

CANTERBURY REGIONAL PROFILE AND FUTURE TRANSPORT ISSUES



FEBRUARY 2010

Working Paper RLTS/01

This report has been prepared by the Canterbury Regional Land Transport Officers Group on behalf of the Canterbury Regional Transport Committee. For any enquiries, contact Environment Canterbury, phone 03 353 9007, or email transport@ecan.govt.nz

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1. Introduction

This report has been prepared by the Canterbury Regional Transport Officers Group (TOG) to act as background material for the “Issues and Challenges” work stream of the Canterbury Regional Land Transport Strategy (RLTS) 2011-41 development process.

The purpose of the report is two-fold:

- To provide background context around the economy and people of Canterbury – essentially, what does Canterbury look like now, how has it been developing and where might it go over the next 30 years?
- To provide background data and context for the emerging transport issues that are being developed as a component part of the RLTS 2011-41 development process.

The RLTS 2011-41 development process is fortunate that it has the recently published Canterbury Regional Economic Development Strategy (CREDS) 2009 upon which to draw for a significant amount of background data. Other background data has been sourced from Environment Canterbury’s regional land transport monitoring programme. Where appropriate quantifiable data is unavailable or of limited value / quality, more qualitative commentary of trends and issues has been incorporated.

The report is structured into the following chapters:

- Chapter 2 presents a picture of the people who live and work in Canterbury, in terms of where they live, how they live and how patterns observed today are projected to evolve into the future.
- Chapter 3 discusses the economy of Canterbury, how it has developed in recent years and how it is likely to evolve and change in the future.
- Chapter 4 focuses on the transport patterns that the people and economy of the region currently generate, how it has evolved to date and how it might evolve into the future.
- Chapter 5 then turns to focus on emerging future transport issues and attempts to provide some context and background material on each one.

2. The People of Canterbury

2.1 Population Growth

Table 2.1 presents data on district level population data from the 2001 and 2006 censuses, together with the most recent city/district level population projections for Canterbury to 2031.

City / District	2001	2006	2011	2021	2031	% growth 2006 to 2031
Kaikoura	3,580	3,730	3,830	3,950	3,940	+5.6%
Hurunui	10,150	10,750	11,250	12,050	12,650	+17.7%
Waimakariri	37,900	44,100	48,400	56,400	64,100	+45.4%
Christchurch	335,300	361,800	377,400	402,300	422,100	+16.7%
Selwyn	28,300	35,000	39,200	46,400	53,400	+52.6%
Ashburton	26,000	28,000	29,000	30,300	30,900	+10.4%
Timaru	42,800	43,800	44,000	43,600	42,300	-3.4%
Mackenzie	3,790	3,900	3,960	3,960	3,840	-1.5%
Waimate	7,220	7,380	7,260	6,890	6,380	-13.6%
North Waitaki*	1,660	1,540	1,700	1,550	1,390	-9.7%
Canterbury Region	496,700	540,000	566,000	607,400	641,000	+18.7%

Table 2.1: Estimated resident population and medium growth population projection tables

Source: Statistics New Zealand

*The North Waitaki data is calculated as a residual to ensure that the sum of the numbers for the districts of Canterbury equals the numbers for the region.

The Greater Christchurch area is forecast to see the bulk of the growth in regional population, with particularly high growth forecast for the Waimakariri and Selwyn districts – this builds on the relatively strong population growth already seen in these areas between 2001 and 2006. More modest growth is forecast for Hurunui, Ashburton and Kaikoura districts, with four southern districts projected to lose population over the period to 2031.

Whilst published statistics from Statistics New Zealand focus on an end point of 2031, more detailed forecast data (to 2041 and 2061) has been commissioned as part of the Greater Christchurch Urban Development Strategy process. As its basis for planning, the UDS has adopted a “medium-high” growth scenario for the Greater Christchurch area – these forecasts see an additional 112,400 residents within Christchurch, Waimakariri and Selwyn between 2006 and 2041.

2.2 Age Profile of Population

Table 2.2 presents Statistics NZ population projections shares for the Canterbury region, broken down by age.

	2006	2011	2016	2021	2026	2031	% change 2006 to 2031
0-14 Years	19%	19%	18%	18%	17%	16%	-3%
15-39 Years	34%	32%	31%	31%	31%	30%	-4%
40-64 Years	33%	34%	33%	32%	31%	30%	-3%
65 Years and over	14%	15%	17%	19%	22%	24%	+10%

Table 2.2: Sub-national Population Share Projections by Age, 2006(base)-2031

Source: Statistics New Zealand

The aging of the region’s population can be clearly seen from these projections. The traditional working age population (i.e. those between 15 and 64) is notable in that it is forecast to shrink from 67% of the total regional population in 2006 to 60% by 2031.

What this projected demographic change does not, however, show is what this might mean for travel patterns in the region. It is entirely possible, for example, that many Cantabrians will continue to work beyond 65 years of age.

What is, however, clear from these projections is that the travelling public of the region will be quite different 20 years from now, with potentially quite different transportation needs.

2.3 Number of Households

Table 2.3 shows household projections for the Canterbury region to 2031 – from a 2006 base.

	2006	2011	2016	2021	2026	2031	Change 2006-31	
							Number	Average Annual %
Canterbury region	211,700	225,200	238,400	251,000	263,400	275,100	+63,400	+1.1%

Table 2.3: Subnational Household Projections, 2006(base)-2031

Source: Statistics New Zealand

Canterbury, in common with all regions, is forecast to see an increasing number of households over the period to 2031.

Table 2.4 takes the regional population projections from Table 2.1 and the household projections from Table 2.3 to look at how projected household size will evolve over the period to 2031.

	2006	2011	2016	2021	2026	2031
Canterbury region	2.55	2.51	2.47	2.42	2.37	2.33

Table 2.4: Household Size Projections, 2006(base)-2031

Source: Derived from Statistics New Zealand population and household projection data

This data suggests that household numbers are projected to grow at a faster rate than population, thus resulting in less people per dwelling in the future. Given the population age profile projections outlined in Table 2.2, the conclusion must be that there will be less families with children living in the region and more older households – with either one person resident or a couple resident.

3. The Economy of Canterbury

Historically, the economy of the Canterbury region was largely based upon agriculture. Whilst the agricultural sector is still important, the present day Canterbury economy is a lot more balanced in terms of what it produces.

CREDS uses a number of available data sources to paint a picture of the economy of the region. Whilst there is no single source of data that tells the whole story, estimates of how different sectors contribute to regional GDP and how many jobs those sectors provide are both instructive in understanding what the economy of the region is all about.

Table 3.1 below is taken from CREDS 2009 and is based upon estimates prepared by Infometrics Ltd of the percentage contribution of each sector to regional GDP. The corresponding figure for New Zealand is also presented for comparison.

	Canterbury		N.Z.
	\$million	%	%
Agriculture, Forestry and Fishing	1,073.3	6.9	6.1
Mining	35.1	0.2	1.0
Manufacturing	2,333.6	15.0	14.0
Electricity, Gas and Water Supply	189.1	1.2	1.7
Construction	709.6	4.6	4.7
Wholesale Trade	1,003.8	6.4	7.7
Retail Trade	1,165.4	7.5	6.2
Accommodation, Cafes and Restaurants	311.5	2.0	1.5
Transport and Storage	826.7	5.3	4.7
Communication Services	854.6	5.5	5.9
Finance and Insurance	814.3	5.2	6.8
Property and Business Services	2,072.9	13.3	13.7
Government Administration and Defence	606.7	3.9	4.4
Education	540.9	3.5	3.3
Health and Community Services	991.6	6.4	5.2
Cultural and Recreational Services	223.0	1.4	1.9
Personal and Other Services	218.6	1.4	1.4
Ownership of Owner-Occupied Dwellings	1,048.0	6.7	5.9
Unallocated	549.8	3.5	3.5
TOTALS	15,568.3	100	100

Source: Infometrics Ltd.

