**Introduction**

The 2013 Census data provides the opportunity to examine the current patterns of Auckland commuting and their evolution in response to employment and population changes and to investment in the transport network. The opportunity has also been taken to compare the Auckland findings with data from the Australian cities of Sydney, Melbourne, Perth and Brisbane. A selection of the most important findings from the analysis are summarised below and discussed in more detail in the main report.

The analysis has considered all movements recorded in the Census, including work at home, and in more detail, journeys broken down by origin and destination. Because of issues with determining the destinations of trips at a reasonable level of accuracy, this second dataset is somewhat smaller. Trips to and from the islands and other water areas have been excluded.

**Overall Commuting Patterns**

In 2013, trips by private vehicles (PV) accounted for about 74 per cent of all commuting trips (70 per cent as drivers and 4 per cent as passengers), 5.8 per cent travelled by bus, 1.6 per cent by train, 5.6 per cent by walking and cycling and 7.5 per cent worked at home (Figure 1).

**Figure 1: Commuting by mode 2013**

Since 2001, public transport use has increased by 50 per cent compared to an overall increase in commuting of 23 per cent. Rail patronage has increased quickly, but buses have accounted for the majority of public transport trip growth. The largest increases in public transport patronage occurred after 2006, with bus usage increasing by 19 per cent and rail by 67 per cent. Meanwhile, active modes have increased by 13 per cent since 2006 (Figure 2).

**Figure 2: Total commuting trips 2001-13**
Alongside this growth in public transport use, the share of users of private vehicles has fallen from 75 per cent in 2006 to 74 per cent in 2013. However, this decline reflects a fall in trips by private vehicle passengers rather than by drivers. Importantly, the share of private transport drivers has remained constant at 70 per cent, showing limited impact, at the regional level, in reducing the numbers of private vehicles used for commuting (Figure 3). 

**Figure 3: Change in commuting trips 2006-2013**

Although public transport patronage has grown substantially, Auckland has a low share of public transport use compared to Australian cities. This is to some extent balanced by the shares of active mode trips and of people working at home, both of which are much higher than those in the other selected cities. The overall share of private vehicle trips is similar to those for Perth, Brisbane and Melbourne, but higher than Sydney (Figure 4). 

**Figure 4: Mode splits for Auckland (2013) and Australian cities (2011)**
Commuting by Broad Area

To help analyse commuting patterns, and compare these with Australian cities, the report has divided Auckland into 5 broad areas based on Local Board boundaries (Figure 5).

Figure 5: Area definitions

The CBD accounts for about 14 per cent of all commuting 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.

While the detailed travel patterns for all these areas are set out in the main report, the CBD and Outer Urban areas represent contrasting positions - the CBD as a major and dense employment area with a relatively small number of residents, and the Outer Urban area as a major growth area with dispersed commuting patterns. These characteristics have a key influence on overall traffic patterns in the Region and the two areas are therefore considered as brief case studies in this summary.
The CBD

The CBD has low employment self-sufficiency, with workers resident in the area making up only 10 per cent of the total numbers employed (Figure 6). As a result, flows into the CBD from other parts of the Region are high and this places pressure on the transport network, particularly on the immediate approaches to the CBD. While the main sources of workers are from the Isthmus and the southern North Shore, the high level of employment and the specialised skills required mean that some workers are drawn from across the Region. (Figure 7)

Figure 6: Origins and destinations of commuting trips by sector

Figure 7: Share of workers commuting to the CBD by origin 2013
In the CBD, the high density of employment, the substantial investment in bus and rail and the limited capacity on the main road links complement each other to support a high public transport modal share, which accounted for 27 per cent of journeys into the area in 2013. Active modes are also important, accounting for 12 per cent of trips. However journeys by private vehicles still account for 55 per cent of the total (Figure 8).

Figure 8: Commuting by mode to the CBD 2006 and 2013

The CBD is the largest destination for public transport trips, accounting for 48 per cent of both bus and rail commuting. The CBD also attracted 30 per cent of walking and 21 per cent of cycling trips, but only 10 per cent of private vehicle commuting trips.

Travel to the CBD increased by 13 percent since 2006, and accounted for 19 percent of the regional increase. Public transport accommodated around half the growth in travel to CBD destinations, while the number of private vehicle trips has increased only slowly. In particular, the share of rail has grown substantially, albeit from a small base. Active mode trips accounted for around a third of the new trips into the area.

