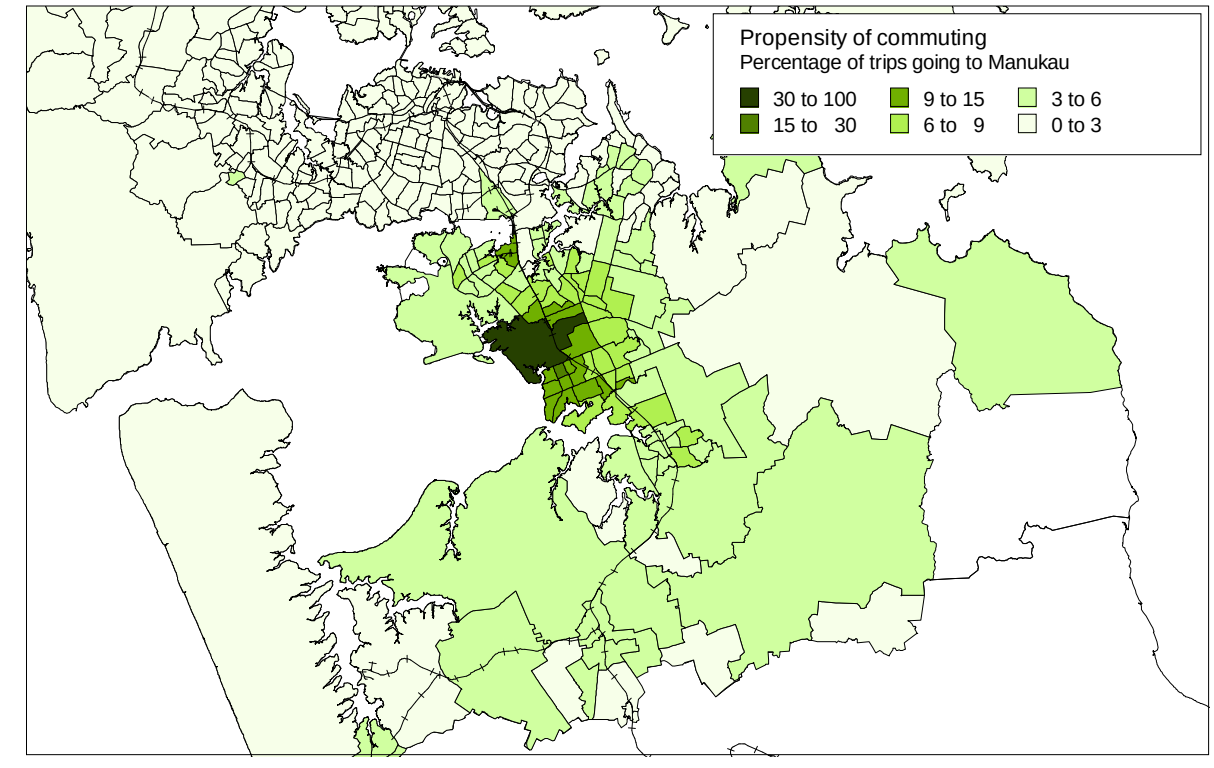


Figure 7.12
Propensity of Trip Making to Manukau Central 2013

The area attracts a high proportion of trips from itself and from the areas immediately to the east and south. There is little trip making from areas to the north of the Mangere Inlet and from the Isthmus in general but more substantial trip making from the south along the north-south transport corridor.

The modal share of trips to Manukau Central is set out in Table 7.8.

Table 7.8
Modal Splits for Trips to Workplaces in Manukau Central :

Mode	Newmarket		Regional Average Modal Share
	Trips	Modal Share	
Private vehicle	9,312	91.1%	75.0%
Bus	216	2.1%	6.0%
Train	93	0.9%	1.7%
Walked or jogged	132	1.3%	4.6%
Bicycle	57	0.6%	1.1%
Other	339	3.3%	3.3%
Worked at home	72	0.7%	8.3%
Total	**10,221**	**100%**	**100%**

The area has a particularly high share of private vehicle trips at over 90 per cent compared with a regional average of 75 per cent. The rail share is low despite the opening of the Manukau Rail Link which provides access to the area, and there are also low shares for bus, active modes and working at home. The high private vehicle share probably reflects the socio-economic characteristics of the area and the types of jobs available, which in many cases are not conveniently served by public transport.

The average trip distance for those with jobs in Manukau Central is 15.4 kms. This is relatively high in relation to the regional average of 11.8 kms. This reflects the relatively high share of trips travelling some distance from the east and south which is probably in turn reflected in the high share of private vehicle trips.

7.3.10 Airport and Environs

The Airport and Environs (Mangere South CAU) is a large employment area with more than 13,000 commuting journeys recorded in 2013. The propensity for commuting to the area is set out in Figure 7.13.

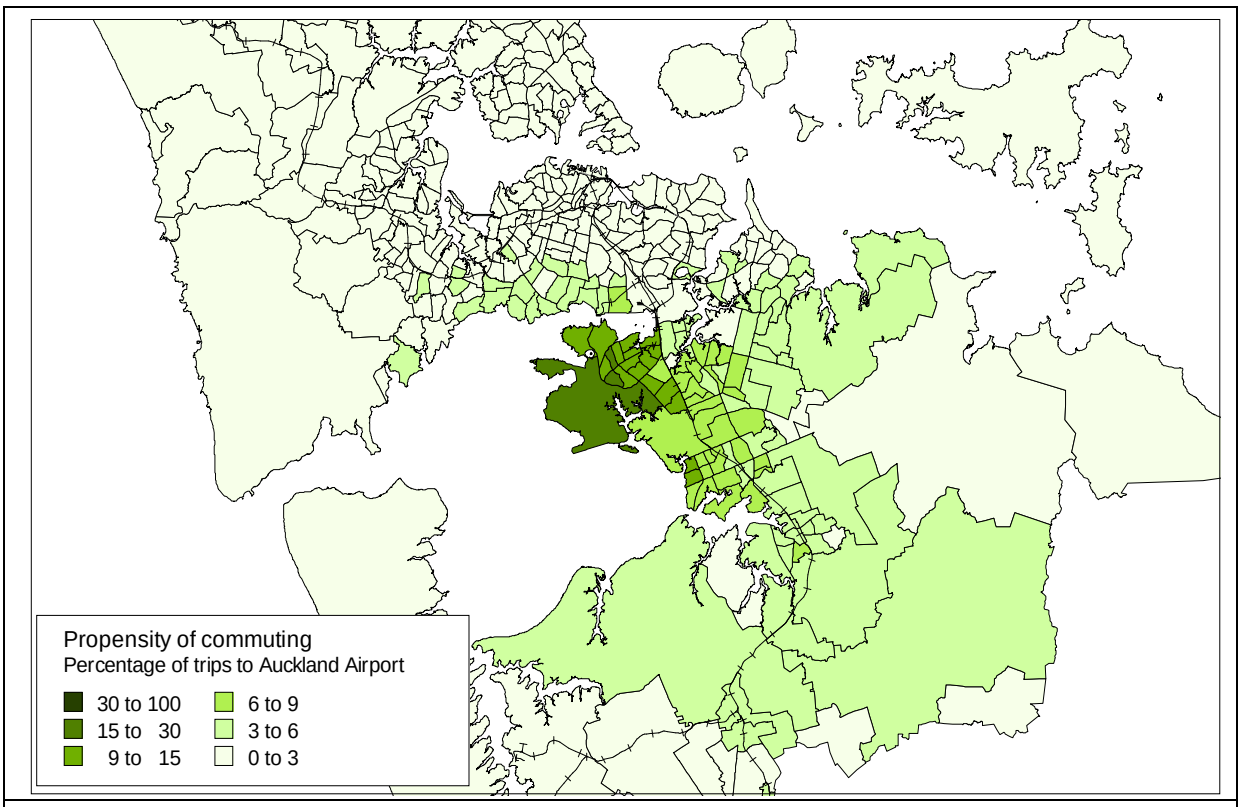


Figure 7.13
Propensity of Trip Making to the Airport and Environs 2013

The Airport area attracts workers from a wide area particularly to the east and south and also from limited areas to the north of the Manukau Harbour.

The modal share of trips to the Airport and Environs is set out in Table 7.9.

Table 7.9
Modal Splits for Trips to Workplaces in Airport and Environs

Mode	Airport and Environs		Regional Average Modal Share
	Trips	Modal Share	
Private vehicle	12,264	92.6%	75.0%
Bus	219	1.7%	6.0%
Train	36	0.3%	1.7%
Walked or jogged	87	0.7%	4.6%
Bicycle	81	0.6%	1.1%
Other	411	3.1%	3.3%
Worked at home	141	1.1%	8.3%
Total	**13,239**	**100%**	**100%**

As in the case of Highbrook, the area has a very high share of trips by private vehicles which account for almost 93 per cent of all commuting trips. The public transport share is low at about 2 per cent, reflecting the limited services offered and the nature and geographical distribution of employment in the area with a high proportion of shift working and the dispersed nature of the sites away from public transport routes. There are also relatively small numbers of active mode trips, again reflecting the size of the area and the remoteness of much of the employment from residential areas.

The average trip distance is 18.1 kms, substantially above the regional average. Again, this reflects the wide area from which workers are drawn and the size of the area itself which means that even journeys from neighbouring locations are relatively long.

7.3.11 Summary of Characteristics of Other Employment centres

Some of the key characteristics of the employment centres considered are set out in Table 7.10 and in Figure 7.14 - Figure 7.16.

Table 7.10
Summary of Characteristics of Trips to Selected Employment areas

	North Harbour	Takapuna/ Westlake	Hender -son	New- market	Onehunga/ Penrose	Ellerslie South	Highbrook/ East Tamaki	Manukau Central	Airport & Environs	Region average
Total commuting destinations	17,679	15,249	7,092	9,315	19,761	7,320	16,716	10,221	13,239	
Modal Splits										
Private vehicle	92.0%	81.3%	83.7%	70.1%	86.7%	84.8%	93.8%	91.1%	92.6%	75.0%
Bus	2.3%	7.8%	3.1%	11.1%	3.4%	4.0%	1.0%	2.1%	1.7%	6.0%
Train	0.1%	0.3%	2.8%	6.0%	1.2%	3.8%	0.1%	0.9%	0.3%	1.7%
Walked or jogged	1.4%	4.5%	3.2%	6.3%	2.2%	3.0%	0.8%	1.3%	0.7%	4.6%
Bicycle	0.6%	1.4%	1.5%	2.0%	1.0%	0.8%	1.0%	0.6%	0.6%	1.1%
Other	1.9%	2.0%	3.1%	3.0%	2.6%	2.6%	2.4%	3.3%	3.1%	3.3%
Work at home	1.6%	2.6%	2.6%	1.4%	3.0%	1.1%	1.0%	0.7%	1.1%	8.3%
Average travel distance (kms)	**15.7**	**12.9**	**12.8**	**12.1**	**13.9**	**13.5**	**14.1**	**15.4**	**18.1**	**11.8**

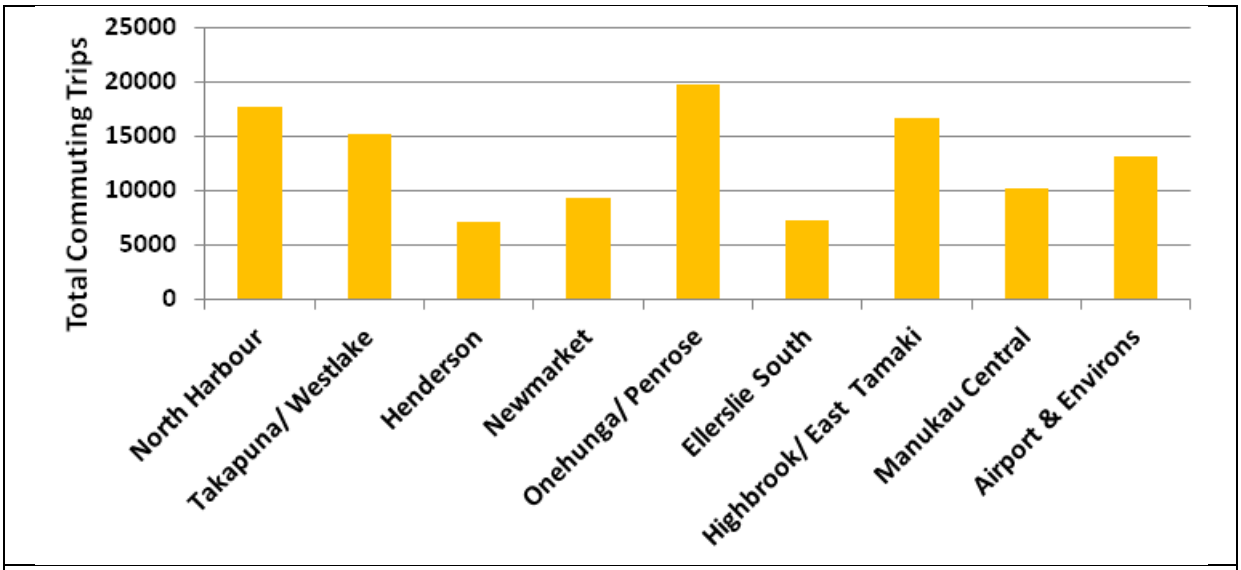


Figure 7.14
Total Commuting Trips to Selected Employment Areas :

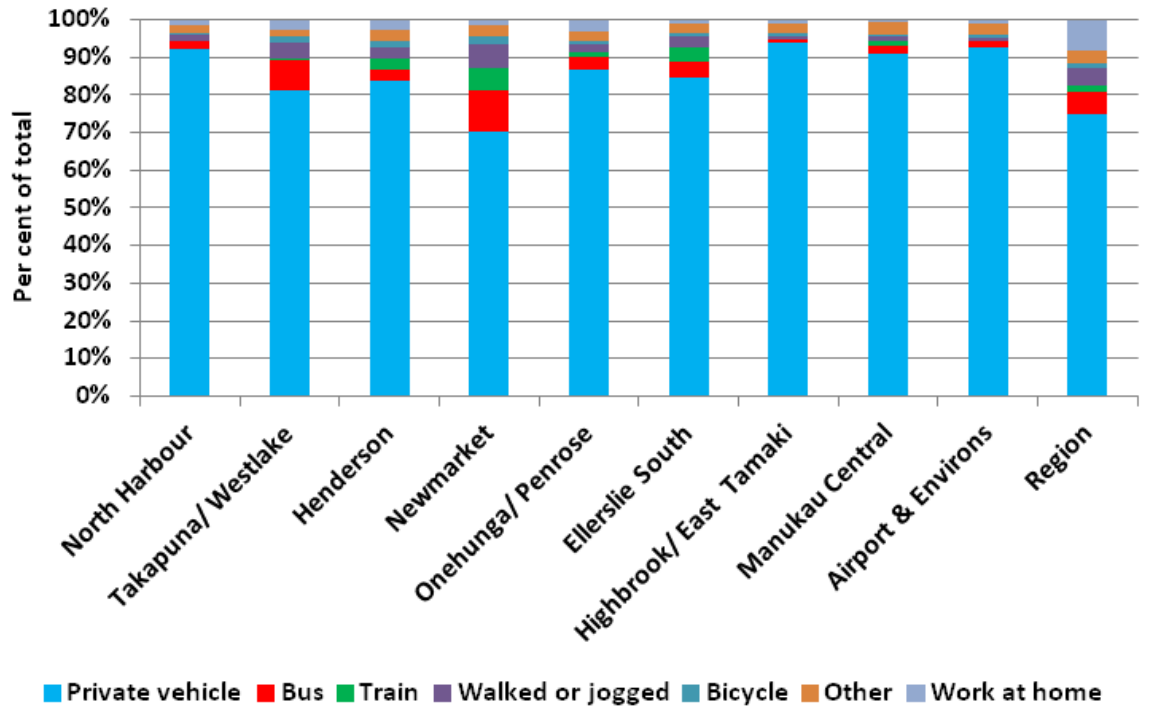


Figure 7.15
Selected Employment Areas : Modal Splits

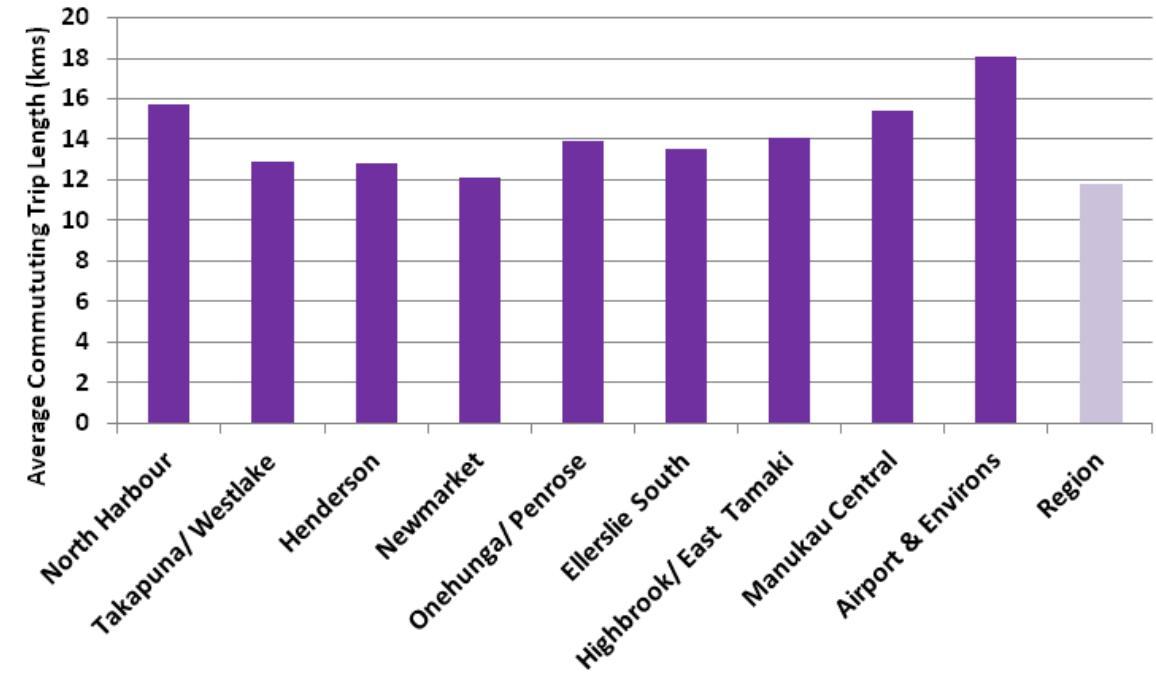


Figure 7.16
Selected Employment Areas : Average Travel to Work Distance

With the exception of Newmarket, the private vehicle shares for the selected employment areas are above the regional average and with the exception of Newmarket and Takapuna, the bus shares are below the regional average (which reflects the high flows to the CBD), and in some cases are very small. Rail shares are higher than the regional average in Newmarket, Henderson and Ellerslie South, reflecting the proximity of rail stations to these areas.