Note: Columns may not sum to totals due to rounding errors.

Table 3.1: Canterbury Regional GDP by Sector 2007
Source: Reproduced from CREDS 2009

Figure 3.1 is also taken from CREDS 2009 and highlights 2006 census employment data by sector of the economy.

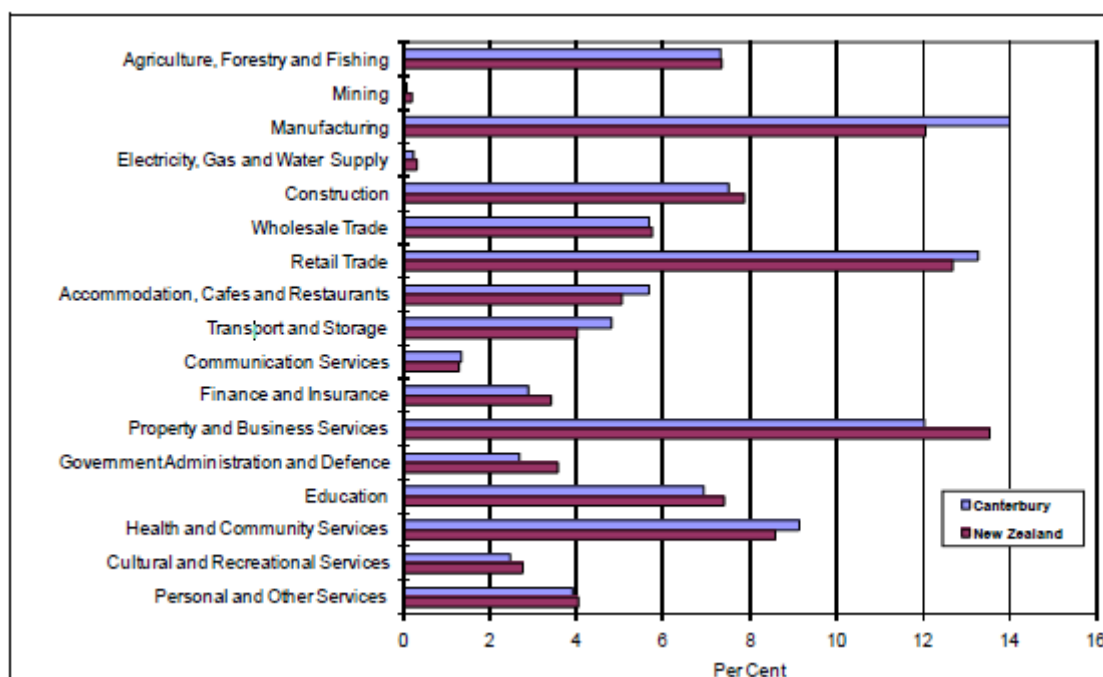


Figure 3.1: 2006 Census employment data by sector – Canterbury and New Zealand
 Source: Reproduced from CREDS 2009

Whilst these data sets based upon census data are fairly crude, they do highlight certain facts about the Canterbury economy.

Key sectors, by value, are manufacturing, property & business services (i.e. businesses that typically supply services to other businesses), agriculture / forestry / fishing and retailing. In terms of numbers employed, the picture is similar, although health and community services provide more jobs in the region than does the agricultural / forestry / fishing sector.

What cannot be gleaned from these types of statistics is how much of some sectors are involved in supplying other sectors, as opposed to undertaking activity that generates inbound revenue to the region. For example, the data above probably downplays the importance of the agricultural / forestry / fishing sector, as many property and business services will be reliant upon the former sector for a large proportion of their business.

Despite these uncertainties, it is evident that the current Canterbury economy is one that is no longer dominated by one sector, as was the case with agriculture in the past.

Going forward, however, agriculture is likely to remain a significant driver of the regional economy, with increasing volumes of dairy related activity more than offsetting declines in sheep and beef farming levels. Horticulture and viticulture are also both likely to remain important, with significant emphasis being placed on the ‘value-added’ ends of all these activities.

CREDS 2009 discusses work published by Industry New Zealand in 2002 that attempted to identify important industry clusters around New Zealand. In Canterbury, six clusters were identified – in the areas of electronics, software, furniture, education, ‘neutraceuticals’ (essentially food science related industries) and Lincoln resources (i.e. business allied to Lincoln University that largely operate in leading edge agricultural technology and development).

Manufacturing, particularly of niche and high value products, is also likely to be a significant driver of growth for the regional economy going forward.

4. Transport Patterns and Trends

Traffic and transport within the Canterbury region has three quite distinct components:

- Urban transport to / from and within Greater Christchurch
- Urban transport in and around the smaller towns of the region
- Rural traffic around the wider Canterbury region

4.1 Greater Christchurch

Figures 4.1 and 4.2 show a time series of traffic volumes at selected sites around the city and also on the northern and southern approaches.

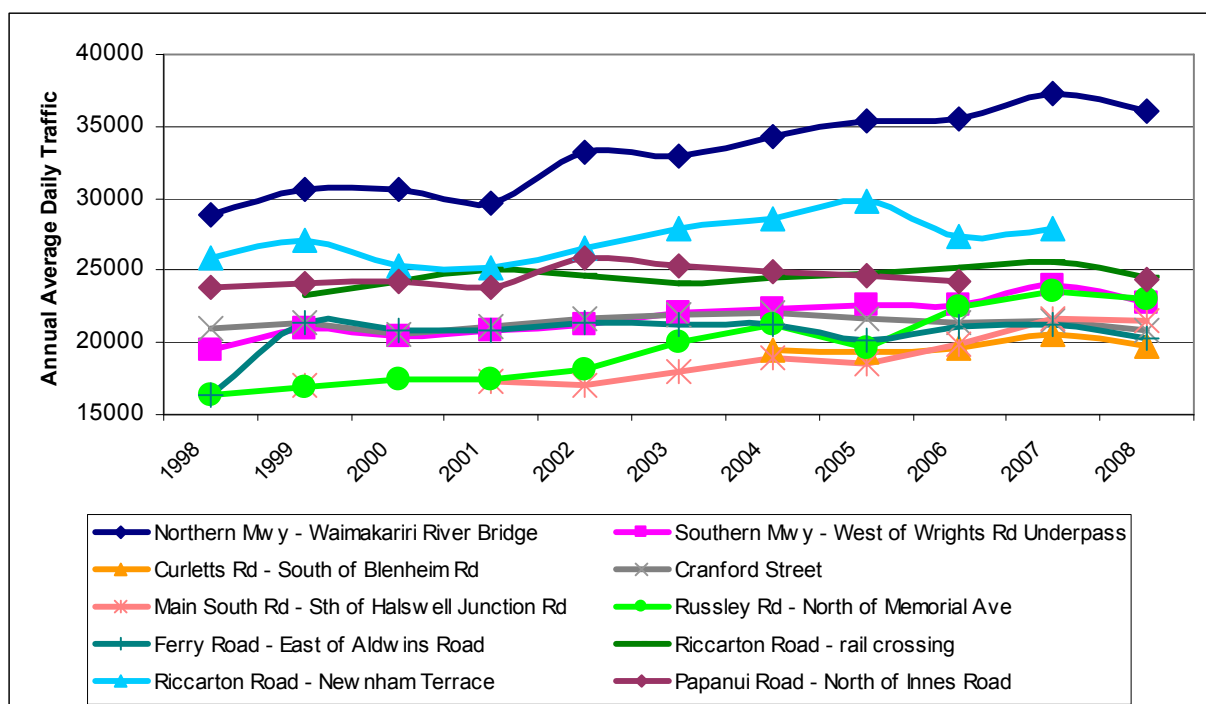


Figure 4.1: Annual average daily traffic (AADT) counts at selected locations within Christchurch City