In terms of spatial distribution, 30 percent of the increase in travel to the CBD since 2006 has come from the CBD itself, mainly from walking trips from new apartment growth. The remainder of growth has come from around the Region but there is no clear pattern of growth reflecting transport investment. Surprisingly, a number of areas have seen a decrease in travel to the CBD, including those immediately to the west of the CBD and in the central Isthmus south of the Western Line. (Figure 9)

Figure 9: Changes in trip making CBD 2006-2013
The Outer Urban Area

Commuting to Outer Urban area jobs has grown rapidly and accounted for 45 per cent of the regional increase between 2006 and 2013. Unlike the CBD, the Outer Urban area has a high level of self-containment (the proportion of total resident workers with jobs in the area in which they live), with 60 per cent of the resident workforce being employed in the area. This means that the bulk of trips from this area do not travel through the chokepoints around the isthmus into the more congested Inner urban area.

The large size of the Outer Urban area, combined with dispersed patterns of commuting and lower availability of public transport services mean that private vehicles form the main means of travel, accounting for 83 per cent of trips (Figure 10). While the overall public transport mode share from the area is low, it does play an important role for trips into the central areas. Bus and rail accommodate around 22 per cent of travel to the central areas, thereby reducing demand for long-distance commuter travel on the motorway network.

Figure 10: Commuting by mode to the outer urban area 2006 and 2013

Over the period from 2006, the shares of commuting trips by mode have been broadly constant, resulting in a substantial net increase in total private transport trips to destinations in the Outer Urban area.

Overall, the commuting patterns typified by these two areas, with substantial commuting into the central areas and a much higher level of self-containment for areas further away from the centre, set the framework for the journey to work patterns and the associated modal shares for the Region as a whole.
Analysis at a Local Board Level

Journey to work patterns were also analysed by Local Board areas (Figure 11). These Board areas range in size, with Howick having the highest number of commuting residents at 48,000 in 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.

Figure 11: Local Board areas

In 2013, the level of self containment in the Local Board areas varied from 18 per cent in Puketapapa to 67 per cent in Waitemata with an average of 35 per cent. The proportion for Waitemata reflected the very high numbers of jobs available within the Board area.
The shares of the different modes used for commuting by Local Board residents vary from Board to Board. Active modes form a high share of travel for Waitemata residents reflecting the large number of jobs within easy access. Public transport has a relatively high share of travel in the central areas of Waitemata, Albert-Eden, Kaipatiki, and Puketapapa. The private transport share is high in the south where commuting patterns are more dispersed (Figure 12).

Between 2006 and 2013, the Waitemata area attracted the largest increase in commuting journeys. Of these, active modes had the largest share accounting for almost half the growth in commuting trips by residents. Public transport accounted for more than 40 per cent of the growth in the lower part of the North Shore and in the central areas of the Isthmus (except for Waitemata where the share of active modes was very high). The share of private transport in total growth was above 80 per cent for the Local Boards to the south and also in Henderson-Massey to the west (Figure 13).
Analysis at a More Detailed Level

The analysis has also examined broad trends across the Region at a Census Area Unit level and also the commuting associated with a selection of representative residential and employment areas.

Region wide trends

Commuting distances from workers' homes display a fairly regular pattern, with journey lengths typically increasing away from the central area, although they are generally longer on the North Shore than south of the Waitemata Harbour (Figure 14).

Figure 14: Trip length by residential area 2013

Commuting patterns by workplace show above average commuting distances to most of the larger employment areas, presumably reflecting wider catchments and the need to attract specialist skills. The Airport is a prime example of this (Figure 15).
Closer examination of selected employment areas shows that these areas tend to draw their employees from catchments further away from the centre of the city and the degree of outbound commuting is limited.

Travel to employment outside of the larger employment areas shows below average trip distances, particularly in the east from Howick to Botany and also in mainly residential areas elsewhere. This is assumed to reflect the high proportion of retail and small scale service activities which can be filled by local workers and for which wage rates are insufficient to support longer distance commuting.
Local Employment Areas

The selected employment areas, with the exception of Newmarket, typically have a high share of private vehicle trips, reflecting the pattern of wide catchments, dispersed employment and limited public transport services. However, bus and rail use is generally higher for those areas served by major public transport corridors. The exceptions to this are Onehunga/Penrose which has a rail connection, but more limited bus services and dispersed employment, and Manukau Central to which rail services started in 2012, but for which the uptake by 2013 had been very limited (Figure 16).

Between 2006 and 2013, Takapuna/Westlake, Newmarket and Ellerslie South (all located on major public transport corridors), saw notable reductions in the shares of private vehicle trips. In other areas the reductions were smaller, reflecting limited public transport use outside of commercial centres, while the private vehicle share of commuting actually increased to Highbrook/East Tamaki and the Airport.