In all areas the work at home share is relatively low. This reflects the higher propensity of work at home trips away from the main employment centres in the Region in favour of residential locations especially those along the coast.

Average trip lengths are also higher than average. This in part reflects:-

- The extent to which these large employment areas need to draw in substantial numbers of workers to fill the employment opportunities. These workers may not be available from the areas themselves and those immediately adjacent; and

- The relatively high wages that are earned in many of these centres, which allows firms to attract workers from a wide area since the increased earnings more than offset the increased costs of commuting.

The attraction of workers from wide areas results in the relatively low active mode share.

In almost all the centres examined, the main commuting movements lie along axes connecting the sources of workers with the CBD and the extent of reverse commuting against the general pattern of peak direction flows is relatively small. This presumably reflects the opportunity for workers to take advantage of cheaper housing away from the centre, which appears to be more important than the opportunity for reverse commuting in less congested conditions.

7.3.12 Changes in Modal Splits 2006-2013

The changes in the modal shares to the selected employment areas between 2006 and 2013 are set out in Table 7.11 and Figure 7.17.

Table 7.11
Changes in Modal Shares of Commuting Journeys to Selected Employment areas 2006-2013
(Percentage points)

	North Harbour	Takapuna/ Westlake	Hender-son	New-market	Onehunga/ Penrose	Ellerslie South	Highbrook/ East Tamaki	Manukau Central	Airport & Environs
Private vehicle	-1.0%	-1.8%	-0.6%	-4.8%	-0.7%	-2.6%	1.1%	-0.2%	0.3%
Bus	0.9%	1.3%	0.1%	1.3%	-0.6%	1.1%	-0.5%	0.1%	0.3%
Train	0.0%	0.2%	1.4%	1.8%	0.9%	1.5%	0.0%	0.3%	0.0%
Walked or jogged	0.5%	0.3%	-0.9%	1.0%	0.6%	0.6%	0.0%	0.1%	-0.1%
Bicycle	0.0%	0.4%	0.8%	0.5%	0.0%	0.0%	0.0%	-0.1%	0.2%
Other	-0.2%	-0.6%	-1.0%	-0.3%	-0.6%	-0.4%	-0.6%	-0.2%	-0.5%
Work at home	-0.2%	0.1%	0.1%	0.5%	-0.4%	-0.2%	-0.1%	0.0%	-0.2%

Note The figures represent the changes in modal shares between 2006 and 2013 in terms of the percentage point difference. A change in modal share from 75 per cent in 2006 to 73 per cent in 2013 would therefore be recorded as a change of -2 percent.

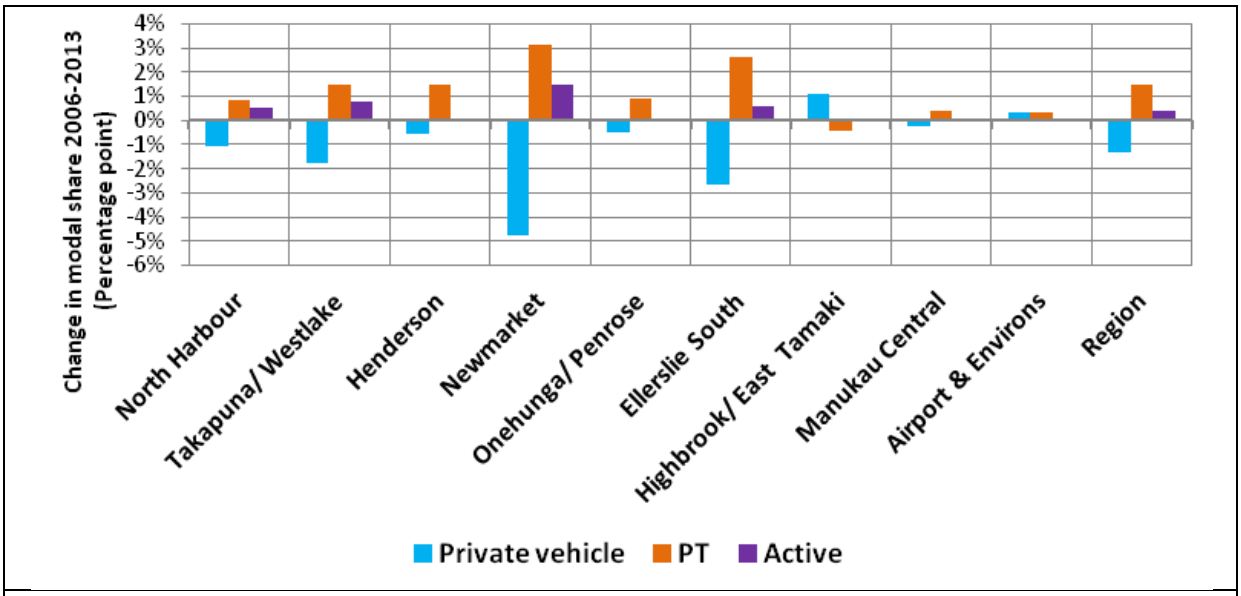


Figure 7.17
Change in Modal Shares for Selected Employment Areas 2006 to 2013
(Percentage points)

The private vehicle share has declined in all the selected areas with the exception of Highbrook/East Tamaki and the Airport and Environs. In these latter areas it is particularly difficult for public transport to provide an attractive alternative to private vehicles, but these are also areas where employment is growing strongly. Elsewhere private vehicle use has declined by more than the regional average in Newmarket, Ellerslie South and Takapuna/Westlake, where employment in the business service sectors is important. However, private vehicle use has declined by less than the regional average in North Harbour, Henderson, Onehunga and Manukau Central where manufacturing and more basic services are more important.

The public transport share has increased particularly strongly in Newmarket and Ellerslie and at about the regional average in Henderson and Takapuna. All of these are located on the RTN. The active mode share has increased significantly in Newmarket and to a lesser extent in Takapuna. The extension of the rail line to Manukau seems to have little impact on the overall public transport share and as Figure 6.12 and Figure 6.13 indicate there has been little increase in either bus or rail.

8 Trip Patterns for Selected Residential Locations

Key Findings

- For the newer residential areas of Westgate, Stonefields and Dannemora/Flatbush, the private car share for trips by residents of the area is relatively high at between 83 and 86 per cent, compared to the regional average of 75 per cent. Despite having an inner urban location, Stonefields has a private transport share that is higher than surrounding areas and is characteristic of development areas on the periphery of the urban area.
- The bus share is higher than the regional average at Westlake/Takapuna, Albany and Newmarket.
- The rail share is relatively high at Newmarket, New Lynn and Stonefields although for the last the overall public transport share is low.
- In general between 2006 and 2013, the private vehicle mode share has declined in most areas, although there were increases for Henderson, New Lynn, Stonefields and Dannemora/Flat Bush.
- Bus shares have generally increased except for Westgate and New Lynn where these have probably been reduced because of a switch to rail.
- Changes in the numbers of active trips have varied with no clear pattern.

8.1 Introduction

As well as considering the patterns of commuting trips to workplaces, an analysis has also been undertaken of the position for a range of residential areas within the Region. These comprise:-

- Orewa
- Westlake/Takapuna
- Albany (including the CAUs of Fairview and Northcross)
- Henderson
- New Lynn, including Lynnmall and Fruitvale
- Westgate
- Stonefields
- Newmarket
- Dannemora (including Kilkenny, Point View and Baverstock Oaks)

In total these accounted for about 26,000 commuting trips, around 5 per cent of the total. Because of the ways in which CAUs are defined they typically have a similar resident population (and workforce) and do not individually capture large resident populations.

8.2 Modal Splits

The modal splits for the commuting journeys made by the residents of these areas in 2013 are set out in Table 8.1 and Table 8.2.

Table 8.1
Mode Splits for Selected Residential Locations 2013

Residential Location	Mode						
	Private Vehicle	Bus	Rail	Walk	Cycle	Other	Work at Home
Orewa	75%	5%	0%	6%	1%	2%	12%
Westlake/Takapuna	63%	12%	0%	12%	1%	2%	10%
Albany	77%	10%	0%	2%	1%	1%	8%
Henderson	77%	4%	3%	6%	1%	3%	6%
New Lynn	74%	7%	6%	4%	1%	3%	5%
Westgate	85%	3%	1%	3%	0%	4%	5%
Stonefields	83%	1%	4%	2%	1%	1%	8%
Newmarket	43%	14%	6%	25%	3%	4%	5%
Dannemora/Flat Bush	86%	3%	1%	1%	0%	2%	7%
Region	75%	6%	2%	5%	1%	3%	8%

Table 8.2
Use of Different Modes for Selected Residential Locations 2013

Residential Location	Mode							
	Private Vehicle	Bus	Rail	Walk	Cycle	Other	Work at Home	Total
Orewa	1,833	111	3	150	21	51	288	2,457
Westlake/Takapuna	2,034	375	3	384	39	69	333	3,237
Albany	2,946	399	0	84	30	57	324	3,840
Henderson	2,370	117	93	174	39	96	171	3,060
New Lynn	2,907	258	240	147	45	132	207	3,936
Westgate	393	12	6	12	0	18	24	465
Stonefields	834	15	36	18	9	12	81	1,005
Newmarket	525	174	69	309	39	45	63	1,224
Dannemora/Flat Bush	6,147	186	51	63	27	147	531	7,152
Total	19,989	1,647	501	1,341	249	627	2,022	26,376

This is also summarised in Figure 8.1.

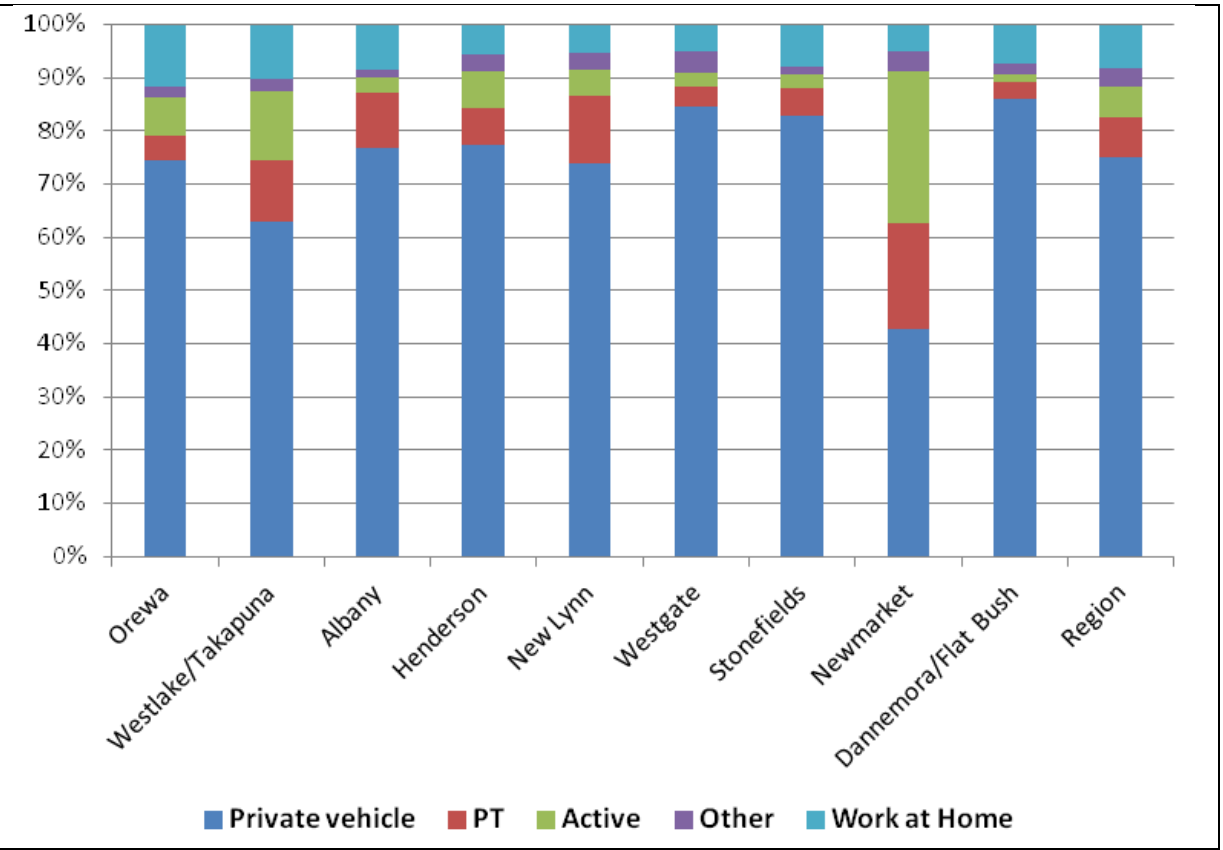


Figure 8.1
Mode Splits for Commuting Trips from Selected Residential Areas

There are considerable differences between the modal splits for the different areas. In particular:-

- Newmarket has a relatively low share of private vehicle use at just 43 per cent with relatively high shares of public transport, both bus and rail, and also a very high active mode share of 28 per cent.

- Westlake/Takapuna also has a relatively low private vehicle modal share of 63 per cent (compared to the regional average of 75 per cent), again with relatively high shares of public transport (12 per cent), active modes (13 per cent) and also work at home trips.

- New Lynn has a high public transport share, with high flows by both bus and rail, reflecting in part the availability of good rail services and in part the focussing of bus routes at the interchange in the area. However despite this high public transport share, the private vehicle share is also broadly in line with the regional average, but with the area having a low proportion of residents working at home.

- Despite similar advantages to New Lynn, commuting from Henderson has a much lower public transport share and a private transport share of 77 per cent that is slightly higher than the regional average.

- The new development areas of Westgate, Stonefields and Dannemora/Flatbush all have high private vehicle modal shares and low public transport ones. Although Stonefields is a development area within the Inner Urban sector, it has a high private transport modal share which contrasts with the shares of about 70 to 75 per cent in the neighbouring area but which is more characteristic of the Westgate and Flat Bush areas being developed on the urban periphery.

- The sites by the sea, Orewa and Takapuna, have relatively high shares of work at home.

The changes since 2006 are set out in Table 8.3 and Table 8.4.

Table 8.3
Changes in Trips by Mode for Selected Residential Locations 2006-2013

Residential Location	Car	Bus	Rail	Walk	Cycle	Other	Work at Home	Total
Orewa	240	30	3	3	0	6	48	330
Westlake/Takapuna	246	171	3	93	15	-9	39	558
Albany	1,035	288	-3	36	21	-9	99	1,467
Henderson	243	21	36	-18	15	-3	6	300
New Lynn	333	-6	90	-3	24	-30	27	435
Westgate	90	-3	6	9	-3	9	6	114
Stonefields	762	15	33	12	9	6	72	909
Newmarket	144	81	60	69	24	18	0	396
Dannemora/Flat Bush	975	69	39	-27	9	-36	72	1,101
Total	4,068	666	267	174	114	-48	369	5,610

Table 8.4
Changes in Modal Splits for Selected Residential Locations 2006-2013
(Percentage points)

Residential Location	Car	Bus	Rail	Walk	Cycle	Other	Work at Home
Orewa	-0.3%	0.7%	0.1%	-0.8%	-0.1%	0.0%	0.4%
Westlake/Takapuna	-3.9%	4.0%	0.1%	1.0%	0.3%	-0.8%	-0.7%
Albany	-3.8%	5.7%	-0.1%	0.2%	0.4%	-1.3%	-1.0%
Henderson	0.4%	0.3%	1.0%	-1.3%	0.4%	-0.4%	-0.4%
New Lynn	0.3%	-1.0%	1.8%	-0.5%	0.5%	-1.3%	0.1%
Westgate	-1.8%	-1.7%	1.3%	1.7%	-0.9%	1.3%	0.0%
Stonefields	8.0%	1.5%	0.5%	-4.5%	0.9%	-5.1%	-1.3%
Newmarket	-3.1%	3.0%	4.6%	-3.7%	1.4%	0.4%	-2.5%
Dannemora/Flat Bush	0.5%	0.7%	0.5%	-0.6%	0.1%	-1.0%	-0.2%
Region	-1.3%	0.8%	0.7%	0.2%	0.2%	-0.6%	0.1%

The comparison set out in Table 8.4 reveals a rather mixed picture across the Region with modal shares typically changing in different directions for different areas.

- For Westlake/Takapuna and Albany, there has been a shift in the share of private vehicle use towards bus. It should be noted however that despite the change in the modal split, the number of car trips increased in both these locations, as well as in all the other areas examined. The share working at home also dropped in these areas.

- For Orewa, the effect has been more muted with a smaller decline in the private transport mode share and a smaller increase in bus use.

- For Henderson and New Lynn there were small increases in the private transport modal share and also in the public transport share, although in the case of New Lynn there was a small shift from bus to rail.

- For Newmarket there was a fall in the private vehicle modal share and a large increase in the public transport share. There was also a decline in the share of active mode trips, which although growing had a lower rate of increase than the total for the area.

- For the selected centres although the private vehicle mode share declined between 2006 and 2013, the numbers of private vehicle trips increased for each of the areas examined and in all cases was the largest contributor to the growth in commuting trips.

In general the position for areas is of a relative decline in the mode share for private trips (although with an increase in the numbers of these), balanced by increases in the public transport share. The share of active modes has varied by area, especially for walking trips.

9 Changes in the RTN Corridors : The Northern Busway and the Rail Corridor

Key Findings

- Bus use in the North Shore is high in relation to the regional average with a share of 9 per cent compared to 6 per cent for the Region.
- Within the North Shore area bus use is particularly high in the areas immediately served by the Busway stations. It is also high but similar for areas both served by Busway feeder services and the rest of the North Shore.
- Bus use has grown very substantially in the areas immediately served by Busway stations and served by Busway feeder routes.
- The growth of private transport has been small for the areas served by the Busway stations and for the parts of North Shore not served by the Busway (this latter may reflect the importance of commuting to the CBD). For the areas served by the feeder routes, the private transport growth rate has been above the regional average although substantially less than the growth rate in public transport. This may reflect the higher share of commuting to non-CBD locations from this area.
- The introduction of the Busway appears to have resulted in a decline in the total number of private transport trips between the North Shore and the CBD between 2006 and 2013.
- The growth in overall trip making from the North Shore has been focussed on the Auckland Harbourside area, where both private and public transport trips have increased. For commuting to other parts of the CBD there have been declines in private transport trips which to a greater or lesser extent have been offset by increases in public transport.
- The share of rail trips from locations in the rail corridor excluding the CBD is about 4.4 per cent, compared to an average of 1.7 per cent overall.
- Only about 60 per cent of rail trips come from those living in areas adjacent to the rail line away from the CBD. About a third are for trips from areas further away, emphasising the importance of good links to the rail stations and the provision of park and ride facilities at stations.
- Between 2006 and 2013, the number of rail trips from the residents of the rail corridor has increased by 74 per cent, broadly in line with the increase for the Region as a whole.
- Total commuting trips for these areas have grown by slightly less than the regional average.