Source: Christchurch City Council

Note: no data available for Riccarton Road – Newnham Terrace in 2008

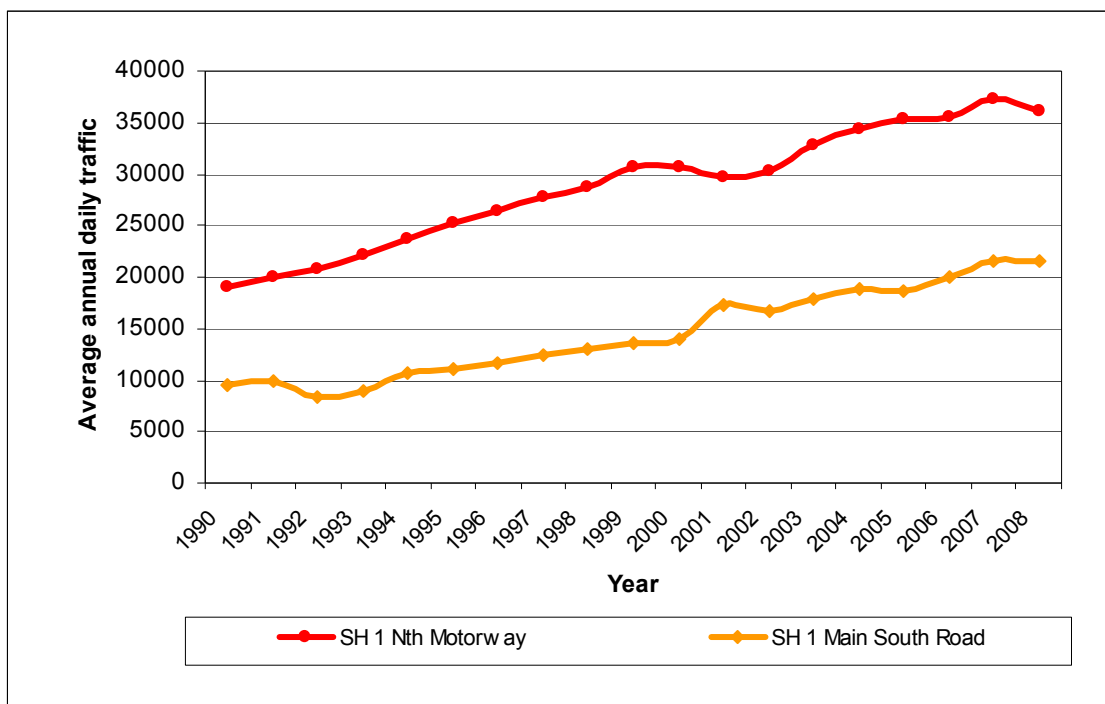


Figure 4.2: Annual average daily traffic (AADT) counts on SH1 to north and south of Christchurch
Source: NZTA

Two distinct trends are evident in these time series charts.

Firstly, traffic has grown modestly within Christchurch City, as the population and economy of the city has expanded over time. The only exception to this pattern has been in 2008, when high fuel prices, followed by recession impacted negatively on traffic growth.

The same cannot, however, be said of traffic volumes on the northern and southern fringes of the city, where much stronger traffic growth has been witnessed. Looking at this data in conjunction with the population growth figures for Waimakariri and Selwyn Districts, it can be concluded that a large part of the population growth in these outlying areas is accessing employment opportunities within Christchurch City.

4.2 Other Urban Centres in Canterbury

There are three towns (Rangiora, Kaiapoi and Ashburton) in Canterbury with a population of over 10,000 and also the city of Timaru – with a population of around 27,000 at the last census in 2006.

Figure 4.3 and 4.4 show available traffic count data on key roads in Kaiapoi and Rangiora.

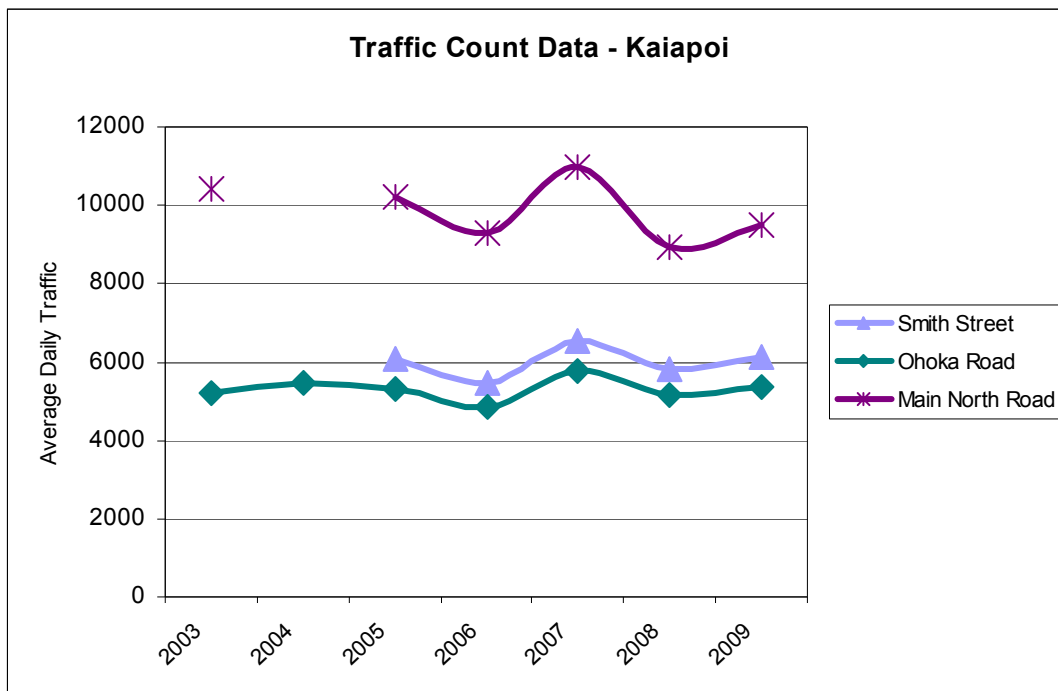


Figure 4.3: Average daily traffic (ADT) counts on selected local roads in Kaiapoi
Source: Waimakariri District Council