Figure 16: Selected employment areas: Modal splits 2013

Selected Residential Areas

Trip patterns for a number of residential locations across the Region, either in existing centres or new development areas, have also been examined.

Commuting for these residential areas shows, not surprisingly, a pattern of higher public transport and active mode shares for areas close to commercial centres, such as Newmarket and Takapuna. These shares typically decline as distance from the city centre increases. Newer residential areas on the outskirts, such as Westgate and Dannemora/Flatbush have relatively high private mode shares at 83-86 per cent compared to the regional average of 75 per cent (Figure 17).

Figure 17: Mode splits for commuting trips from selected residential areas 2013

Stonefields, however, is something of an anomaly. Despite reasonable density and a high proportion of travel to the CBD, this new Inner Urban development has a private vehicle share that is higher than surrounding suburbs and is more characteristic of new developments on the periphery of the urban area.
Changes in the RTN Corridors: The Northern Busway and the Rail Corridor

The rail and bus networks have received considerable investment with a number of new or improved facilities coming on stream in recent years.

The Northern Busway has provided a major improvement in bus services from the North Shore. Following its completion, bus commuting has increased very substantially, particularly in the areas adjacent to the Busway stations where bus use has grown to almost twice the regional average. Bus use (and public transport use in general) elsewhere in the North Shore is also higher than the regional average, both in the northern locations potentially served by Busway feeder routes and areas further south where the direct impact of the Busway is limited. This latter area has a high proportion commuting to the CBD, for which bus use is an attractive option, and may also have benefitted from the improvements in services for the North Shore in general associated with the Busway.

The Busway appears to have had a significant impact on travel to the CBD, leading to an absolute decline in the number of private vehicle trips from the North Shore, with a corresponding shift to bus even though overall commuting to the CBD increased (Figure 18).

Figure 18: Changes in commuting into the CBD from the North Shore by mode 2006-2013

Rail services have also improved, with extensions to the network and increases in service frequency and capacity. Between 2006 and 2013, the number of rail trips from the residents in the rail corridor to all destinations increased by 74 per cent. Within the corridor, this has given an increase in the modal share of about 1.5 per cent. This is broadly balanced by a reduction in the private vehicle share, with the shares of bus and active modes staying broadly unchanged (Figure 19). In absolute terms, however, private vehicle trips from the rail corridor as whole continued to grow, outnumbering new rail trips by more than two to one and even increased to the CBD, a major destination for rail travel.

Figure 19: Changes in modal shares in the rail corridor 2006-2013

Only about 60 per cent of rail trips come from those living in areas adjacent to the rail line. The remainder are from areas further away, emphasising the importance of facilities providing longer distance access to the rail network, such as feeder bus services and park and ride and kiss and ride facilities.
Cross-Harbour Flows

Commuting across the Waitemata Harbour 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 to represent a third of the total commuting flow.

Public transport currently accounts for about 15 per cent of cross harbour commuting 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 private transport commuting has grown over this period in absolute terms, its share has fallen from 81 per cent to 76 per cent.

Overall commuting movements southbound across the harbour are dominated by movements from the North Shore to the CBD and to the remainder of the Isthmus, which account for 36 per cent and 41 per cent of the total respectively. Of these, public transport accounts for a high share of around 35 per cent of travel to the CBD and a lower share of 8 per cent of travel to the Isthmus. For these main movements, higher growth has been experienced between the North Shore and the Isthmus with an increase of 14 per cent between 2006 and 2013 compared with 8 per cent to the CBD. Much higher growth rates although from much smaller bases have been experienced for the longer distance trips from the Outer North to areas south of the harbour with increases of between 28 per cent and 62 per cent.

For all movements, public transport has grown faster than commuting in general and its modal share has therefore increased, although again, in some instances, this has been from a very low base.

Overall Assessment

Commuting in Auckland is dominated by private transport, which accounts for almost 75 per cent of journey to work movements. However, between 2006 and 2013, the number and share of commuters travelling by public transport increased significantly. These were led by increases in travel into the CBD associated with recent public transport investments and for cross-harbour movements to the CBD increases in bus use were associated with a decrease in the numbers commuting by car. Despite this, at a regional level, the share of driver trips has remained unchanged. Private vehicle passengers, rather than drivers, have reduced in number and gains in public transport travel to the CBD have been offset by increases in private transport travel in outer areas where public transport shares are low.

A picture therefore emerges of contrasts in travel patterns between two of Auckland’s key geographic areas: the central area, where mode change is occurring, and the remainder of the Region, particularly the outer areas, where the number of commuting trips has been growing strongly but where the shares of the different modes have remained largely unchanged.