9.1 Introduction

There has been considerable investment in the RTN corridors, particularly the construction of the Northern Busway and the upgrading of the rail network. This section considers the patterns of trip making in the areas potentially served by these, looking at the position in 2013 and also the changes that have occurred since 2006.

9.2 Trip Making in the Northern Busway Corridor

9.2.1 Introduction

The investment in the Northern Busway has provided a significant improvement in the level of service and accessibility of public transport in parts of the North Shore and the effects of this on travel patterns in the North Shore have been analysed.

For this, the areas most likely to be affected by the construction of the Northern Busway, taken to be the former North Shore City area, have been divided into three parts:-

- The CAUs in which stations along the Busway are directly located or are immediately adjacent.
- The CAUs potentially served by bus services which could make use of the Busway for journeys across the Waitemata Harbour.
- Other CAUs in the North Shore, primarily entering the SH1 corridor via Onewa Road and so not directly affected by the construction of the Busway.

These are set out in Figure 9.1.

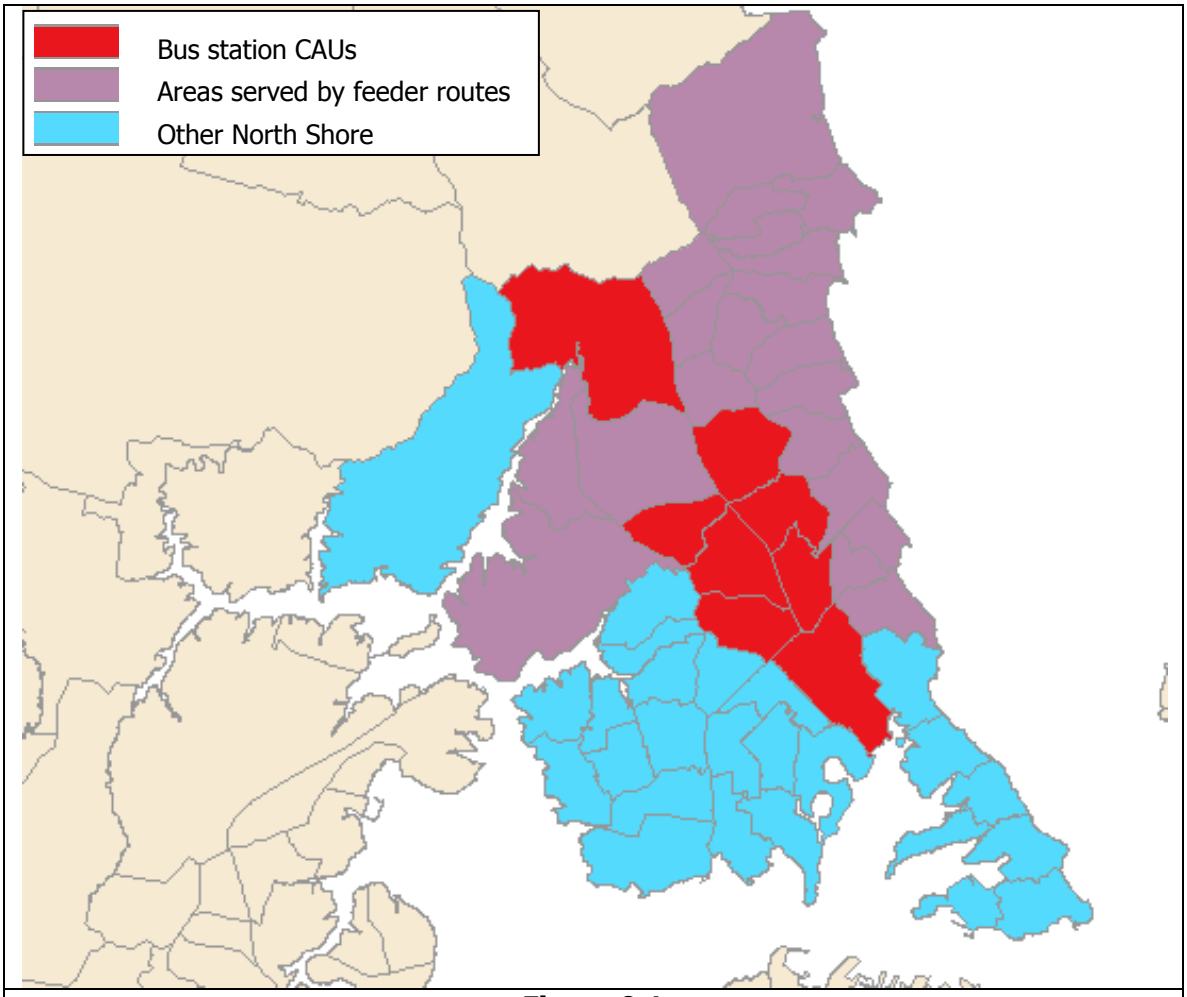


Figure 9.1
Bus Catchment Areas on the North Shore

9.2.2 The Position in 2013

The breakdown of commuting trips by mode in 2013 for the potential Busway catchment areas is set out in Table 9.1 for the trip totals and Table 9.2 for the modal shares.

Table 9.1
2013 Commuting Patterns from North Shore Origins by Busway Catchment Areas
Total Journeys

Area	Bus	Private Transport	Active Modes	Work at Home	Other	Total
Bus Station CAUs	1,641	11,094	693	1,017	300	14,745
Other Feeder Zones	2,805	25,317	888	3,396	594	33,000
Other North Shore	3,657	28,236	1,983	3,573	2,604	40,053
North Shore Total	8,103	64,647	3,564	7,986	3,498	87,798
Regional Total	29,589	371,925	28,293	41,289	24,609	495,705
North Shore as proportion of regional total	27%	17%	13%	19%	14%	18%

Table 9.2
2013 Commuting Patterns from North Shore Origins by Busway Catchment Areas
Modal Shares

Area	Bus	Private Transport	Active Modes	Work at Home	Other	Total
Bus Station CAUs	11%	75%	5%	7%	2%	100%
Other Feeder Area	9%	77%	3%	10%	2%	100%
Other North Shore	9%	70%	5%	9%	7%	100%
North Shore Total	9%	74%	4%	9%	4%	100%
Regional Total	6%	75%	6%	8%	5%	100%

The modal shares are also summarised in Figure 9.2.

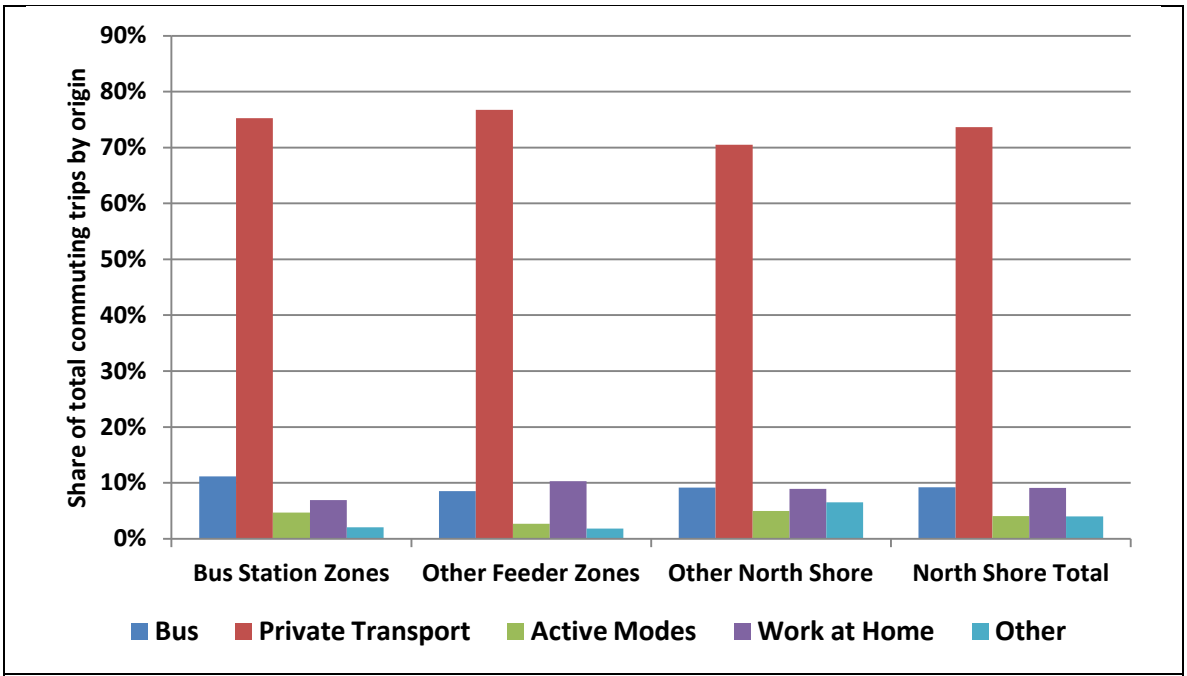


Figure 9.2
Modal Shares for Commuting from the North Shore by Busway Catchment Areas 2013

The North Shore has relatively high bus use which accounts for 27 per cent of total bus commuting in the Region compared to North Shore's 18 per cent share of total trips in the Region and as a result the modal share for bus is 9 per cent compared to the regional average of 6 per cent. Within the North Shore, bus use is particularly high in the bus station CAUs where it accounts for 11 per cent of all trips compared to about 9 per cent for the North Shore as a whole. Despite the high share for bus, private transport shares are at or above the regional average in the bus station zones and the feeder zones.

Within the area considered, the share of bus use for commuting is high in the vicinity of the bus stations. Away from these areas directly served by the Busway, the shares are similar both for the feeder zones where services would make use of the Busway and for the areas where the services have probably not been affected directly by the Busway. These high bus shares for the latter area probably reflect the importance of commuting to the CBD (as set out above in Figure 7.1) and the rest of the central area where buses are able to provide an attractive alternative.

9.2.3 Changes between 2006 and 2013

The changes between 2006 and 2013 for the areas identified are set out in Table 9.3.

Table 9.3
Commuting Patterns from North Shore Origins - Changes 2006-2013

Area	Total All Modes				Bus				Car			
	2006	2013	Growth 2006-13		2006	2013	Growth 2006-13		2006	2013	Growth 2006-13	
Total for Region	454,674	495,705	9%	41,031	23,787	29,589	24%	5,802	346,755	371,925	7 %	25,170
Commuting from North Shore												
Bus station CAUs	13,980	14,745	5%	765	1,008	1,641	63%	633	10,986	11,094	1%	108
Other feeder areas	29,166	33,000	13%	3,834	1,683	2,805	67%	1,122	23,292	25,317	9%	2,025
Other North Shore	38,394	40,053	4%	1,659	2,724	3,657	34%	933	27,747	28,236	2%	489
Total from North Shore	81,540	87,798	8%	6,258	5,415	8,103	50%	2,688	62,025	64,647	4%	2,622
North Shore as per cent of regional total	17.9%	17.7%			22.8%	27.4%			17.9%	17.4%		

The main points arising from the table include:-

- Total growth in commuting by North Shore residents at 8 per cent has been below that for the Region as a whole. Growth in the immediate catchment area of the bus stations is further below the North Shore total.

- Although total trip making has been limited, growth in bus use has been very considerable, increasing by 50 per cent in the North Shore as a whole compared to an increase of about 24 per cent across the Region.

- The increase in bus trips from origins in the North Shore between 2006 and 2013 represents almost half the total regional increase.

- Within the North Shore the increases in bus use in the immediate bus station catchment areas and the areas served by feeders are very substantial at about 60-65 per cent, although off a fairly small base. The growth in the other North Shore areas, not potentially benefitted by the Busway, has been much slower. Although this is still above the regional growth in bus passengers of 24 per cent, it is broadly in line with the growth of public transport as a whole within the Region of about 33 per cent, (although this latter figure includes a considerable boost from rail which is not available on the North Shore).

- The impact of the Busway on the private transport share appears to be substantial, with growth being substantially below the total increase in commuting for the areas served by the Busway and below the growth for the Region as a whole. However, a similar although not quite as strong outcome has occurred for the other North Shore areas not served by the Busway, where the growth in private transport commuting of 1.8 per cent is below the overall growth in commuting of 7.7 per cent. It is however possible that the publicity for bus services and the reorganisation of these associated with the completion of the Busway has encouraged bus use elsewhere in the area.

- With the increase in bus use, the share of the North Shore area in total regional bus movements has increased from 23 per cent to 27 per cent, compared with a total commuting share of about 17-18 per cent. Its share of overall public transport use (which includes rail) was also relatively high at about 22 per cent again higher than its share of total commuting trips. This share has increased from 19 per cent in 2006.

- The growth in bus trips in the North Shore area amounted to almost half the total for the Region as a whole. By contrast the growth in private transport commuting trips only amounted to about 10 per cent of the regional total.

- Within the North Shore, the increases in the absolute numbers of public transport trips were higher than those for private transport for the Busway station CAUs and the other North Shore, but lower for the areas served by feeder routes. This possibly reflects the smaller share of workers in the feeder areas commuting to the CBD as illustrated earlier in Figure 7.1. For the North Shore as whole, the absolute growth in the numbers of car trips and bus trips was broadly in balance. The position is illustrated in Figure 9.3.

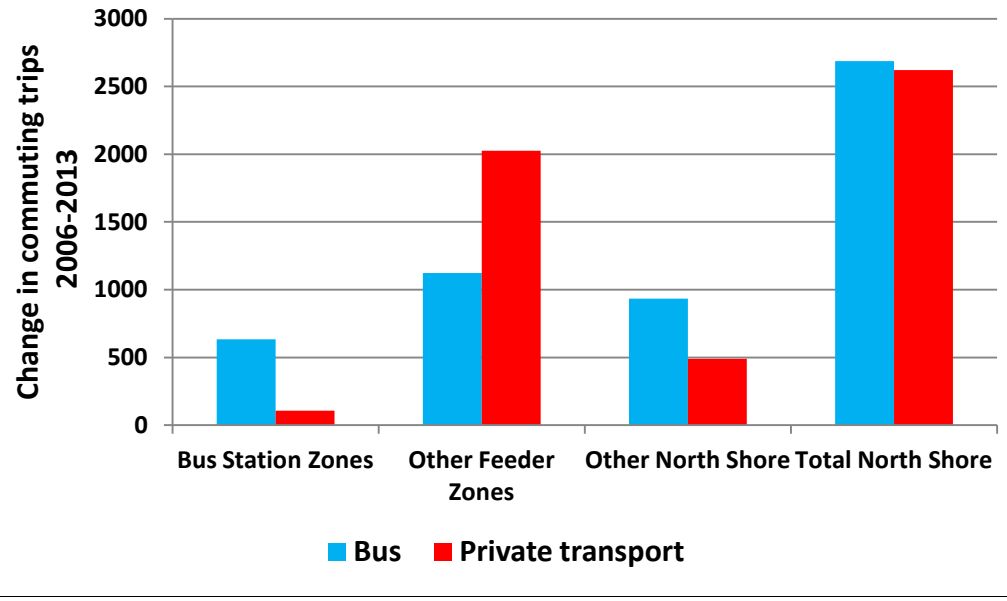


Figure 9.3
Change in North Shore Commuting Trips by Origin by Bus and Private Transport 2006-2013

9.2.4 Change in Trips to the CBD from the North Shore

As well as considering movements in general from the area served by the Northern Busway, we have also examined the position just for movements to the CBD, a particular focus of trip making and the main destination for services using the Busway, from the North Shore as a whole.

The change in trip making from the North Shore to the CBD is set out in Table 9.4 and Figure 9.4.

Table 9.4
Changes in Trip Making from the North Shore to the CBD 2006-2013

Mode	CBD CAU					
	514101 Auckland Harbourside	514102 Auckland Central West	514103 Auckland Central East	514200 Newton	514301 Grafton West	Total
Private Vehicle	300	-612	-150	-51	-39	-552
Bus	645	282	357	24	24	1,332
Train	3	0	0	0	0	3
Walk	9	-15	0	-6	0	-12
Cycle	21	0	12	3	3	39
Other	81	-150	-102	-18	-18	-207
Work at Home	33	6	21	0	0	60
Total	**1,092**	**-489**	**138**	**-48**	**-30**	**663**

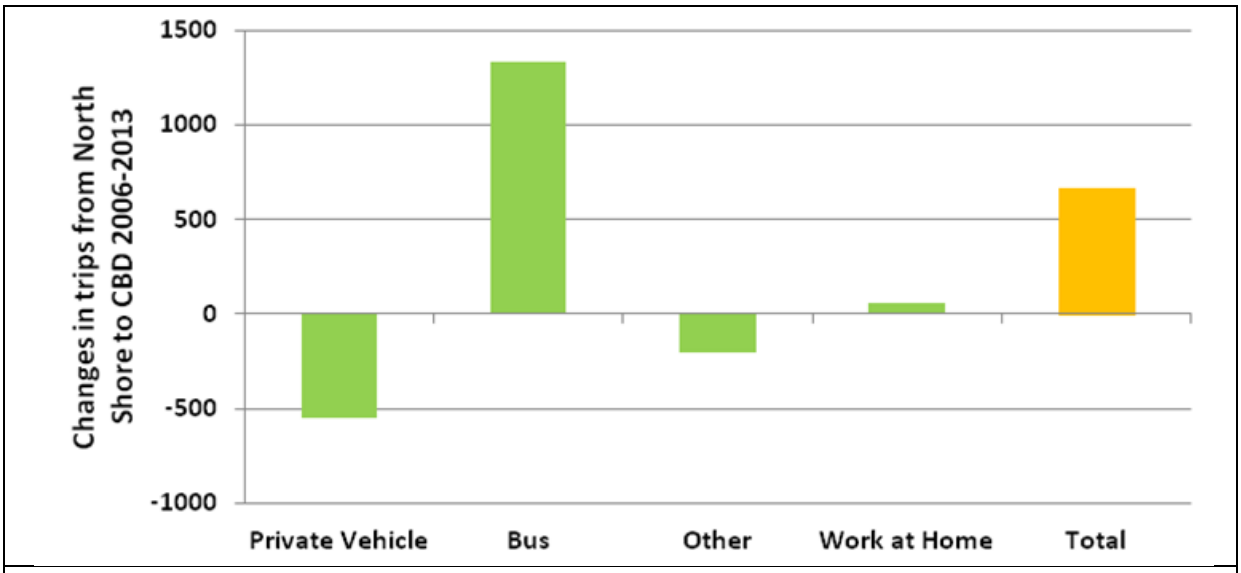


Figure 9.4
Changes in Commuting into the CBD from the North Shore by Mode 2006-2013

While the growth of commuting from the North Shore to the CBD has been fairly limited, increasing by about 6 per cent compared to overall CBD growth in employment of about twice that amount, there has been a fairly substantial shift in the modal split between 2006 and 2013, following the opening of the Northern Busway. In that period the number of bus trips increased by about 1,350, with private car journeys falling by about 550. Other trips, which include ferry journeys, have also declined.