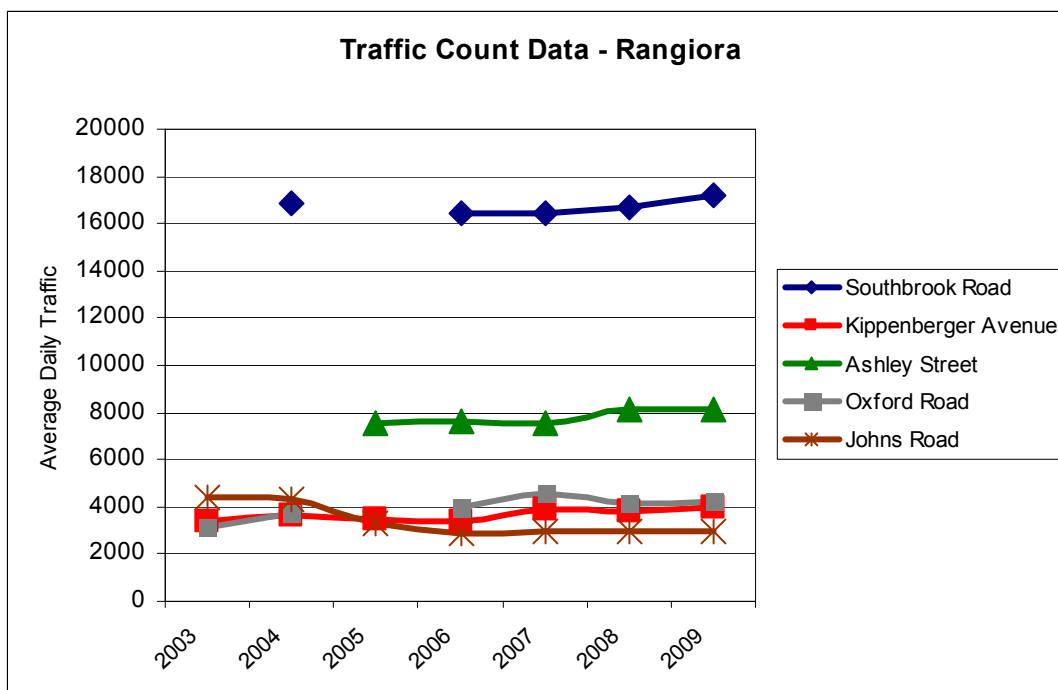


Figure 4.4: Average daily traffic (ADT) counts on selected local roads in Rangiora
Source: Waimakariri District Council

Unlike the data for Christchurch City, ADT data for these two urban areas shows little in the way of growth over time, although variability in the count data on some roads makes understanding a time trend difficult.

ADT data, by its very nature tends to mask any peaking effects. Figure 4.2, despite being a daily average, clearly shows the impact of increasing levels of commuting and other trip making into Christchurch City. Whilst the ADT data does not show the impact, both Kaiapoi and Rangiora experience some limited congestion in both the morning and afternoon peak times, as the Christchurch commuters leave / return respectively. Little data exists to quantify the size of these peaks and whether they are growing over time, but anecdotal evidence

would suggest that there is a short lived period of localised congestion each day out of and into these towns.

Figures 4.5 and 4.6 show time series traffic count data on State Highway 1 as it passes through Ashburton and Timaru respectively.

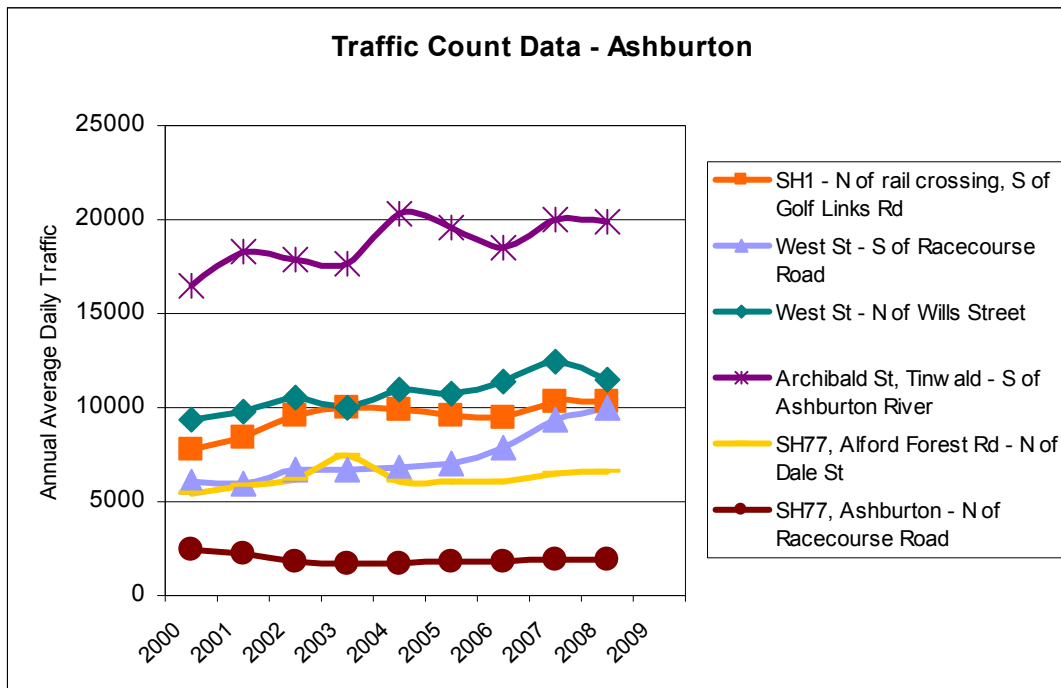


Figure 4.5: Annual average daily traffic (AADT) counts on SH1 in Ashburton
Source: NZTA

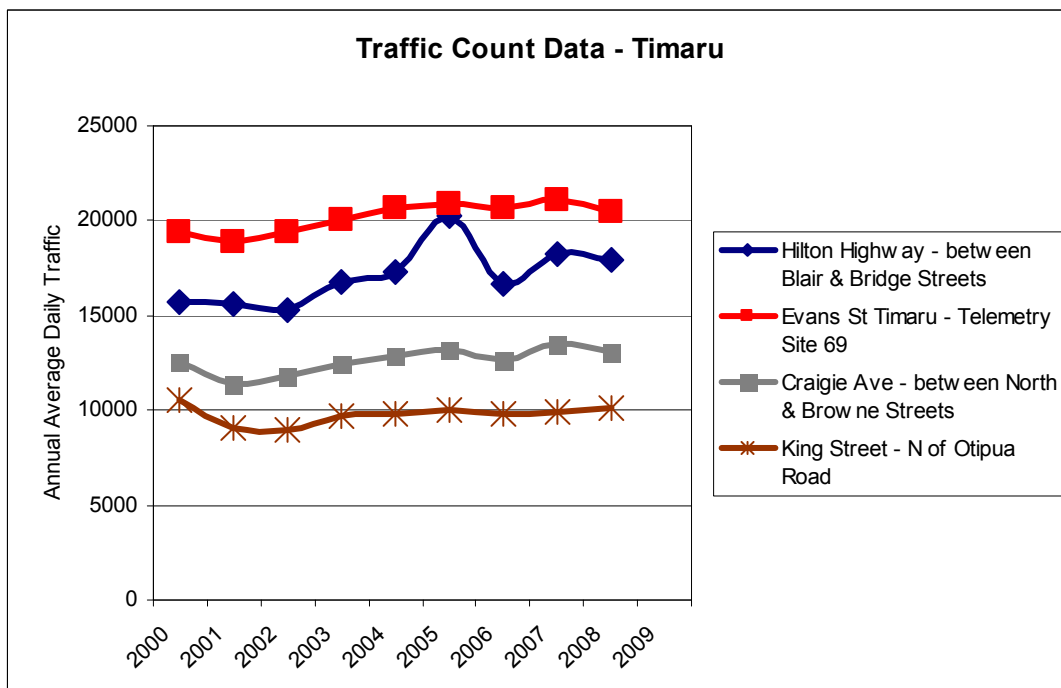


Figure 4.6: Annual average daily traffic (AADT) counts on SH1
Source: NZTA

Whilst the AADT does not allow one to distinguish between local and through traffic and also mask peak period effects, there is a clear upward trend in traffic in Ashburton over the period from 2000 to 2008. In Timaru, the growth observed on SH1 is less pronounced.

4.3 Rural Canterbury

Outside of main urban areas, the Canterbury State Highway network carries a large proportion of total traffic volumes.