There are also different patterns of change for the different areas within the CBD. Almost all the increase in trip making is to Auckland Harbourside, much of which is well placed for movements from the North Shore and which experienced growth in both private vehicle and bus journeys. For other areas in the CBD, where the numbers from the North Shore either fell or grew more slowly, there has been a decline in private vehicle trips, matched to a greater or lesser extent by increases in bus use.

The changes in the overall modal splits for this movement are set out in Table 9.5.

Table 9.5
Changes in Mode Split for Commuters between the North Shore and CBD 2006 and 2013

Mode	Mode Split 2006	Mode split 2013
Private Vehicle	59.7%	52.2%
Bus	25.2%	34.5%
Train	0.0%	0.0%
Walk	0.7%	0.6%
Cycle	0.4%	0.6%
Other	13.5%	11.1%
Work at Home	0.5%	1.0%

This is also set out in Figure 9.5.

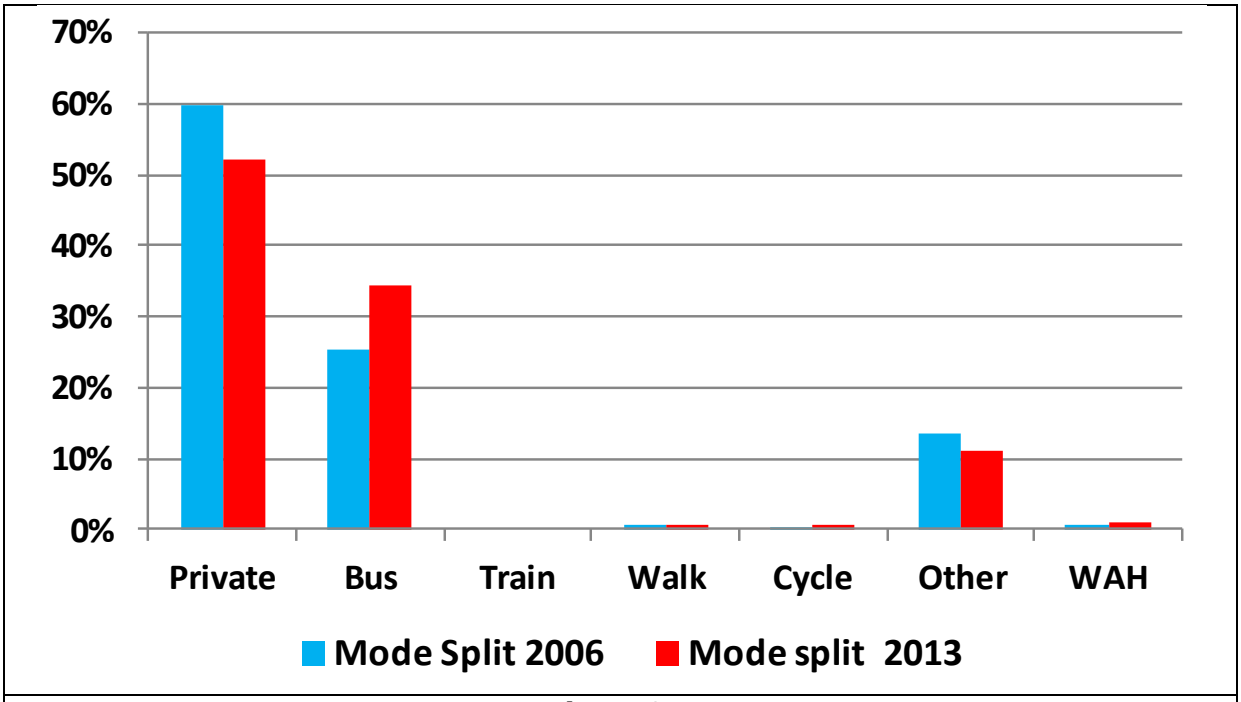


Figure 9.5
Changes in Mode Split for Commuters between the North Shore and CBD 2006 and 2013

9.3 Changes in Trip Making in the Rail Corridor

The improvement of the rail network also has the potential to alter trip patterns and particularly modal splits within the corridor it serves. An analysis was therefore undertaken of the changes between 2006 and 2013 in the travel patterns of those living in the rail corridor and these were compared with the changes that have occurred more generally in the Region. For this purpose, the coverage of the rail corridor is as set out in Figure 9.6. While the CBD is rail served, the travel characteristics of the area owe more to the particular conditions in the central city with the juxtaposition of employment and dwellings than to the availability of rail services and the use of rail by CBD residents is small (288 or about 3 per cent of all rail trips). It has therefore been excluded from this analysis, both as a part of the rail corridor and also from the regional totals against which the rail corridor has been compared.

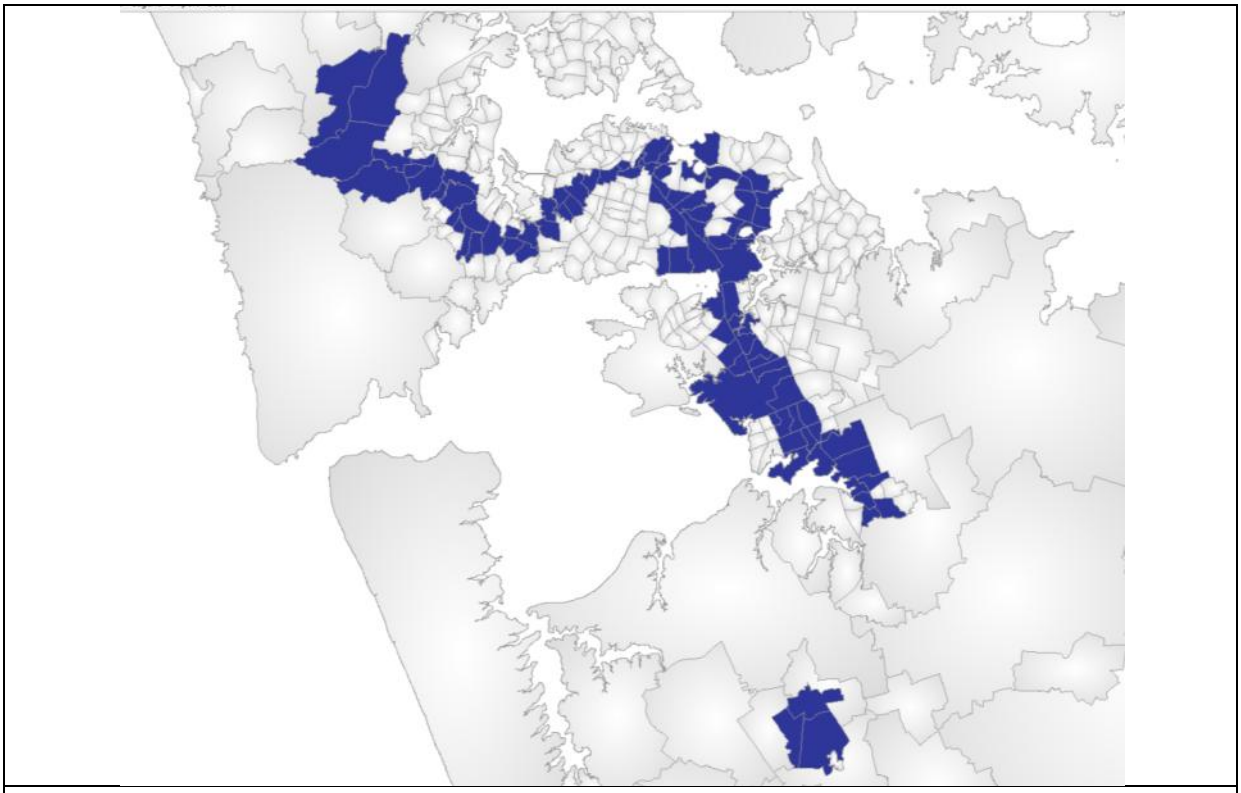


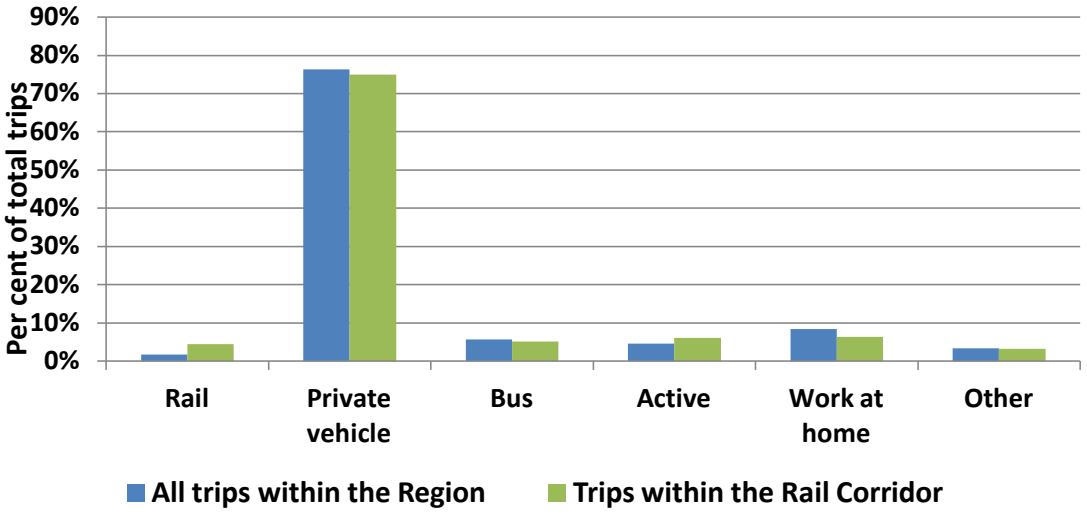
Figure 9.6
Areas Included in the Rail Corridor : Analysis of Commuting by Residential Location

The numbers of trips from workers living in the corridor by all modes in 2013 are set out in Table 9.6 and Figure 9.7. This also includes the position for the Region as a whole (excluding the CBD).

Table 9.6
Trips from Residential Areas within the Rail Corridor

	All trips within the Region (1)		Trips from Rail Corridor (1)		
	No	Share of Total	No	Share of Total	Share of Total Trips for Mode
Rail	8,094	1.7%	4,986	4.4%	62%
Private vehicle	368,844	76.3%	85,239	74.9%	23%
Bus	27,762	5.7%	5,796	5.1%	21%
Active	22,230	4.6%	6,906	6.1%	31%
Work at home	40,596	8.4%	7,227	6.4%	18%
Other	15,828	3.3%	3,621	3.2%	23%
Total trips	**483,354**	**100%**	**113,775**	**100%**	**24%**

Notes (1) Areas exclude the CBD



Notes that these figures exclude the CBD

Figure 9.7
Modal Split in the Rail Corridor and Region 2013

The main features which arise from this analysis include:-

- Total commuting trips from locations in the rail corridor as set out in Figure 9.6 account for 23 per cent of all trips in the Auckland Region in 2013 and 24 per cent when the CBD is excluded.

- Rail trips account for 4.4 per cent of all trips made from the rail corridor compared to an average of 1.7 per cent for the Region, excluding the CBD, as a whole.

- Trips from the rail corridor itself comprise about 60 per cent of all rail trips in the Region. The balance of trips, which amount to almost a third of the total, would be from users not living in the rail corridor as defined and potentially using other modes such as bus or car to reach rail stations. This highlights the importance of providing good access to the rail network for users of these other modes and the provision of park and ride facilities at stations and bus feeder services. The numbers of rail users from those living in the CBD itself are relatively small at about 3 per cent of the total.

- The private vehicle modal split for the rail corridor at 75 per cent is slightly below that for the Region excluding the CBD, which is about 76 per cent. However if the CBD is included where the share of car trips is low, the average private vehicle modal share for the Region would be similar to that for the rail corridor.

- The bus share for the corridor is lower than that for the Region as a whole. However the combined public transport share for the corridor at 9.5 per cent is higher than that for the Region excluding the CBD of 7.4 per cent.

- The share of active trips in the corridor is higher than that for the Region as a whole.

- The work at home share is relatively low. This may reflect some sorting of the population with workers not requiring good transport access locating in areas away from the rail line. However, it may reflect the desire of those working at home to locate along the harbour edges (as discussed in Section 6.3.6) which are not well served by rail.

Overall trip making in the rail corridor does include a slightly higher modal share for public transport than is experienced in the wider Region. This is in part balanced by a lower share of private vehicle use and a lower share of work at home trips.

The period since 2006 has seen considerable investment in the rail network and services, and the changes that have occurred between 2006 and 2013 are set out in Table 9.7 and Figure 9.8 and Figure 9.9.

Table 9.7
Change in Commuting from Residential Locations within the Rail Corridor

Mode	Trips from Rail Corridor 2013		Trips from Rail Corridor 2006		Change in Trips 2006-2013		Change in Modal Share (percentage point)
	No	Modal Share	No	Modal share	No	Per cent	
Rail	4,986	4.4%	2,862	2.7%	2,124	74.2%	1.7%
Private vehicle	85,239	74.9%	80,352	76.1%	4,887	6.1%	-1.2%
Bus	5,796	5.1%	5,250	5.0%	546	10.4%	0.1%
Active	6,906	6.1%	6,426	6.1%	480	7.5%	0.0%
Work at home	7,227	6.4%	6,582	6.2%	645	9.8%	0.1%
Other	3,621	3.2%	4,122	3.9%	-501	-12.2%	-0.7%
Total trips	**113,775**	**100%**	**105,594**	**100%**	**8,181**	**7.7%**	**0.0%**

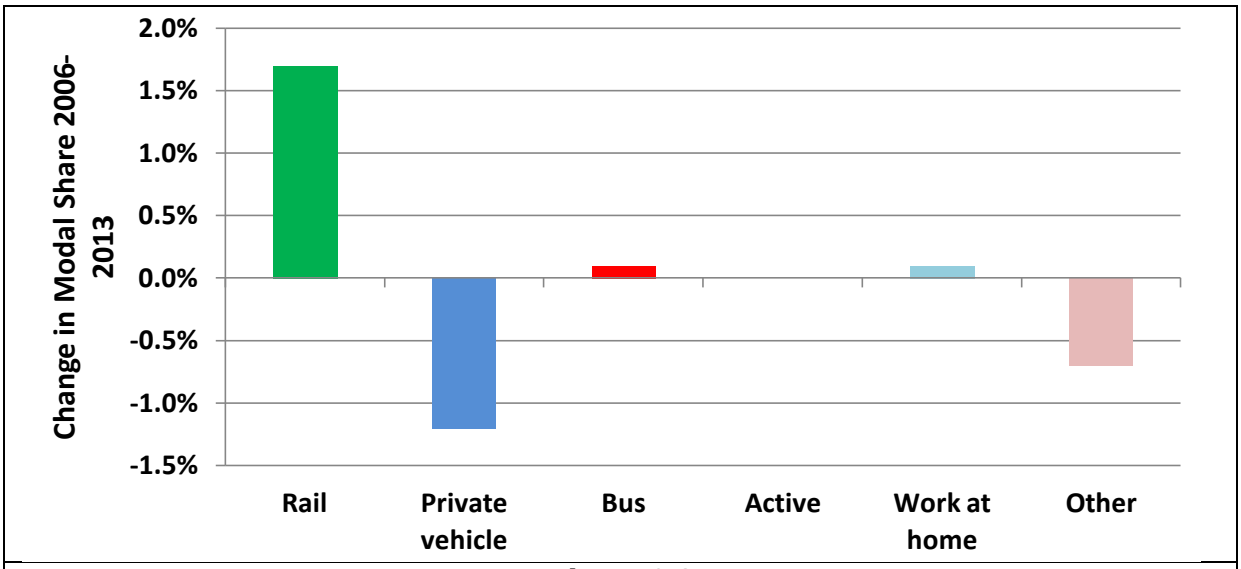


Figure 9.8
Changes in Modal Share in the Rail Corridor 2006-2013

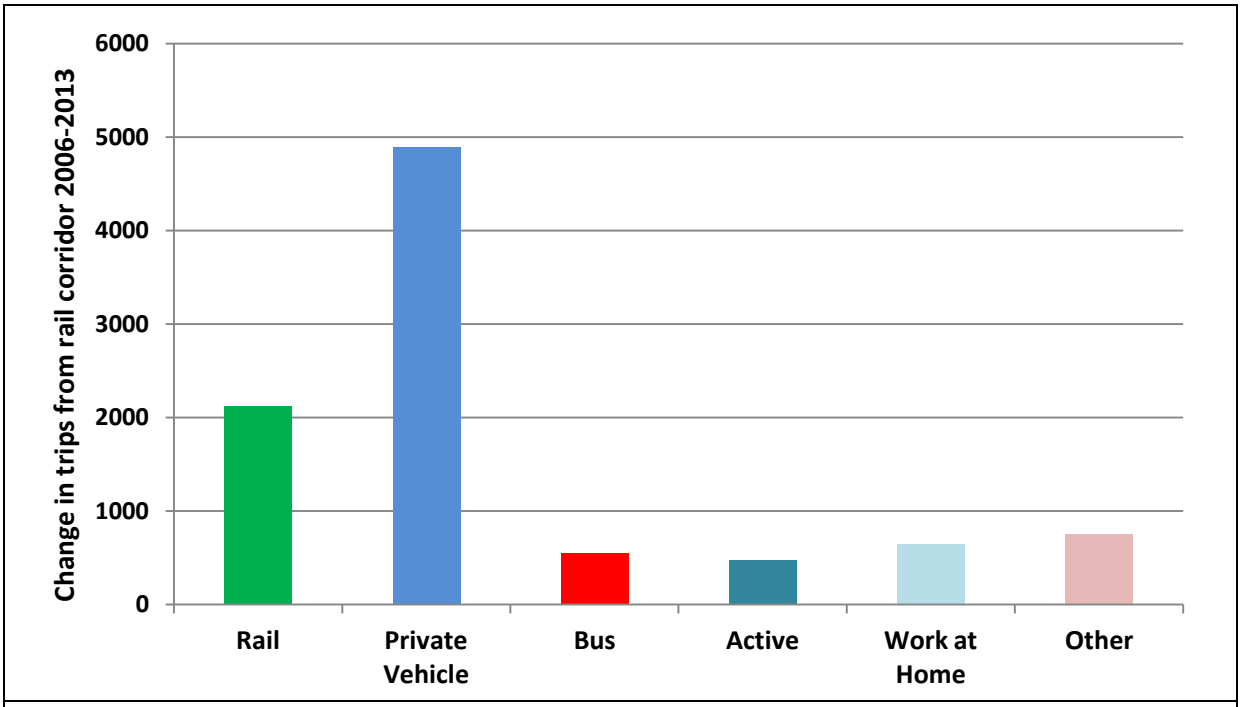


Figure 9.9
Changes in Commuting Trips from the Rail Corridor by Mode 2006-2013

Over the period:-

- Total commuting trips from residences in the rail corridor have grown by 7.7 per cent, slightly below the growth of 8.1 per cent in the wider Region (excluding the CBD).

- The number of rail trips from those commuting from residences within the corridor has increased by 74 per cent. This is broadly in line with the growth of 73 per cent for the Region as a whole, and again demonstrates the importance of the links to the rail network from surrounding areas.

- The increase in rail has resulted in an increase in the modal share for rail of about 1.7 percentage points from 2.7 per cent in 2006 to 4.4 per cent in 2013 in the corridor.

- The share of bus trips has remained broadly constant. Much of the increase in rail trips appears to have come as a result of a switch from private vehicles, since the modal share for these trips has declined by about 1.2 percentage points.

- Although rail has grown considerably and increased its share of commuting trips from the corridor, growth in private car use has accounted for the majority of the growth in commuting from rail corridor origins, increasing by about 6 per cent.

10 Cross Harbour Commuting Movements

Key Findings

- Cross harbour commuting has been growing rapidly, especially over the period from 2006 when it has increased by a total of 25 per cent compared to the increase for the Region as a whole of 9 per cent. While growth in both directions has been substantial, growth from south to north has been very large, increasing by over 50 per cent between 2006 and 2013, and almost doubling between 2001 and 2013.
- Over the period from 2006 to 2013, the absolute growth in commuting northbound was greater than that southbound.
- Public transport currently accounts for about 15 per cent of cross harbour commuter movements, 18 per cent for southbound movements and 9 per cent for those northbound. This has increased at a faster rate than private transport, increasing its mode share from 11 per cent to 15 per cent between 2006 and 2013.
- Although the numbers of private transport commuter trips have increased by over a quarter, its share of the total has declined from 81 per cent to 76 per cent. For southbound trips the absolute increase in public transport was greater than that for private transport.
- Overall commuting movements southbound across the harbour are dominated by movements between North Shore and the Isthmus, which account for about three quarters of the total. Of these three quarters, slightly less than half are to the CBD, and the public transport share of travel to the CBD is 35 per cent. Public transport accounts for a significantly smaller share, 8 per cent, of movements between the North Shore and the rest of the Isthmus, although this share has doubled since 2006.
- Although the numbers are relatively small public, transport accounts for about a quarter of trips between areas further north and the CBD. For other movements the public transport share is about 5 per cent.

10.1 Introduction

The effects of the Northern Busway on movements to the CBD have been considered above in Section 9 but these movements only form part of the total cross-harbour flows. This section therefore provides a more aggregated picture of cross-harbour journey to work movements including those travelling from south of the harbour to the north. For the purposes of this analysis the areas to the north of the harbour which are likely to make trips across the harbour rather than round its western extremity are considered to comprise North and East Rodney and the former North Shore City area. Trips from further west are considered likely to travel round the harbour rather than across it. The areas to the south generating or attracting cross harbour movements have been taken to be the former Auckland and Manukau Cities and areas further south. In addition the analysis has also considered separately the areas closest to the harbour comprising the former Auckland and North Shore City areas and those further to the north and south and has also separated out the CBD. The definitions of these areas are set out in Figure 10.1.

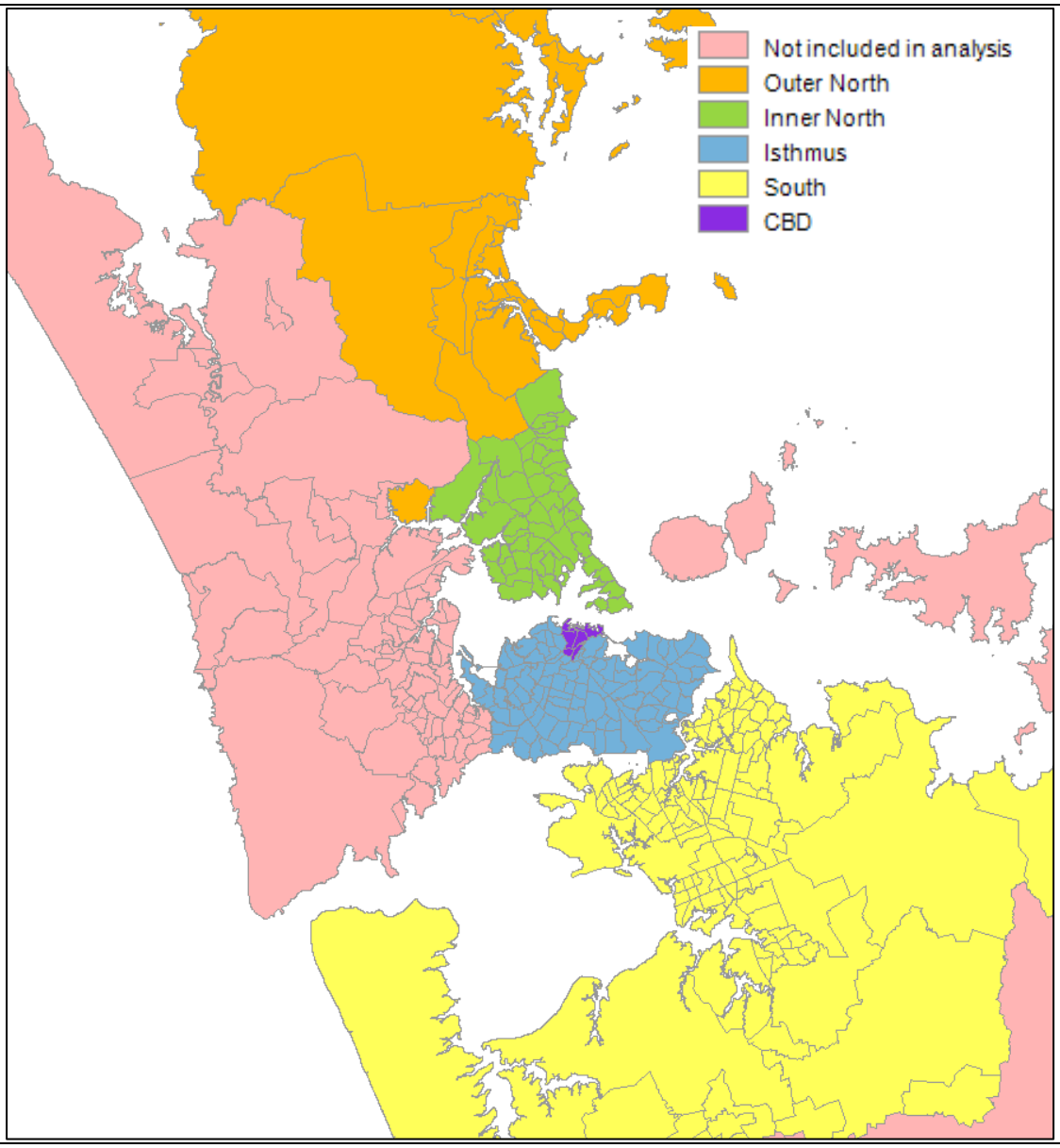


Figure 10.1
Definition of Areas for Analysis of Cross Harbour Commuting Journeys

10.2 Total Cross Harbour Commuting Movements 2001, 2006 and 2013

The broad patterns of cross harbour commuting movements in 2001, 2006 and 2013 are set out in Table 10.1.

Table 10.1
Total Cross Harbour Commuting Journeys by Direction 2001,2006 and 2013

Direction	Total Trips			Total Growth over Period					
				Number			Per cent		
	2001	2006	2013	2001-2006	2006-2013	2001-2013	2001-2006	2006-2013	2001-2013
North-south	27,630	30,705	35,523	3,075	4,818	7,893	11%	16%	29%
South-north	7,176	9,072	14,193	1,896	5,121	7,017	26%	56%	98%
Both directions	34,806	39,777	49,716	4,971	9,939	14,910	14%	25%	43%
Per cent southbound	79%	77%	71%						

Cross harbour commuting movements have grown fairly substantially over the period with those in southbound direction increasing by almost 30 per cent between 2001 and 2013 and the smaller flows northbound almost doubling, both representing a similar numerical increase. Unlike the position for the Region as a whole, growth in the second part of the period from 2006 to 2013 was faster than in the earlier years for movements in both directions. With the higher percentage growth in the northbound direction, the share of movements in this direction has increased by almost 50 per cent, growing from 21 per cent in 2001 to 29 per cent in 2013. This may reflect the rapid increase in population in the CBD.

The position is summarised in Figure 10.2.

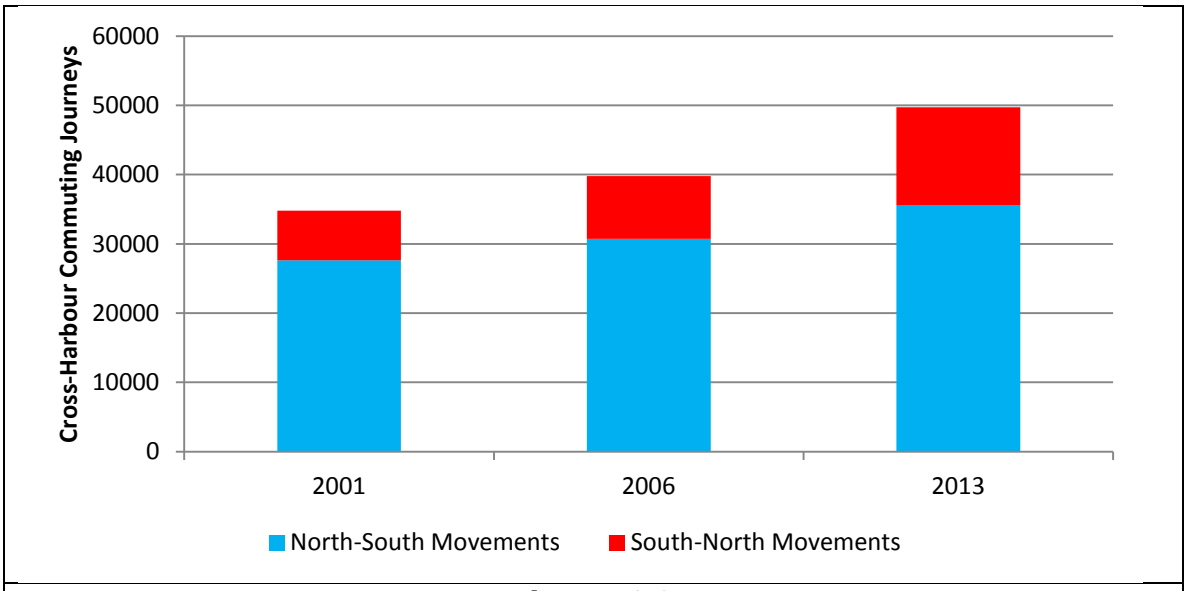


Figure 10.2
Cross Harbour Commuting 2001, 2006 and 2013

10.3 Movements by Mode

The breakdown of the position by the major modes is set out in Table 10.2 and Figure 10.3.

Table 10.2
Cross Harbour Commuting Trips by Mode

Direction	Trips			Modal Share			Total Growth over Period		
	2001	2006	2013	2001	2006	2013	2001-2006	2006-2013	2001-2013
Private Transport									
North-south	22,611	23,853	26,136	82%	78%	74%	1,242	2,283	3,525
South-north	6,591	8,235	11,844	92%	91%	83%	1,644	3,609	5,253
Both directions	29,202	32,088	37,980	84%	81%	76%	2,886	5,892	8,778
Public Transport									
North-south	3,066	3,987	6,354	11%	13%	18%	921	2,367	3,288
South-north	282	369	1,245	4%	4%	9%	87	876	963
Both directions	3,348	4,356	7,599	10%	11%	15%	1,008	3,243	4,251
Active Modes									
North-south	234	282	441	1%	1%	1%	48	159	207
South-north	123	150	528	2%	2%	4%	27	378	405
Both directions	357	432	969	1%	1%	2%	75	537	612
Other									
North-south	1,482	2,343	2,202	5%	8%	6%	861	-141	720
South-north	108	267	471	2%	3%	3%	159	204	363
Both directions	1,590	2,610	2,673	5%	7%	5%	1,020	63	1,083

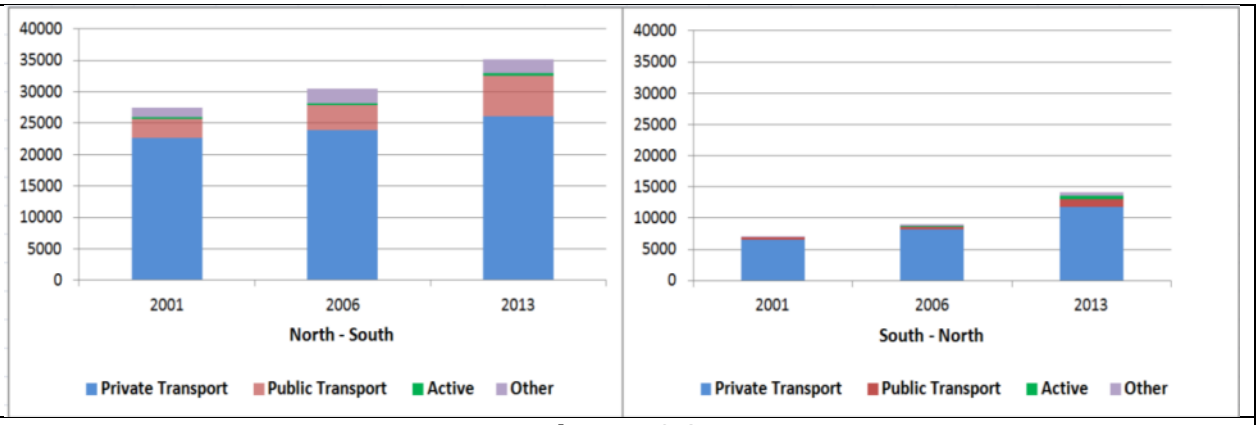


Figure 10.3
Changes in Cross Harbour Flows by Direction and Mode 2001-2013

The key points which emerge from this table and figure are:-

- There has been fairly substantial growth for almost all modes and time periods and directions, the only exception being a decline in "Other" northbound in 2006-2013.

- With the exception of "Other", growth in the second part of the period has been faster than in the first period, often substantially so.

- In all cases the percentage growth northbound has been faster than southbound, especially in the period from 2006 to 2013. For private transport, the dominant mode, the absolute increase northbound (3,600) has been greater than that southbound (2,300).

- While the absolute number of private transport commuting movements has grown in both time periods and directions, growth rates for other modes, particularly public transport have been more substantial, in part reflecting the smaller numbers from which the growth has occurred. The private transport share has therefore declined, southbound from 82 per cent of commuting movements in 2001 to 74 per cent in 2013 and northbound from 92 per cent to 83 per cent. Over the same period, the public transport share has increased from 11 per cent to 18 per cent southbound and from 4 per cent to 9 per cent northbound.

- Over the period from 2006-2013, the absolute growth in public transport commuting in the southbound direction has been greater than that for private transport, in part at least reflecting the effects of the Busway.

- While the numbers are relatively small, the percentage increases in recorded active mode movements have been substantial. These would typically include ferry as part of the journey but would represent longer distance walking or cycling movements to and/or from the ferry.

10.4 Movements by Disaggregated Area

As indicated earlier the areas north and south of the harbour were each divided into two to allow investigation of the different trip patterns associated with each of these. This analysis has focussed on the dominant north to south flow, and the results are set out in Table 10.3 and selected results for 2013 summarised in Figure 10.4.

Table 10.3
Cross Harbour Commuting Trips by Disaggregated Area

Direction (1)	Trips			Modal Share			Total Growth over Period		
	2001	2006	2013	2001	2006	2013	2001-2006	2006-2013	2001-2013
Total									
Outer Nth to CBD	915	1,209	1,545				32%	28%	69%
Inner Nth to CBD	10,593	11,820	12,819				12%	8%	21%
North to CBD	11,508	13,029	14,364				13%	10%	25%
Outer Nth to Isthmus	1,380	1,674	2,286				21%	37%	66%
Inner Nth to Isthmus	11,688	12,591	14,406				8%	14%	23%
North to Isthmus	13,068	14,265	16,692				9%	17%	28%
Outer North to South	348	450	729				29%	62%	109%
Inner North to South	2,706	2,961	3,738				9%	26%	38%
North to South	3,054	3,411	4,467				12%	31%	46%
Private Transport									
Outer Nth to CBD	693	768	960	76%	64%	62%	11%	25%	39%
Inner Nth to CBD	7,050	7,062	6,720	67%	60%	52%	0%	-5%	-5%
North to CBD	7,743	7,830	7,680	67%	60%	53%	1%	-2%	-1%
Outer Nth to Isthmus	1,293	1,533	2,082	94%	92%	91%	19%	36%	61%
Inner Nth to Isthmus	10,713	11,355	12,363	92%	90%	86%	6%	9%	15%
North to Isthmus	12,006	12,888	14,445	92%	90%	87%	7%	12%	20%
Outer North to South	321	429	651	92%	95%	89%	34%	52%	103%
Inner North to South	2,541	2,706	3,360	94%	91%	90%	6%	24%	32%
North to South	2,862	3,135	4,011	94%	92%	90%	10%	28%	40%
Public Transport									
Outer Nth to CBD	159	288	405	17%	24%	26%	81%	41%	155%
Inner Nth to CBD	2,268	2,979	4,425	21%	25%	35%	31%	49%	95%
North to CBD	2,427	3,267	4,830	21%	25%	34%	35%	48%	99%
Outer Nth to Isthmus	54	54	93	4%	3%	4%	0%	72%	72%
Inner Nth to Isthmus	522	543	1,224	4%	4%	8%	4%	125%	134%
North to Isthmus	576	597	1,317	4%	4%	8%	4%	121%	129%
Outer North to South	6	6	30	2%	1%	4%	0%	400%	400%
Inner North to South	57	117	177	2%	4%	5%	105%	51%	211%
North to South	63	123	207	2%	4%	5%	95%	68%	229%
Active Modes									
Outer Nth to CBD	9	9	24	1.0%	0.7%	1.6%	0%	167%	167%
Inner Nth to CBD	114	126	156	1.1%	1.1%	1.2%	11%	24%	37%
North to CBD	123	135	180	1.1%	1.0%	1.3%	10%	33%	46%
Outer Nth to Isthmus	12	..C	21	0.9%	0.2%	0.9%	-75%	600%	75%
Inner Nth to Isthmus	78	126	177	0.7%	1.0%	1.2%	62%	40%	127%
North to Isthmus	90	129	198	0.7%	0.9%	1.2%	43%	53%	120%
Outer North to South	..C	..C	9	0.9%	0.7%	1.2%	0%	200%	200%
Inner North to South	18	15	54	0.7%	0.5%	1.4%	-17%	260%	200%
North to South	21	18	63	0.7%	0.5%	1.4%	-14%	250%	200%

Notes (1) The areas are defined as follows

- Outer North - North and east Rodney
- Inner North - Former North Shore City
- Isthmus - Former Auckland City excluding the CBD
- South - Areas to the south, former Manukau City and Papakura and Franklin districts
- CBD

To preserve confidentiality, numbers recorded as less than 6 have been represented as ..C

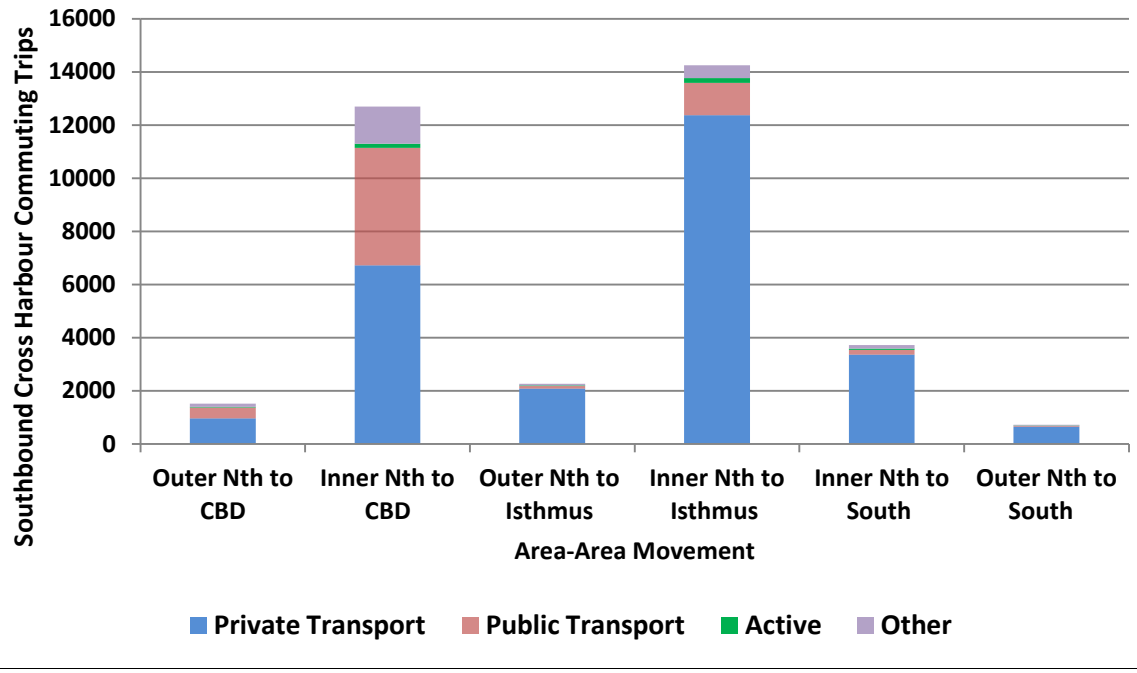


Figure 10.4
2013 North-South Cross Harbour Commuting Trips by Mode and Area

For the position in 2013 the main points emerging from this table and figure include:-

- Overall commuting movements southbound across the harbour are dominated by movements between North Shore and the Isthmus, which account for about 77 per cent of the total. Of these slightly less than half are to the CBD with the remainder to other destinations within the former Auckland City.