Figure 4.7 shows time series data for a selected number of rural State Highway locations around the region.

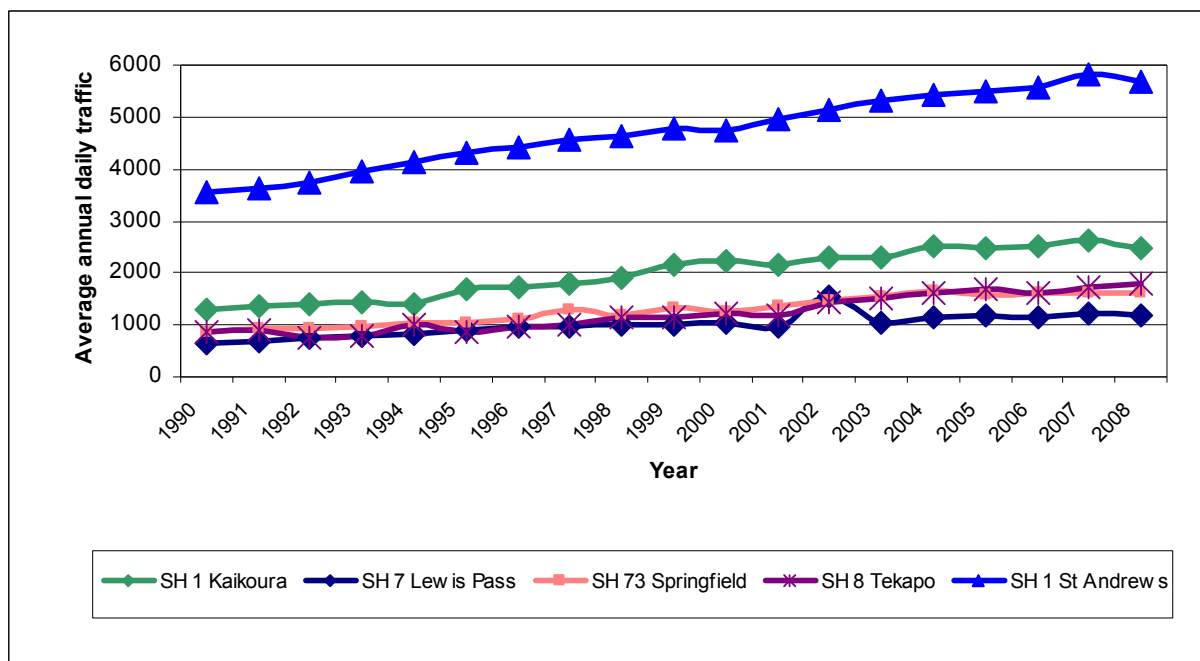


Figure 4.7: Annual average daily traffic (AADT) counts at selected rural State Highway locations
Source: NZTA

Generally speaking, traffic growth in rural areas is driven by economic and population growth. Figure 4.7 shows modest year-on-year traffic at most locations. The impact of the 2008 recession is clearly evident, but the long-term gentle upward trend is likely to re-emerge as economic growth returns.

4.4 Mode Choice

‘Choice’ of transport mode is largely an issue for those living within the Greater Christchurch urban area and potentially the smaller urban centres in the region. In the more rural parts of Canterbury, the choice is less about ‘mode’, as a private motor vehicle is typically the only option for most trips, but more about how that mode is used – for example, are several trips chained together or is a vehicle shared between more than one occupant to reduce the costs to each one.

Modal choice data is typically obtained from two sources – the New Zealand census and the Ministry of Transport Household Travel Survey (HTS). The census provides region wide journey to work data at 5 yearly intervals, whereas the HTS provides annual data on a wider range of trips, but only for the Greater Christchurch sub-region – outside this area, the HTS sample size is insufficient to allow detailed analysis.

Figure 4.8 shows census journey to work data for the Canterbury region from 1991 to 2006 for non-car modes of travel.

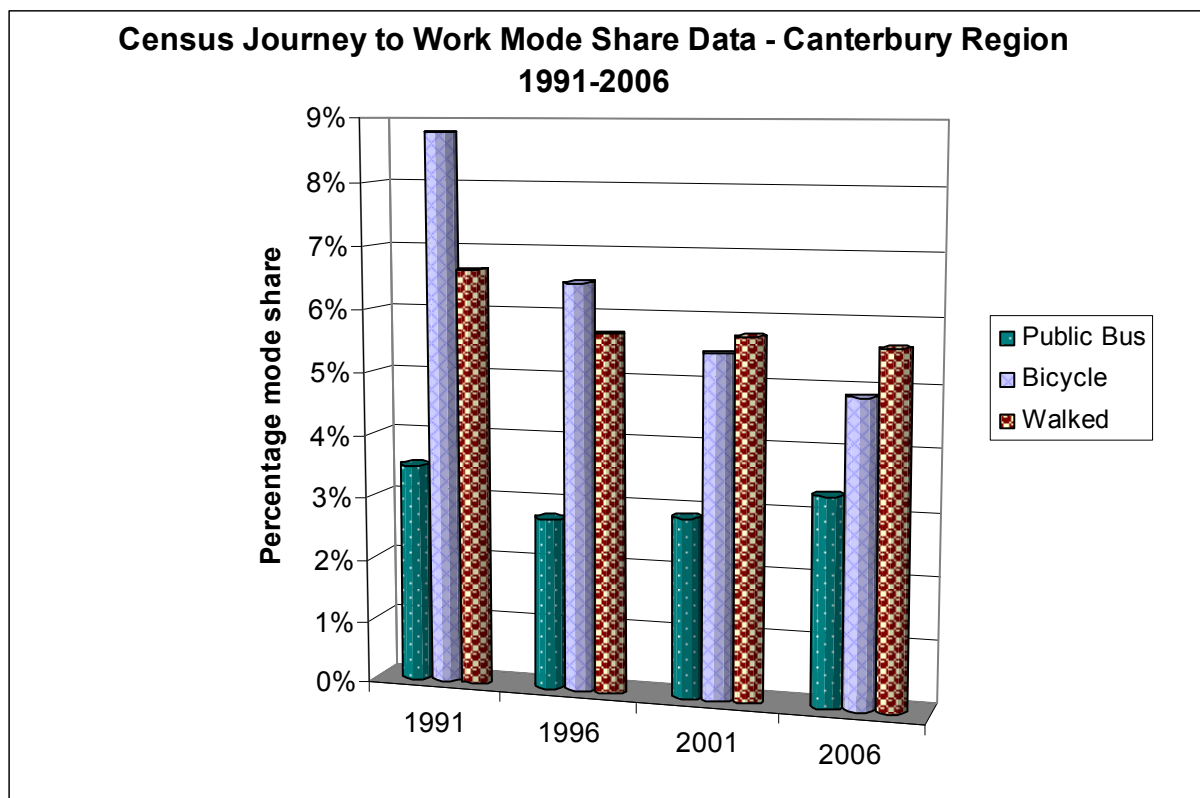


Figure 4.8: Census journey to work data for Canterbury region
Source: Statistics New Zealand

Several trends are evident from this data:

- Total reported journey to work trips have risen from just short of 150,000 to 200,000 over the period, with the proportion of 'car driver' reported rising from 70% in 1991 to 79% in 2006.
- After declining through the 1990's, the significant investments made in public transport within Greater Christchurch (and more recently Timaru) have reversed this downward trend in use of public buses for the journey to work.
- Whilst walking to work has declined modestly, there has been a steep decline in cycling as a mode choice for the journey to work.