- For the shortest movements, between North Shore and the CBD, the share of public transport is relatively high at about 35 per cent of the total commuting flow. This accounts for about 70 per cent of all southbound cross-harbour movements by public transport. The modal share for the longer movement from the Outer North to the CBD is also high at 26 per cent, but this movement is small and this only represents about 6 per cent of public transport movements. The other significant public transport flow is between North Shore and the rest of the Isthmus, where it represents about 20 per cent of total cross-harbour public transport movements but only about 8 per cent of the total southbound movement between these locations.

- For all the other movements the share of public transport is very small at 4 to 5 per cent.

The shares of total cross-harbour public and private transport commuting flows by area to area movement are set out in Figure 10.5.

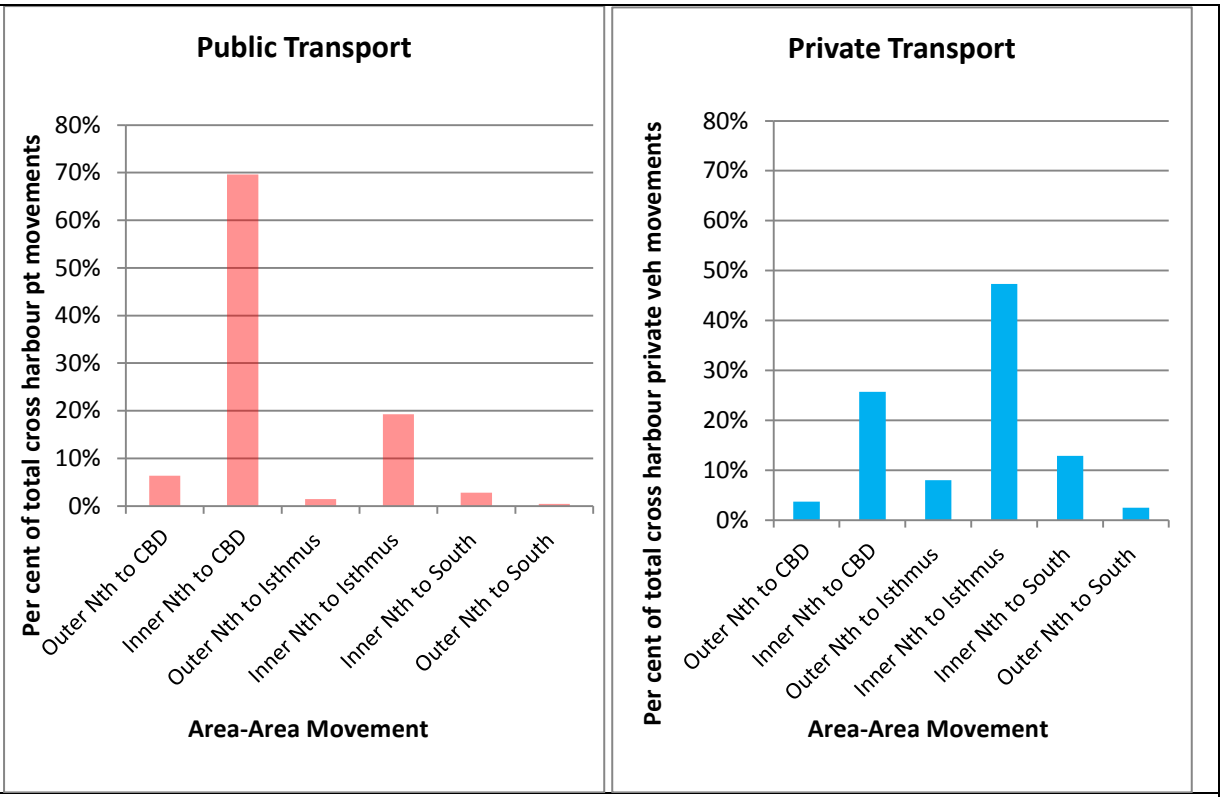


Figure 10.5
Breakdown of Total Cross-Harbour Commuting Flows by Area-Area Movement for Private and Public Transport 2013

- Public transport movements across the harbour are dominated by the flows to the CBD which account for about 75 per cent of the total.

- For private transport, the largest flow is between the North Shore (Inner North) and the rest of the Isthmus which accounts for almost 50 per cent of the southbound private transport commuting across the harbour. Commuting to the CBD accounts for about 25 per cent of the total.

- Movements to and from the areas away from the Isthmus account for about 25 per cent of southbound private transport trips but only about 10 per cent of public transport movements.

Some highlights of the growth to 2013 are set out in Figure 10.6 which looks at the changes in the total numbers of cross-harbour commuting flows by public and private transport and in Figure 10.7 which shows the relative rates of growth over the period from 2006 to 2013.

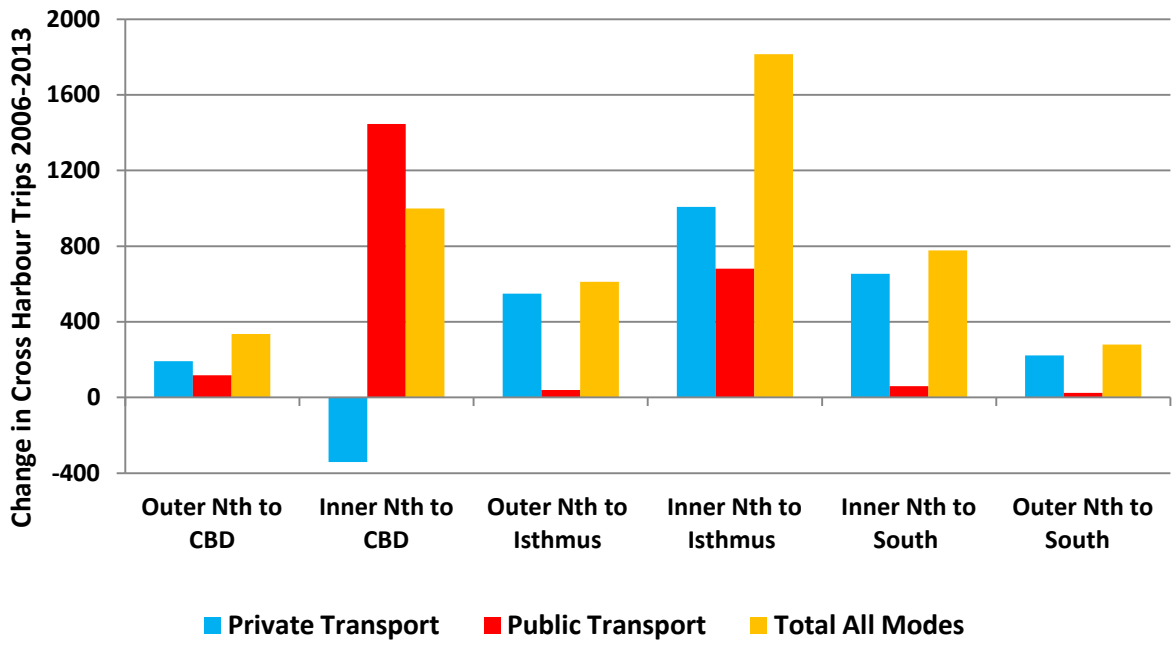


Figure 10.6
Cross Harbour Commuting : Changes in Total Public and Private Transport Flows 2006-2013

Looking at the absolute growth the main points that emerge include:-

- The highest growth in absolute terms has been between the Inner North and Isthmus (excluding the CBD). For this flow, both private and public transport commuting flows have increased with private transport accounting for about 56 per cent of the growth and public transport 38 per cent.

- In contrast, growth in the commuting flows into the CBD from Inner North, the second largest increase in absolute terms, is dominated by public transport with private transport flows declining.

- For all the other cross-harbour commuting movements, the growth is dominated by private transport flows which for movements not to the CBD account for almost all the increase.

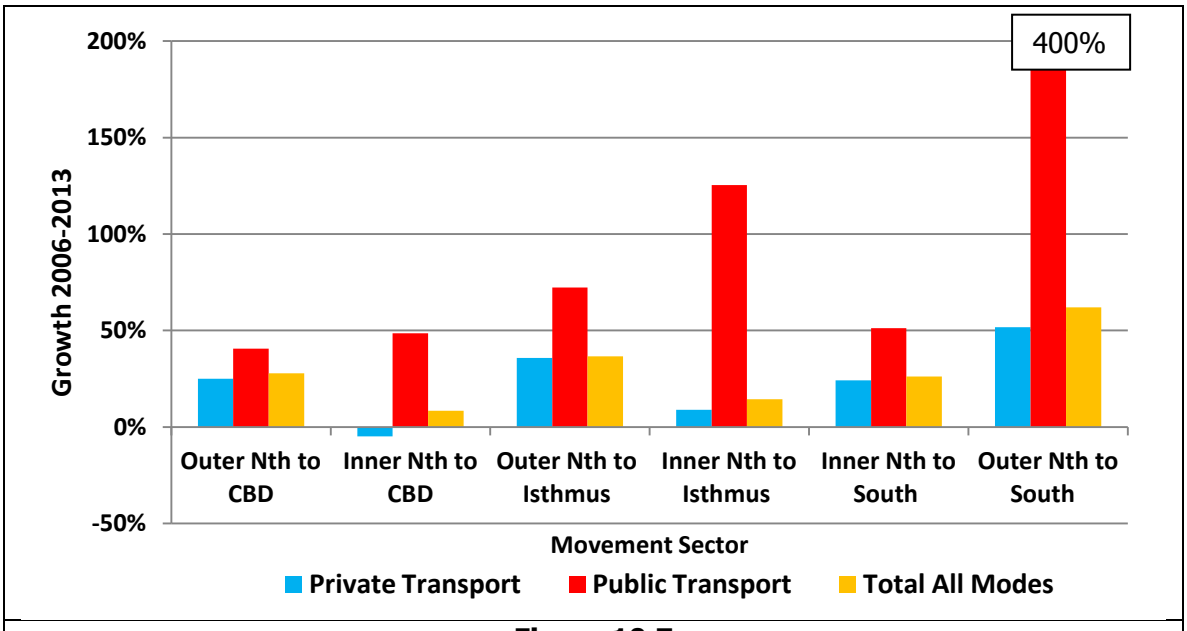


Figure 10.7
Cross Harbour Commuting : Percentage Growth in Public and Private Transport Flows 2006-2013

The key points from Figure 10.7 include:-

- While the major flows across the harbour between Inner North and the CBD and Inner North and the rest of the Isthmus have grown relatively slowly, the smaller movements to or from the more peripheral areas have grown much more substantially.

- For all of the defined sector – sector movements southbound across the harbour, public transport movements have grown more strongly than those for private transport, although for some of these, particularly the longer movements, the number of public transport movements and their share of the total is small.

10.5 Overall Assessment

Cross harbour traffic has grown substantially over the period from 2001, with typically higher growth occurring in the period between 2006 and 2013, despite a general slowdown for the Region as a whole. While there has been significant growth in trips travelling to workplaces south of the harbour, there has been much stronger growth in the reverse direction, although the numbers are much lower.

Commuting travel across the harbour is dominated by private vehicle traffic in both directions. However, the numbers using public transport have increased substantially supported by the construction of the Northern Busway and the modal share of private transport has declined, although overall the numbers have continued to increase.

The majority of movements across the harbour are relatively short distance, for which public transport has a relatively large share. However, for the longer distance movements to or from the more peripheral areas where growth has been particularly marked, the share of private transport is very high and the role of public transport very limited.

APPENDIX A

DETAILED LOCAL BOARD COMMUTING PATTERNS 2013

Table 1
Local Board Commuting Patterns 2013 : Total Trips

		Destination																			
		Albert-Eden	Devonport-Takapuna	Franklin	Henderson-Massey	Hibiscus and Bays	Howick	Kaipatiki	Mangere-Otahuhu	Manurewa	Maunga-kiekie-Tamaki	Orakei	Otara-Papatoetoe	Papakura	Puketapapa	Rodney	Upper Harbour	Waitakere Ranges	Waitemata	Whau	Grand Total
Origin	Albert-Eden	9951	840	162	891	168	855	573	1323	231	2769	1731	930	171	939	237	807	219	13728	978	37503
	Devonport-Takapuna	630	8661	60	297	528	219	1719	240	42	705	381	195	72	84	234	2310	48	5436	177	22038
	Franklin	336	135	12210	105	57	1770	126	1293	714	1653	450	1905	1617	93	63	207	33	1509	120	24396
	Henderson-Massey	2067	777	120	11637	258	504	783	786	138	1839	756	450	141	507	654	2091	1128	6657	2931	34224
	Hibiscus and Bays	678	3132	81	525	11706	300	2115	387	102	978	456	255	60	105	1023	6135	99	4878	330	33345
	Howick	1437	417	681	381	165	18618	387	3027	1023	6630	2220	4299	639	285	168	678	93	6372	387	47907
	Kaipatiki	984	3843	114	435	714	417	8931	453	99	1227	669	312	84	183	309	3792	93	7260	366	30285
	Mangere-Otahuhu	639	150	204	168	72	1320	123	5940	537	3129	624	2325	240	384	75	231	57	1782	246	18246
	Manurewa	477	171	660	147	87	2280	171	2640	4347	2799	708	3837	1236	183	63	294	51	1833	213	22197
	Maungakiekie-Tamaki	1320	264	129	234	78	1437	228	1464	312	7107	1929	1044	183	474	90	375	57	4638	315	21678
	Orakei	1998	603	231	300	129	1323	387	1038	249	4002	9843	987	180	270	162	633	93	11433	354	34215
	Otara-Papatoetoe	405	126	282	192	87	2388	108	2673	915	2403	540	5301	375	141	60	243	30	1524	177	17970
	Papakura	246	114	966	84	57	1080	87	1143	867	1365	324	1584	3993	57	66	123	27	1086	84	13353
	Puketapapa	2082	273	87	438	42	558	198	1218	180	2085	786	678	111	3324	87	324	138	4785	840	18234
	Rodney	399	687	57	822	1248	123	621	156	45	417	225	111	42	81	11022	1980	165	1899	426	20526
	Upper Harbour	639	2166	57	1149	897	291	2028	378	78	771	405	207	60	108	450	8637	93	3924	498	22836
	Waitakere Ranges	1242	318	60	2655	72	243	258	594	60	1134	492	303	51	354	249	567	4170	3654	2169	18645
	Waitemata	2040	966	189	567	216	561	645	621	132	1596	1218	489	90	291	198	912	123	22773	501	34128
	Whau	2241	405	81	1770	114	519	408	1047	144	1827	783	531	102	933	171	612	549	6249	5898	24384
	Grand Total	29811	24048	16431	22797	16695	34806	19896	26421	10215	44436	24540	25743	9447	8796	15381	30951	7266	111420	17010	496110

Note : To preserve confidentiality, numbers recorded as less than 6 have been represented as ..C

Table 2
Local Board Commuting Patterns 2013 : Private Transport

		Destination																			
		Albert-Eden	Devonport-Takapuna	Franklin	Henderson-Massey	Hibiscus and Bays	Howick	Kaipatiki	Mangere-Otahuhu	Manurewa	Maunga-kiekie-Tamaki	Orakei	Otara-Papatoetoe	Papakura	Puketapapa	Rodney	Upper Harbour	Waitakere Ranges	Waitemata	Whau	Grand Total
Origin	Albert-Eden	4962	699	129	756	132	798	468	1179	204	2427	1419	855	147	771	174	699	198	8517	837	25371
	Devonport-Takapuna	540	4506	30	264	468	192	1470	216	30	621	327	174	51	66	189	2106	48	2871	162	14331
	Franklin	309	123	7791	102	51	1707	114	1224	684	1587	408	1776	1551	87	63	186	30	1110	114	19017
	Henderson-Massey	1815	720	108	8316	246	480	753	750	138	1713	675	414	141	468	615	1965	1035	5166	2634	28152
	Hibiscus and Bays	624	2814	72	492	7272	282	1944	360	90	915	429	234	60	93	942	5682	93	3144	318	25860
	Howick	1350	393	636	363	150	13707	360	2922	999	6303	2070	4062	615	270	156	633	93	4785	372	40239
	Kaipatiki	891	3285	63	405	657	396	5508	408	93	1116	591	297	78	159	279	3438	87	4704	342	22797
	Mangere-Otahuhu	549	123	177	144	63	1206	108	4227	477	2730	522	2019	219	342	63	204	45	1227	213	14658
	Manurewa	423	162	618	135	72	2175	147	2478	2877	2586	597	3444	1101	165	51	267	48	1338	198	18882
	Maungakiekie-Tamaki	1164	231	114	207	66	1284	195	1278	285	4833	1575	948	174	396	78	324	57	3159	273	16641
	Orakei	1782	507	210	273	111	1254	348	951	234	3603	5175	885	159	243	132	573	72	8187	324	25023
	Otara-Papatoetoe	351	111	255	171	69	2142	96	2367	780	2154	456	3765	318	132	54	213	30	1026	165	14655
	Papakura	216	99	888	75	48	1041	60	1038	798	1269	261	1407	2706	54	60	114	27	729	78	10968
	Puketapapa	1785	225	72	396	39	519	165	1152	165	1878	684	651	96	1788	75	285	114	3255	756	14100
	Rodney	378	627	54	771	1167	120	594	150	36	405	210	105	30	75	6066	1917	153	1593	399	14850
	Upper Harbour	588	1929	42	1083	825	270	1866	345	72	741	369	192	39	102	417	5703	84	2703	462	17832
	Waitakere Ranges	1059	291	51	2436	66	237	228	555	54	1083	438	288	45	342	228	528	2043	2787	1998	14757
	Waitemata	1335	612	87	453	144	444	423	462	108	1149	822	411	69	192	123	669	87	7347	360	15297
	Whau	1887	357	69	1533	99	495	375	1002	138	1674	672	498	90	798	147	543	468	4362	3612	18819
	Grand Total	22008	17814	11466	18375	11745	28749	15222	23064	8262	38787	17700	22425	7689	6543	9912	26049	4812	68010	13617	372249

Note : To preserve confidentiality, numbers recorded as less than 6 have been represented as ..C

Table 3
Local Board Commuting Patterns 2013 : Public Transport

		Destination																			
		Albert-Eden	Devonport-Takapuna	Franklin	Henderson-Massey	Hibiscus and Bays	Howick	Kaipatiki	Mangere-Otahuhu	Manurewa	Maunga-kiekie-Tamaki	Orakei	Otara-Papatoetoe	Papakura	Puketapapa	Rodney	Upper Harbour	Waitakere Ranges	Waitemata	Whau	Grand Total
Origin	Albert-Eden	453	93	21	84	12	21	51	57	9	165	141	39	21	60	36	57	9	3591	69	4989
	Devonport-Takapuna	24	312	9	6	21	9	66	6	6	36	24	12	..C	..C	21	69	..C	1203	6	1836
	Franklin	15	6	57	..C	..C	9	..C	18	9	18	15	84	9	..C	..C	6	..C	186	..C	438
	Henderson-Massey	129	24	9	303	9	9	15	15	..C	48	45	12	..C	21	12	36	36	1131	153	2007
	Hibiscus and Bays	21	216	..C	12	234	9	81	15	9	24	12	6	..C	..C	39	189	..C	1437	..C	2307
	Howick	57	18	9	6	9	303	9	33	..C	135	90	90	9	..C	6	12	..C	954	6	1749
	Kaipatiki	60	309	36	12	33	15	390	18	..C	63	42	9	..C	18	24	219	..C	2037	9	3300
	Mangere-Otahuhu	45	18	9	6	..C	33	9	165	24	186	60	63	..C	18	9	12	..C	429	15	1110
	Manurewa	27	..C	6	6	6	42	18	63	78	102	78	162	36	6	6	6	..C	414	..C	1062
	Maungakiekie-Tamaki	81	15	12	12	9	57	15	102	18	270	156	63	6	33	12	15	..C	1149	18	2043
	Orakei	87	45	9	9	9	6	27	54	9	141	258	78	9	15	24	36	6	2265	21	3108
	Otara-Papatoetoe	33	6	6	..C	..C	60	6	132	57	132	57	141	21	..C	..C	..C	..C	417	9	1089
	Papakura	9	9	12	..C	..C	15	9	45	24	57	51	108	81	..C	..C	6	..C	300	..C	741
	Puketapapa	150	21	15	21	..C	18	24	27	6	105	63	15	12	87	12	30	15	1311	48	1980
	Rodney	9	21	..C	9	12	..C	12	..C	..C	9	..C	..C	..C	..C	54	15	..C	177	..C	336
	Upper Harbour	33	144	12	18	30	6	87	15	..C	6	15	..C	..C	..C	9	162	..C	1029	6	1572
	Waitakere Ranges	102	12	9	111	..C	..C	12	18	..C	18	33	..C	..C	6	15	15	69	702	84	1212
	Waitemata	348	207	24	66	24	45	132	75	18	234	288	57	6	57	21	123	15	2775	84	4599
	Whau	198	33	9	147	6	6	27	21	6	96	72	12	6	69	15	39	27	1512	213	2514
	Grand Total	1881	1512	270	837	420	663	993	879	282	1845	1503	954	228	402	321	1050	183	23019	750	37992

Note : Numbers recorded as less than 6 have been represented as ..C

Table 4
Local Board Commuting Patterns 2013 : Active Modes

		Destination																			
		Albert-Eden	Devonport-Takapuna	Franklin	Henderson-Massey	Hibiscus and Bays	Howick	Kaipatiki	Mangere-Otahuhu	Manurewa	Maunga-kiekie-Tamaki	Orakei	Otara-Papatoetoe	Papakura	Puketapapa	Rodney	Upper Harbour	Waitakere Ranges	Waitemata	Whau	Grand Total
Origin	Albert-Eden	1356	21	9	24	9	12	33	33	9	117	126	12	..C	81	12	24	..C	1152	48	3078
	Devonport-Takapuna	24	1278	..C	12	21	6	132	..C	..C	6	9	..C	15	..C	9	57	..C	159	..C	1740
	Franklin	..C	..C	678	..C	..C	6	..C	21	..C	..C	..C	..C	12	..C	..C	..C	..C	18	6	759
	Henderson-Massey	30	18	..C	864	..C	6	6	..C	..C	12	..C	9	..C	6	..C	39	33	123	48	1200
	Hibiscus and Bays	9	36	..C	6	606	..C	6	..C	..C	9	..C	..C	..C	6	21	126	..C	45	..C	876
	Howick	6	..C	6	6	..C	846	..C	15	12	60	21	45	6	6	..C	9	..C	66	..C	1113
	Kaipatiki	9	147	..C	..C	9	..C	663	9	..C	6	..C	..C	..C	..C	6	42	..C	45	6	954
	Mangere-Otahuhu	12	..C	6	..C	..C	18	..C	501	..C	45	6	90	..C	..C	..C	..C	..C	30	..C	717
	Manurewa	6	..C	6	..C	..C	12	..C	12	336	6	..C	69	36	..C	..C	..C	..C	6	..C	498
	Maungakiekie-Tamaki	42	6	..C	6	..C	21	9	42	6	660	126	9	..C	33	..C	24	..C	141	6	1134
	Orakei	57	18	6	15	6	27	6	9	..C	147	663	6	6	..C	..C	..C	..C	627	..C	1608
	Otara-Papatoetoe	6	..C	..C	..C	..C	54	..C	42	21	6	..C	471	6	..C	..C	9	..C	6	..C	633
	Papakura	..C	..C	36	..C	..C	..C	6	12	18	..C	..C	12	351	..C	..C	..C	..C	9	..C	465
	Puketapapa	69	9	..C	..C	..C	9	..C	12	9	54	15	..C	..C	282	..C	..C	..C	72	12	552
	Rodney	..C	9	..C	9	6	..C	..C	..C	..C	..C	..C	..C	9	..C	537	15	..C	27	..C	624
	Upper Harbour	9	36	..C	21	15	9	39	..C	..C	..C	..C	6	15	..C	15	591	..C	18	12	795
	Waitakere Ranges	18	..C	..C	39	..C	..C	6	..C	..C	9	..C	..C	..C	..C	..C	9	183	60	33	372
	Waitemata	285	99	69	33	33	60	72	51	..C	147	63	18	9	30	48	84	12	9162	33	10311
	Whau	72	..C	..C	33	..C	6	..C	12	..C	12	12	..C	..C	39	..C	9	30	141	516	888
	Grand Total	2016	1692	822	1074	717	1095	987	780	429	1299	1065	753	474	504	657	1047	273	11907	726	28317

Note : Numbers recorded as less than 6 have been represented as ..C

Table 5
Local Board Commuting Patterns 2013 : Work at Home

		Destination																			
		Albert-Eden	Devonport-Takapuna	Franklin	Henderson-Massey	Hibiscus and Bays	Howick	Kaipatiki	Mangere-Otahuhu	Manurewa	Maunga-kiekie-Tamaki	Orakei	Otara-Papatoetoe	Papakura	Puketapapa	Rodney	Upper Harbour	Waitakere Ranges	Waitemata	Whau	Grand Total
Origin	Albert-Eden	2826	6	..C	9	..C	..C	6	9	..C	21	6	..C	..C	..C	..C	12	..C	105	9	3024
	Devonport-Takapuna	12	2226	..C	6	..C	6	12	..C	..C	..C	..C	..C	..C	..C	..C	33	..C	63	..C	2367
	Franklin	..C	..C	3336	..C	..C	9	..C	12	..C	15	12	18	21	..C	..C	6	..C	27	..C	3462
	Henderson-Massey	24	6	..C	1716	..C	..C	..C	..C	..C	12	9	..C	..C	..C	6	9	..C	54	12	1851
	Hibiscus and Bays	12	27	..C	..C	3321	..C	36	..C	..C	9	9	6	..C	..C	..C	27	..C	75	9	3549
	Howick	..C	..C	9	..C	..C	3318	..C	21	6	30	6	27	..C	..C	6	..C	..C	48	..C	3480
	Kaipatiki	..C	12	..C	..C	6	..C	2085	..C	..C	21	..C	..C	..C	..C	..C	24	..C	60	..C	2223
	Mangere-Otahuhu	9	..C	..C	..C	..C	..C	..C	666	..C	6	..C	18	..C	..C	..C	..C	..C	12	..C	723
	Manurewa	..C	..C	9	..C	..C	6	..C	6	819	18	..C	30	12	..C	..C	..C	..C	12	..C	918
	Maungakiekie-Tamaki	..C	..C	..C	..C	..C	6	..C	..C	..C	1074	6	..C	..C	..C	..C	6	..C	45	..C	1152
	Orakei	27	12	..C	..C	..C	9	6	..C	..C	24	3465	..C	..C	..C	..C	..C	6	96	..C	3660
	Otara-Papatoetoe	..C	..C	..C	..C	..C	18	..C	21	9	6	..C	582	6	..C	..C	..C	..C	9	..C	660
	Papakura	6	..C	9	..C	..C	6	6	6	12	9	6	12	690	..C	..C	..C	..C	27	..C	795
	Puketapapa	15	..C	..C	..C	..C	..C	..C	..C	..C	9	12	..C	..C	1029	..C	..C	..C	30	6	1113
	Rodney	..C	9	..C	12	30	..C	..C	6	6	..C	..C	..C	..C	..C	3924	9	..C	39	12	4059
	Upper Harbour	..C	24	..C	9	9	..C	6	6	..C	18	..C	..C	..C	..C	..C	1980	..C	42	9	2112
	Waitakere Ranges	27	..C	..C	12	..C	..C	..C	9	..C	6	6	..C	..C	..C	..C	..C	1743	36	9	1857
	Waitemata	21	..C	..C	9	..C	..C	..C	9	..C	12	12	..C	6	..C	..C	9	..C	2775	9	2874
	Whau	12	..C	..C	6	..C	..C	..C	..C	..C	12	..C	..C	..C	..C	..C	..C	..C	39	1344	1428
	Grand Total	3012	2331	3375	1794	3384	3390	2166	783	861	1308	3555	702	741	1047	3951	2127	1761	3594	1425	41307

Note : To preserve confidentiality, numbers recorded as less than 6 have been represented as ..C

Table 6
Local Board Commuting Patterns 2013 : Public Bus

		Destination																			
		Albert-Eden	Devonport-Takapuna	Franklin	Henderson-Massey	Hibiscus and Bays	Howick	Kaipatiki	Mangere-Otahuhu	Manurewa	Maunga-kiekie-Tamaki	Orakei	Otara-Papatoetoe	Papakura	Puketapapa	Rodney	Upper Harbour	Waitakere Ranges	Waitemata	Whau	Grand Total
Origin	Albert-Eden	402	75	21	36	9	18	51	48	6	129	108	21	12	57	33	48	..C	3027	57	4161
	Devonport-Takapuna	24	312	9	6	21	9	66	6	..C	27	12	6	..C	..C	21	69	..C	1197	6	1800
	Franklin	..C	..C	24	..C	..C	6	..C	..C	6	6	..C	12	..C	..C	..C	..C	..C	12	..C	78
	Henderson-Massey	69	21	6	243	..C	9	12	12	..C	18	21	9	..C	18	9	24	30	732	84	1320
	Hibiscus and Bays	21	213	..C	12	231	9	81	15	9	21	12	6	..C	..C	39	189	..C	1425	..C	2286
	Howick	51	15	6	6	9	294	9	33	..C	126	87	78	..C	..C	..C	9	..C	636	6	1374
	Kaipatiki	60	306	36	12	33	15	390	18	..C	57	36	6	..C	18	24	219	..C	2034	9	3279
	Mangere-Otahuhu	42	15	..C	..C	..C	30	6	144	12	159	24	63	..C	18	6	12	..C	219	12	771
	Manurewa	..C	..C	..C	..C	6	39	12	36	63	27	9	84	12	..C	..C	..C	..C	51	..C	351
	Maungakiekie-Tamaki	63	12	6	9	..C	54	9	72	9	204	132	21	..C	30	9	12	..C	609	15	1272
	Orakei	72	27	6	..C	6	..C	21	24	..C	96	204	6	6	12	12	33	..C	1341	9	1887
	Otara-Papatoetoe	12	..C	6	..C	..C	60	..C	120	33	84	33	99	9	..C	..C	..C	..C	123	9	603
	Papakura	6	6	..C	..C	..C	6	..C	9	6	9	9	12	54	..C	..C	..C	..C	33	..C	159
	Puketapapa	150	21	15	18	..C	18	24	27	..C	105	60	12	12	87	12	30	12	1293	48	1944
	Rodney	..C	21	..C	6	12	..C	12	..C	..C	6	..C	..C	..C	..C	48	15	..C	171	..C	306
	Upper Harbour	33	144	12	18	30	6	87	12	..C	6	15	..C	..C	..C	9	162	..C	1029	6	1569
	Waitakere Ranges	24	9	..C	60	..C	..C	..C	9	..C	9	..C	..C	..C	6	12	6	39	246	66	495
	Waitemata	327	207	21	48	24	39	132	57	..C	126	213	15	6	57	21	120	15	2643	69	4143
	Whau	141	27	9	87	6	6	21	18	..C	75	33	9	..C	69	12	33	21	1056	180	1806
	Grand Total	1500	1440	192	573	396	621	936	660	162	1290	1011	459	132	381	273	990	129	17877	582	29604

Note : To preserve confidentiality, numbers recorded as less than 6 have been represented as ..C

Table 7
Local Board Commuting Patterns 2013 : Train

		Destination																			
		Albert-Eden	Devonport-Takapuna	Franklin	Henderson-Massey	Hibiscus and Bays	Howick	Kaipatiki	Mangere-Otahuhu	Manurewa	Maunga-kiekie-Tamaki	Orakei	Otara-Papatoetoe	Papakura	Puketapapa	Rodney	Upper Harbour	Waitakere Ranges	Waitemata	Whau	Grand Total
Origin	Albert-Eden	51	18	..C	48	..C	..C	..C	9	..C	36	33	18	9	..C	..C	9	6	564	12	828
	Devonport-Takapuna	..C	..C	..C	..C	..C	..C	..C	..C	..C	9	12	6	..C	..C	..C	..C	..C	6	..C	36
	Franklin	12	..C	33	..C	..C	..C	..C	18	..C	12	15	72	6	..C	..C	..C	..C	174	..C	360
	Henderson-Massey	60	..C	..C	60	6	..C	..C	..C	..C	30	24	..C	..C	..C	..C	12	6	399	69	687
	Hibiscus and Bays	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	12	..C	21
	Howick	6	..C	..C	..C	..C	9	..C	..C	..C	9	..C	12	6	..C	..C	..C	..C	318	..C	375
	Kaipatiki	..C	..C	..C	..C	..C	..C	..C	..C	..C	6	6	..C	..C	..C	..C	..C	..C	..C	..C	21
	Mangere-Otahuhu	..C	..C	6	..C	..C	..C	..C	21	12	27	36	..C	..C	..C	..C	..C	..C	210	..C	339
	Manurewa	27	..C	6	..C	..C	..C	6	27	15	75	69	78	24	6	6	..C	..C	363	..C	711
	Maungakiekie-Tamaki	18	..C	6	..C	6	..C	6	30	9	66	24	42	..C	..C	..C	..C	..C	540	..C	771
	Orakei	15	18	..C	6	..C	..C	6	30	6	45	54	72	..C	..C	12	..C	..C	924	12	1221
	Otara-Papatoetoe	21	..C	..C	..C	..C	..C	..C	12	24	48	24	42	12	..C	..C	..C	..C	294	..C	486
	Papakura	..C	..C	9	..C	..C	9	9	36	18	48	42	96	27	..C	..C	..C	..C	267	..C	582
	Puketapapa	..C	..C	..C	..C	..C	..C	..C	..C	6	..C	..C	..C	..C	..C	..C	..C	..C	18	..C	36
	Rodney	9	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	6	..C	..C	6	..C	30
	Upper Harbour	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C	..C
	Waitakere Ranges	78	..C	6	51	..C	..C	12	9	..C	9	30	..C	..C	..C	..C	9	30	456	18	717
	Waitemata	21	..C	..C	18	..C	6	..C	18	15	108	75	42	..C	..C	..C	..C	..C	132	15	456
	Whau	57	6	..C	60	..C	..C	6	..C	6	21	39	..C	..C	..C	..C	6	6	456	33	708
	Grand Total	381	72	78	264	24	42	57	219	120	555	492	495	96	21	48	60	54	5142	168	8388

Note : To preserve confidentiality, numbers recorded as less than 6 have been represented as ..C

APPENDIX B

IMPACT OF TRANSPORT INVESTMENT ON LAND USE

B Impact of Transport Investment on Land use

B1. Introduction

Work by Grimes and Young published in 2010[8] established that house prices near the Waitakere City Western Line rose following the announcement of the upgrades of the line in mid 2005. It is therefore possible that the increasing value of houses in the catchment area of the rail line will have encouraged the construction of additional dwellings in the area, resulting in increases in the resident population. These possible changes could arise either from the development of greenfield sites or from increased subdivision of existing sites made economically attractive by the higher values and will therefore be influenced by the availability of these opportunities.