Canterbury wide mode share data is only useful to a point – as noted above, for many trips outside of urban areas of the region, taking a mode other than the car is often impossible. Furthermore, walking and cycling are only appropriate for a subset of all trips that people make and many trips involve more than one 'mode' of transport – e.g. a bus trip that has a walk component at each end. The HTS attempts to understand these issues in more detail, by focusing on trip legs – so the bus trip described in the preceding sentence would count three trip legs, rather than just one bus trip that the census approach would record.

Figure 4.9 presents HTS mode share data for all trips legs made within Christchurch City during 2008/9.

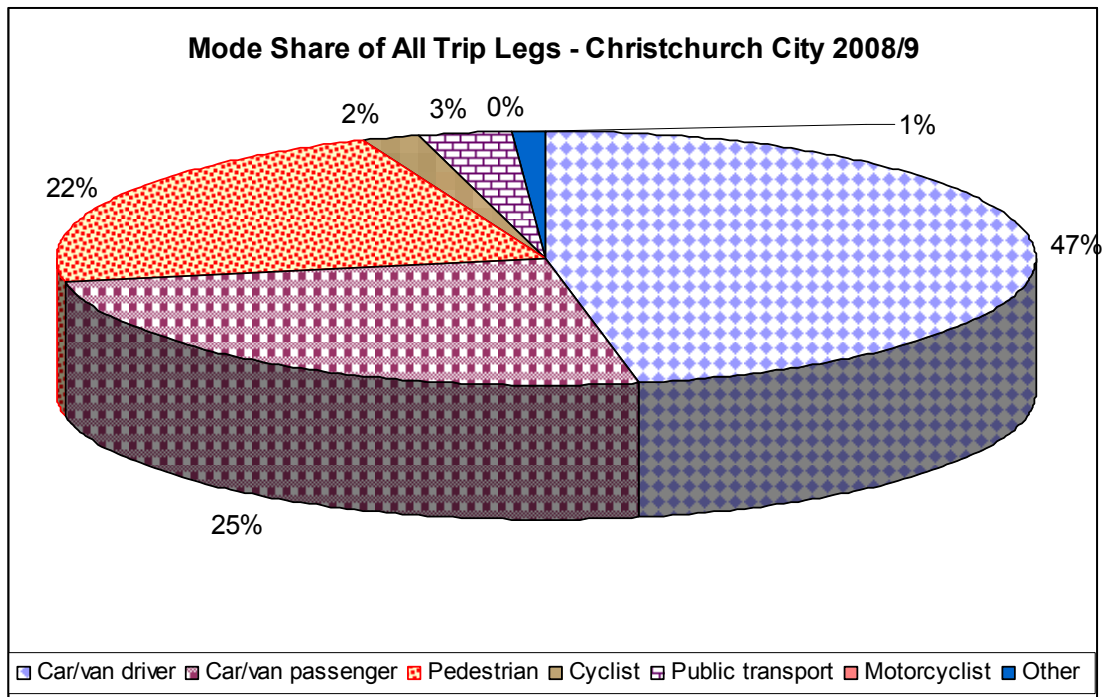


Figure 4.9: Mode shares of all trip legs – Christchurch 2008/9
 Source: Ministry of Transport

Looking at mode share in this way highlights the greater number of walking trips that are made as part of other journeys.

2008/9 is the first year in which an expanded (i.e. to a level that allows annual data for Christchurch City to be analysed) sample has been available for analysis. Previously, MoT has used three year rolling data sets to understand trends in the data from the HTS at a sub-regional level.

Table 4.1 presents the same data as is highlighted in Figure 4.9, but uses the MoT three year rolling data sets to show any trends that are evident over the period from July 2003.

Shares of trip legs – Christchurch City	Jul 03 - Jun 07	Jul 04 - Jun 08	Jul05 - Jun09
1a.Car/ van driver (single occupancy)	30.5%	28.8%	28.8%
1b.Car/ van driver (multiple occupancy)	17.3%	17.0%	16.4%
2.Car/van passenger	24.8%	24.0%	23.9%
3.Pedestrian	20.8%	22.6%	22.8%
4.Cyclist	2.3%	2.8%	2.8%
5.PT (bus/train/ferry)	2.8%	3.3%	3.7%
6.Motorcyclist	0.2%	0.1%	0.1%
7.Other household travel	1.1%	1.1%	1.0%
Total	100%	100%	100%

Table 4.1: Mode shares in Christchurch City – rolling 3 year data sets from July 2003
 Source: Ministry of Transport

Changes in mode choice are, unsurprisingly, fairly limited, given that there has been very little policy directed at serious attempts to influence how people travel over the period in question.

Following a period of relatively significant investment in bus services within the Greater Christchurch metropolitan area, it is encouraging to see that public transport mode share has increased – by almost 1% - over the period. A corresponding increase in walking trip legs is also evident – these are most likely to be associated with the increased public transport mode share, as one public transport trip typically has two walking trip legs associated with it. These

increases have been at the expense of private vehicle mode share – with both car drivers and car passengers shifting to public transport over the period.

Whilst the HTS data suggests that the investments made in public transport within Greater Christchurch are encouraging a degree of mode shift, this needs to be set against the data presented in Figures 4.1 and 4.2 above. Although public transport has increased its market penetration, this is against a backdrop of a growing travel market over the period from 2003 to 2008. Despite a drop in private vehicle mode share, the continued growth in trip making over the period has ensured that overall traffic volumes have continued to rise throughout much of the six year period.

5. Transport Issues for Canterbury

5.1 The Vehicle Fleet

5.1.1 Size of fleet

Between 2000 and 2008, the vehicle fleet in Canterbury grew from around 380,000 to nearly 480,000.

Most of this growth – 73,000 vehicles were light passenger vehicles (i.e. cars), with around 10,000 additional light commercial vehicles and 6,000 heavy goods vehicles also entering the fleet.

An additional 5,500 motorcycles also entered the fleet, with growth in this area concentrated in the latter half of the period – numbers of motorcycles actually declined between 2000 and the end of 2003.

The growth in car ownership that has been witnessed in Canterbury is greater than can be attributed to population growth alone. The number of cars owned per 1000 Cantabrians has increased from 637 in 2000 to 701 eight years later.

A frequently cited statistic is that Canterbury has some of the highest vehicle ownerships in the world. Figure 5.2 presents an international comparison of car light vehicle ownership – for 2003, a year when presumably the relevant international data was last available.

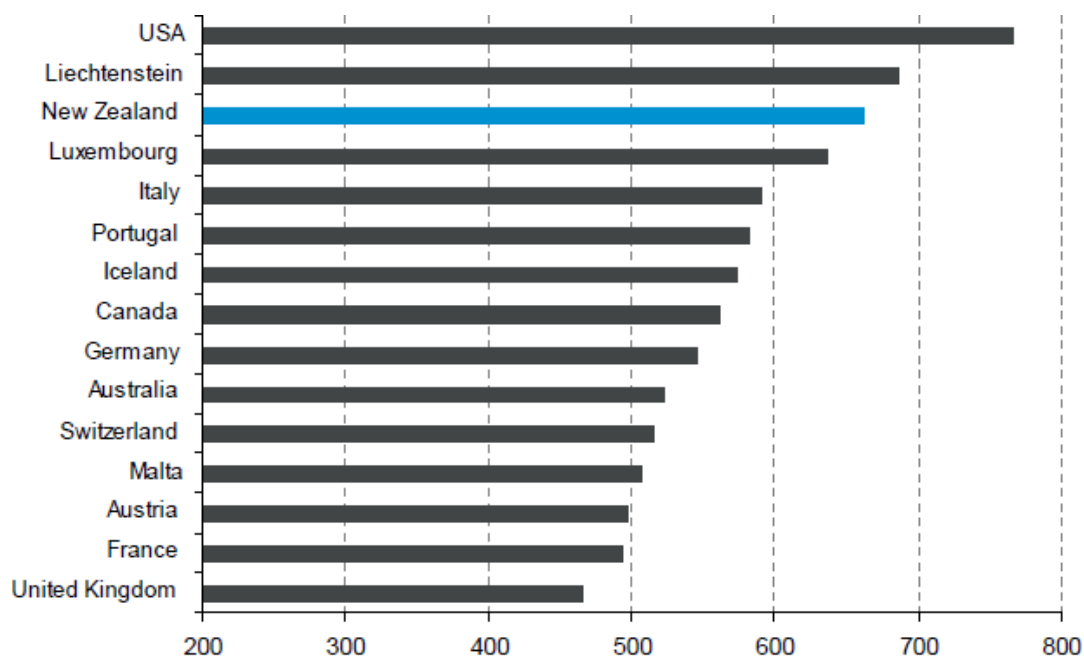


Figure 5.1: International light vehicle ownership rates, 2003
Source: Ministry of Transport