To investigate the extent to which the population in the rail corridor may have grown in response to the investment in rail services, a brief initial analysis has been made using the Census data for 2001, 2006 and 2013. This covers the resident populations of the CAUs within the rail corridors both for the Western Line and for the Southern and Eastern Lines and also broader population estimates to provide a background to the rail corridor figures. The results of this are set out below.

B2. Total Population Growth in the Auckland Region

The total growth of the resident population in the Auckland Region is set out in Table B.1. Because of the particular conditions of the CBD, which has experienced considerable growth but has relatively limited use of rail for commuting by residents (accounting for only about 3 per cent of total rail trips), the totals in this table and the subsequent analysis exclude the population of this area. The table also includes the populations in the former cities and districts through which the rail lines pass.

Table B.1
Growth in Population of the Auckland Region 2001-2013

Area	Total Resident Population			Total Growth	
	2001	2006	2013	2001-2006	2006-2013
Total Region					
Total Auckland exc CBD	1,150,101	1,283,598	1,384,212	11.6%	7.8%
Individual Former Cities or Districts Potentially Impacted by Rail					
Waitakere	169,569	187,281	200,826	10.4%	7.2%
Auckland City exc CBD	349,275	374,631	395,772	7.3%	5.6%
Manukau, Papakura & Franklin	362,478	418,446	453,378	15.4%	8.3%
Combined Areas	881,322	980,358	1,049,976	11.2%	7.1%

For all of the areas identified, the growth rates were higher for the period from 2001 to 2006 than in the subsequent intercensal period. The highest growth rates were experienced in the south, which had rates of increase above the regional averages (excluding the CBD). The growth for Waitakere was slightly below that for the Region as a whole and the rates for the Auckland City area were more substantially below the regional totals (in both cases excluding the CBD).

[8] Grimes A and Young C "Anticipatory Effects of Rail Upgrades: Auckland's Western Line" Motu Working Paper 10-11 September 2010

B3 Population Growth along the Rail Corridors

B3.1 Total Population Growth by Line

The rail corridor has previously been defined in Section 9 (see Figure 9.6) and the population growth in this area broken down by line is set out in Table B.2. For this analysis, Newmarket has been grouped with other areas served by the Southern and Eastern Lines, reflecting the higher number of trains through the station on the Southern Line.

Table B.2
Growth in Population in the Rail Corridors 2001-2013

Area	Total Resident Population			Total Growth	
	2001	2006	2013	2001-2006	2006-2013
Combined Corridors	280,590	312,315	339,801	11.3%	8.8%
Western Line (WL)	87,969	101,430	110,142	15.3%	8.6%
Eastern/Southern/OBLine inc Newmarket (SEL)	192,621	210,885	229,659	9.5%	8.9%

For the period from 2001 to 2006 population growth was faster in the Western Line corridor than the corridor served by the Southern Line but after 2006 the growth rates in the populations served by the two lines are similar, with much lower growth for the Western Line. The overall growth rate in the combined corridor was similar to that for the Region as a whole (excluding the CBD) for 2001 to 2006, 11.3 per cent compared to 11.6 per cent, and slightly faster for the subsequent period to 2013, 8.8 per cent compared to 7.7 per cent.

B3.2 Population Growth by Line Segment

The position in the rail corridor by line has been considered further by considering for the Western Line, growth in the former Waitakere City and Auckland City areas separately. Similarly for the Southern Line, the increases in the former Auckland City and in the areas further south have been considered separately. The results of this are set out Table B.3.

Table B.3
Growth in Population in the Rail Corridors by Former Administrative Area 2001-2013

Area	Total Resident Population			Total Growth	
	2001	2006	2013	2001-2006	2006-2013
Rail corridor WL Waitakere	52,383	61,851	68,037	18.1%	10.0%
Rail corridor WL Auckland City	35,586	39,579	42,105	11.2%	6.4%
Rail corridor SEL Auckland City	92,817	99,393	105,837	7.1%	6.5%
Total rail corridors Auckland City	*128,403*	*138,972*	*147,942*	*8.2%*	*6.5%*
Rail corridor SEL Manukau	99,804	111,492	123,822	11.7%	11.1%

For the corridor served by the Western Line, growth has been substantially faster in the former Waitakere City area than in the more central Auckland City area for both periods. A similar position exists for the Southern and Eastern Lines with population growth closer to the centre being lower than that further south.

It is also noteworthy that for both areas served by the Southern and Eastern Lines, population growth in these over the two periods has been broadly constant. This contrasts with the position for the Western Line where growth in the period from 2001 to 2006 was much higher than that for the following period.

To some extent the growth in population in the rail corridor may reflect the underlying growth in the broader areas as set out in Table B.1. The comparisons are summarised in Table B.4 and Figure B.1.

Table B.4
Growth in Population in the Rail Corridors and Wider Areas 2001-2013

Area	Total Resident Population			Total Growth	
	2001	2006	2013	2001-2006	2006-2013
Rail corridor WL Waitakere	52,383	61,851	68,037	18.1%	10.0%
Total Waitakere City	169,569	187,281	200,826	10.4%	7.2%
Rail corridor WL Auckland City	35,586	39,579	42,105	11.2%	6.4%
Rail corridor SEL Auckland City	92,817	99,393	105,837	7.1%	6.5%
Total rail corridors Auckland City	*128,403*	*138,972*	*147,942*	*8.2%*	*6.5%*
Total Auckland City	349,275	374,631	395,772	7.3%	5.6%
Rail corridor SEL Manukau	99,804	111,492	123,822	11.7%	11.1%
Manukau, Papakura & Franklin	362,478	418,446	453,378	15.4%	8.3%

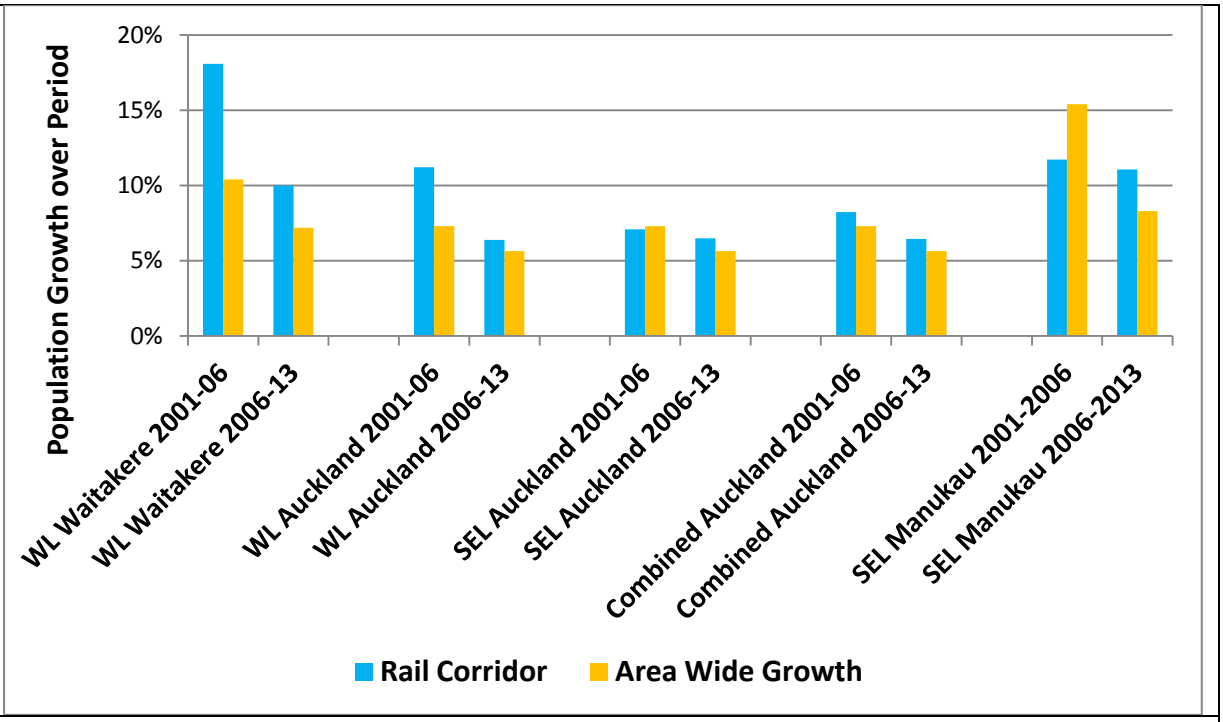


Figure B.1
Comparative Population Growth Rates in the Rail Corridors and Broader Areas, 2001-2006 and 2006-2013

The main conclusions from this are:-

- For the Western Line, population growth in the western part of the rail corridor has been higher than for Waitakere City as a whole but with the difference being higher for the early period before the rail improvements were started than in the later period. However, the difference for this latter period is still substantial with rail corridor growth being about 40 per cent higher than general population growth in the Waitakere City area, although lower than the difference of about 75 per cent in the earlier period.

- For the parts of the rail corridors in Auckland City, growth in the Western Line corridor was relatively high both in relation to growth on the Southern and Eastern Lines and to the general population growth in the area in the period from 2001 to 2006. For the period from 2006 onwards, the rates of growth in the two rail corridors are broadly similar and only slightly higher than the area wide rate of growth.

- For the area to the south, growth in the rail corridor between 2001 and 2006 was substantially lower than the area growth, but that changed after 2006 with rail corridor growth being substantially higher.

B4 Detailed Population Growth from 2006-2013

To look at the position in the corridors and over broader areas at a more detailed level population growth between 2006 and 2013 by CAU is set out in Figure B.2 for percentage growth and Figure B.3 for the absolute growth. In both figures, blue colours represent below average growth while red colours are above average.

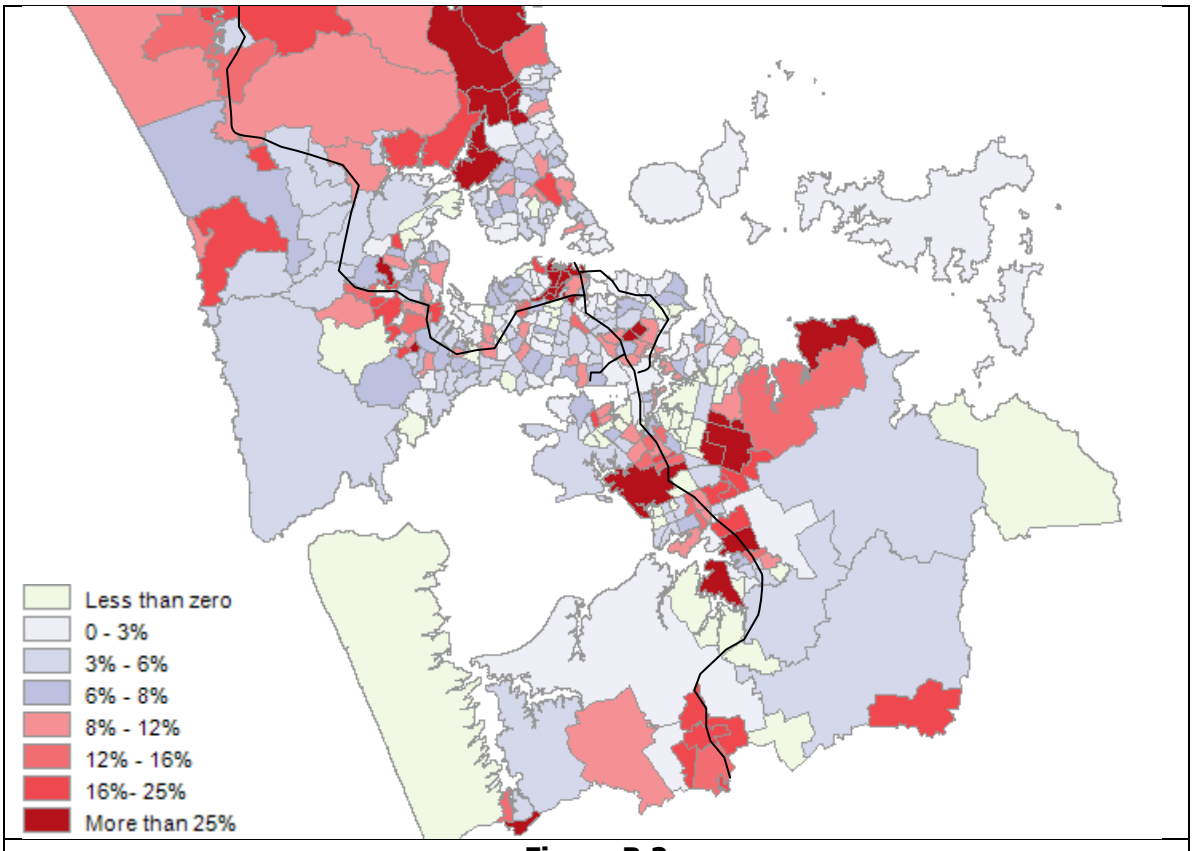


Figure B.2
Population Growth by CAU 2006-2013 : Per Cent Changes

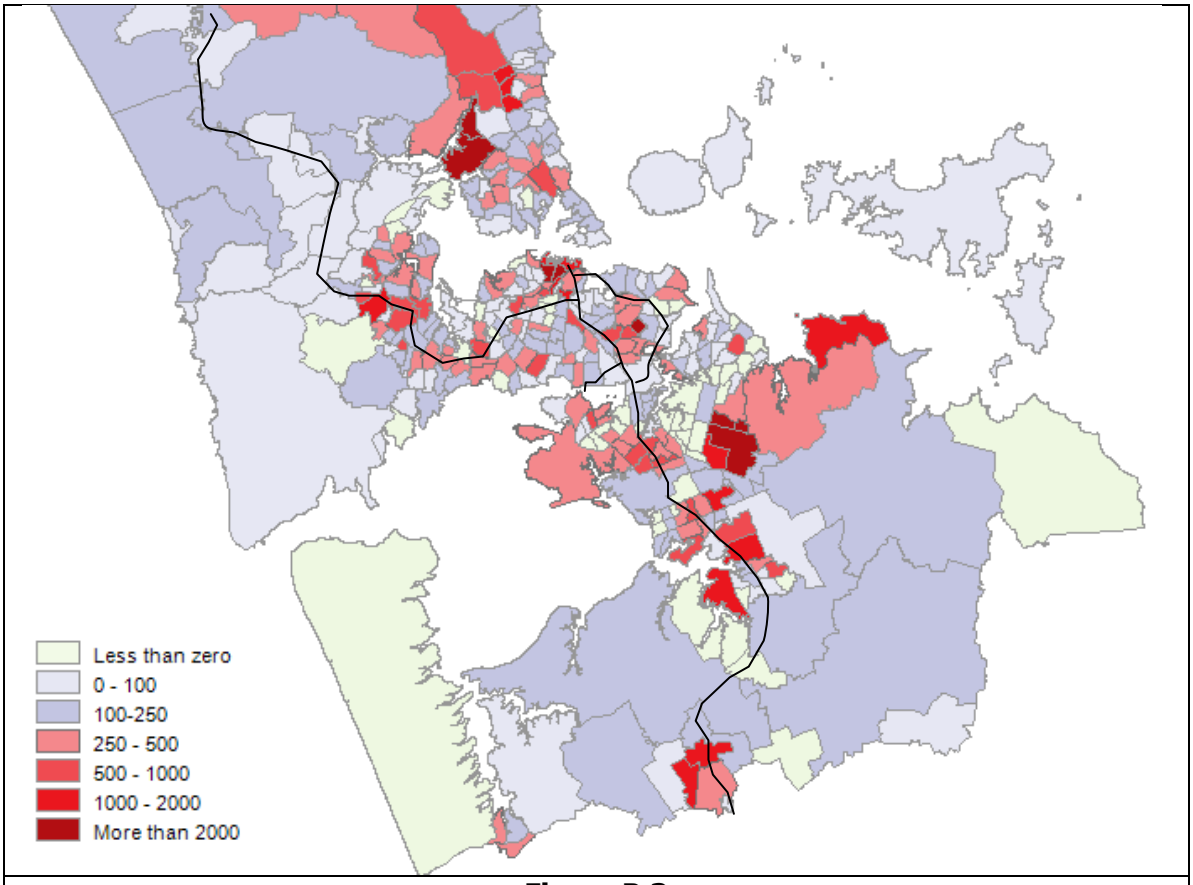


Figure B.3
Population Change by CAU 2006-2013 : Number of Residents

For all the rail corridors, the areas served comprise a mixture of locations which have experienced considerable population growth, such as Sturges North and Takanini South, and a number for which the growth has been more modest, such as Tamaki or has even declined such as Glen Innes West, Mount Eden North and Lynnmall. This growth pattern is likely to reflect a number of factors, of which the increased accessibility offered by the improved rail service is probably only one. Other factors may include availability of sites for new housing, particularly greenfield sites for large-scale increases, natural growth rates and changes in the occupation of existing housing stock. Outside of the rail corridor, the substantial growth that has taken place in areas like Flatbush, Stonefields and Greenhithe appears to reflect the availability of development sites.

For the Southern Line, much of the growth in the rail corridor is concentrated in a few areas, including Takanini, Papakura and Pukekohe[9] and for these, the availability of land for greenfield development may have been the major, or at least a very important, driver of growth. In addition Papakura and Takanini are also located close to SH1 so benefit from good accessibility by both road and rail.

Similarly for the Western Line, there has been substantial growth at locations such as Sturges, Ranui and Swanson where again there have been opportunities for greenfield development. A number of existing Western Line suburbs have also increased, but the pattern is somewhat mixed. Glenavon experienced a large increase, while directly beside it Lynnmall decreased in population.

[9] While there has been substantial growth recorded for Manukau Central most of this is associated with the Women's Prison.

While the presence of rail may act as one of the drivers for the distribution of increases in population around Auckland, further more detailed analysis would be needed to determine the importance of this in comparison to other factors, such as the availability of greenfield sites.

B5 Overall Assessment

The overall message that emerges is therefore mixed. For the Western Line, population growth in the rail corridor in the areas of both Auckland City and Waitakere City has been higher than the background population growth. However, this effect was stronger in the period to 2006 which was before any significant improvement in the rail network had taken place [10] and possibly reflects other factors such as land availability for residential development. Post 2006, as services were improved, the effect appears more muted and much of the growth is in greenfield sites where the availability of land may be the critical factor.

For the Eastern and Southern Lines, population growth in the rail corridor in the Auckland City part was broadly in line with the total population increase but was slightly higher in the period after 2006. For the areas further south, growth in the rail corridor was low in relation to the overall population growth in the area up to 2006 but substantially higher after 2006, but as in the case of the Western Line, much of the growth is in new greenfield development.

Therefore, for the Western Line there appears to have been a lessening of the relative rate of growth in the rail corridor compared to the broader area as services were improved but for the Southern and Eastern Lines the reverse appears to be the case. Overall, further more detailed work would be needed to determine how much of an extent upgrades to the rail corridor lead to these results in comparison to other factors driving the scale and distribution of population growth.

[10] The Grimes study takes 2005Q2 as the point at which large scale improvement might be regarded as committed.