The figure for Canterbury in 2003 was 675 – above the New Zealand average and clearly in third place after the USA and Liechtenstein.

5.1.2 Composition of fleet

Regional level fleet data that allows analysis at a more detailed level than that presented in section 5.1.1 is not readily available, so the analysis that follows is national data published by MoT. It is likely that Canterbury is broadly typical of the national picture in respect of the trends commented on.

Figure 5.2 presents national level data for 2007 on fleet composition.

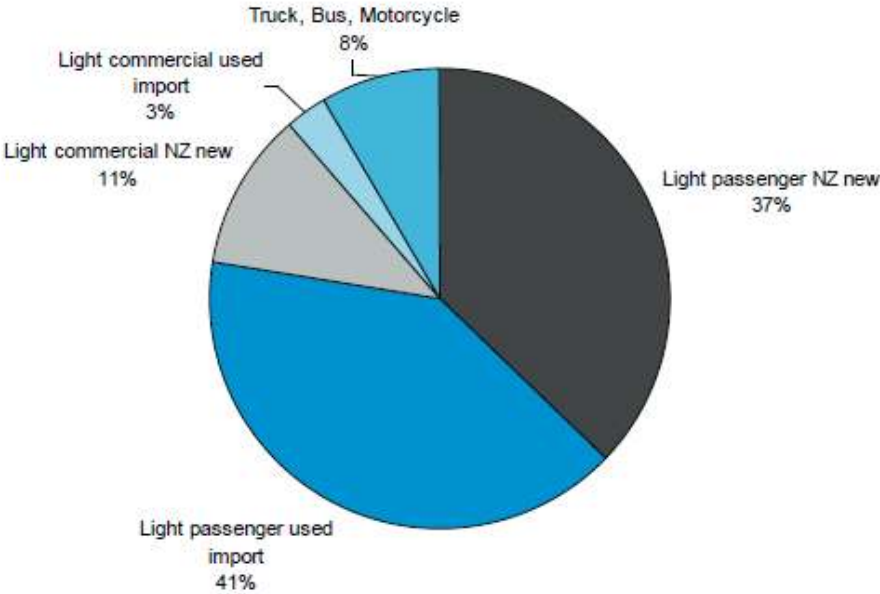


Figure 5.2: National fleet, by vehicle type, 2007
Source: Ministry of Transport

Figure 5.3 presents MoT fleet data for December 2007 in terms of the numbers of vehicles (NZ new and imported second hand) that comprise the light vehicle fleet in New Zealand.

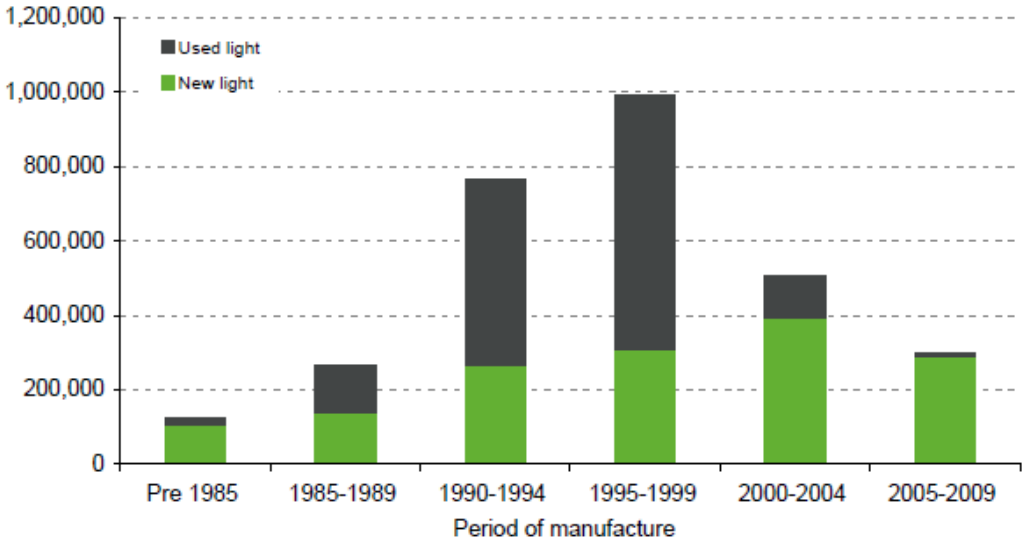


Figure 5.3: Light vehicle fleet composition, December 2007
Source: Ministry of Transport

The age profile for the New Zealand light vehicle fleet is markedly older than many other countries and the impact of used imports can be clearly seen as the driver of this pattern – used vehicles are typically between 7 and 9 years old when they enter the New Zealand fleet.

Figure 5.4 shows how the average engine size of the petrol and diesel fleet has evolved since 2000.

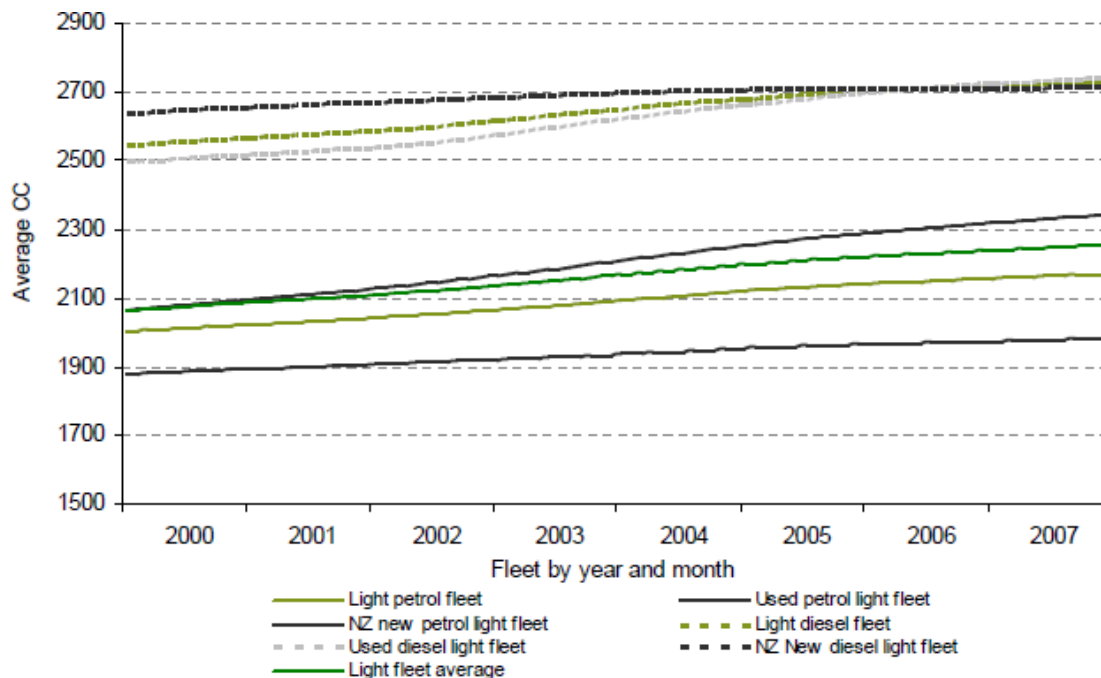


Figure 5.4: Light vehicle fleet average engine size 2000 to 2007
Source: Ministry of Transport

The average diesel engine has grown in size from around 2500cc to 2700cc, with the growth in size tailing off in around 2005.

Petrol engines have also risen in size of the period, but the tailing off in average size noted for diesel engines is not evident, with an upward trend visible throughout the period.

5.2 Road Safety

The road safety record of the Canterbury region over the past 10 years has been rather mixed. Figures 5.5 and 5.6 present data on road deaths per 100,000 residents and road deaths + hospitalisations per 100,000 residents over the period from 1998 (for deaths) and 2001 (for deaths plus hospitalisations – the year in which collection of this data series commenced).

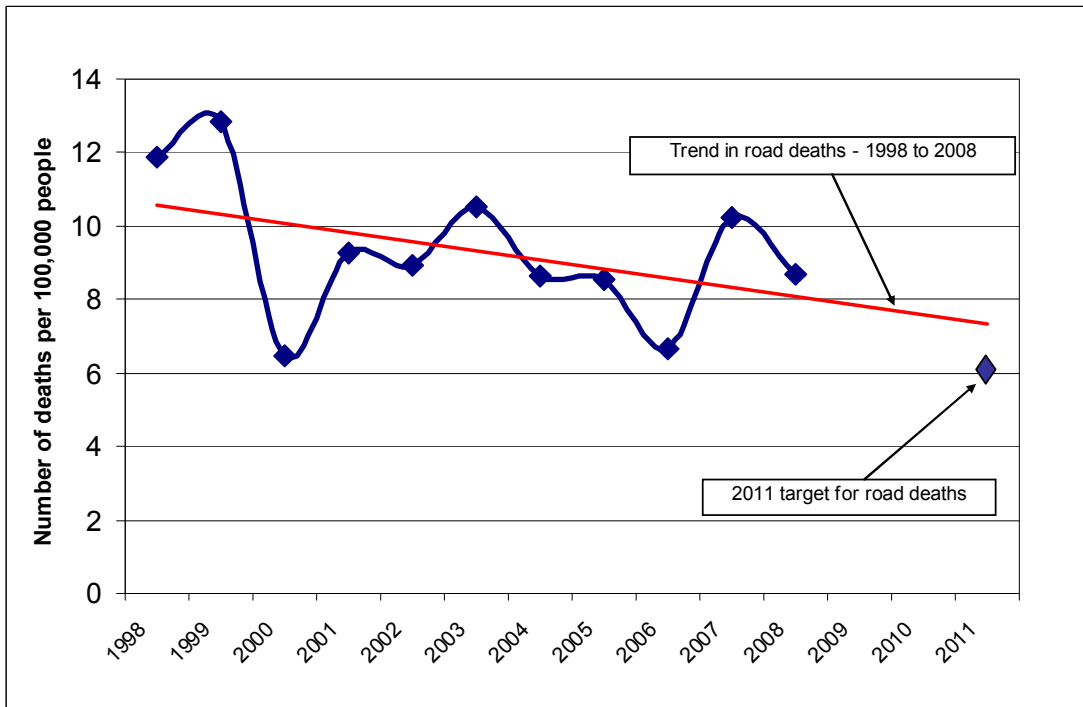


Figure 5.5: Road deaths in the Canterbury region – 1998 to 2008.
Source: NZTA & Canterbury RLTS 2008-18

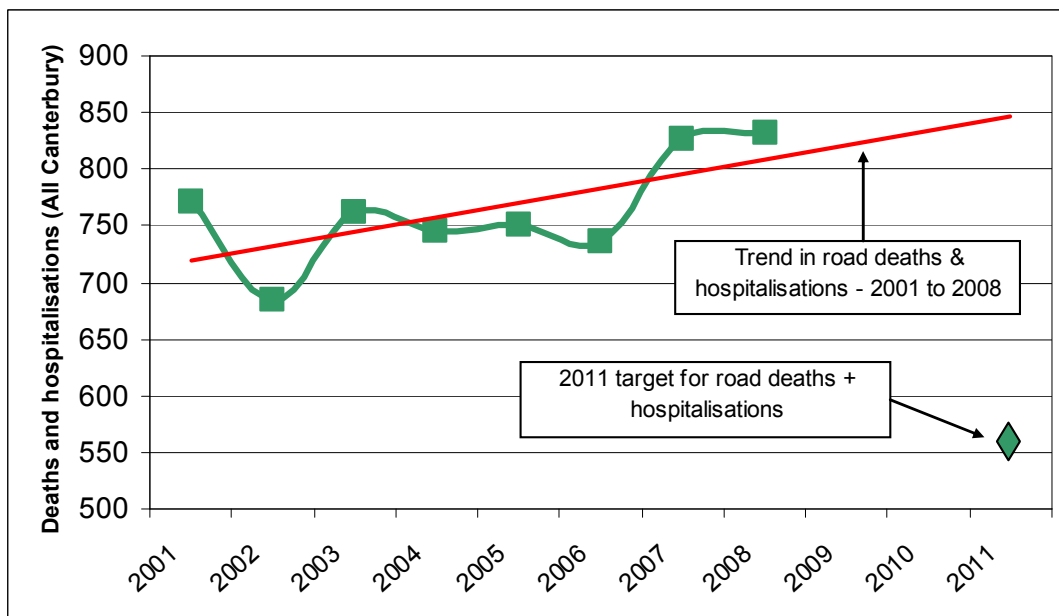


Figure 5.6: Road deaths plus hospitalisations in the Canterbury region – 1998 to 2008.
Source: NZTA & Canterbury RLTS 2008-18

These two data sets taken together would tend to suggest that improvements in vehicle safety are driving down the death rate, but poor driver behaviour and increasing volumes of traffic on

the regions' roads are ensuring that serious accidents are continue to happen at an ever increasing rate.

NZTA Crash Analysis System (CAS) data indicates that the top four road safety issues for the region have remained relatively stable over time. These are:

- Bend – loss of control or head-on
- Straight road – loss of control or head-on
- Intersections
- Cyclist crashes

Over the period 2004 to 2008, 34% of bend – loss of control or head-on crashes on local roads involved alcohol and 50% involved speed too fast for the conditions. The corresponding figures for the region's State Highway network are 14% and 39%.

On straight roads, a similar pattern of contributory factors is evident. On local roads, 27% involved alcohol, 19% involved excessive speed for the conditions and 13% involved fatigue.

87% of intersection crashes over the period 2004 to 2008 were in urban areas, with poor observation and failure to give way / stop being the main contributory factors.

Cyclist injuries represent 9% of all casualties from crashes in the Canterbury region, with the number of cyclist injuries almost doubling in the past five years.

Despite the data highlighted above, Cantabrians still think that the roads of New Zealand are a relatively safe place to be. In an annual survey undertaken by MoT, a stable 4 out of 5 state that they believe that New Zealand roads are either a "safe" or "very safe" place to travel on.