Future Demand
New Zealand transport and society: Trends and projections
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New Zealand transport and society: Trends and projections

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This resource paper was prepared as part of the Ministry’s Future Demand project. The project has been examining how New Zealand’s transport system could or should evolve in order to support mobility in the future. The paper provides an assembly of data on trends and projections concerning travel and factors that contribute to the shaping of travel.

This paper is presented not as policy, but with a view to inform and stimulate wider debate.
## Contents

**New Zealand transport and society: Trends and projections** .................................................. 1  
List of Figures .......................................................................................................................... 4  
**Executive summary** ........................................................................................................... 6  
Travel trends .......................................................................................................................... 6  
Demographic trends and projections .................................................................................. 6  
Social trends and projections ............................................................................................... 7  
Economic trends and projections ......................................................................................... 7  
Technology trends .................................................................................................................. 8  
**Introduction** ....................................................................................................................... 9  
Notes on data sources .......................................................................................................... 9  
New Zealand census ............................................................................................................ 9  
New Zealand Household Travel Survey ............................................................................ 9  
Key travel trends in New Zealand ....................................................................................... 10  
Travel time budget ............................................................................................................. 12  
Average kilometres driven per day ..................................................................................... 14  
Reasons for travel .................................................................................................................. 15  
Travel for social and recreational reasons ........................................................................ 16  
Mode share ............................................................................................................................. 17  
Key demographic trends and projections in New Zealand ................................................. 18  
Population growth ............................................................................................................. 18  
Ageing population structure .............................................................................................. 18  
Urbanisation .......................................................................................................................... 19  
Key social trends and projections in New Zealand ............................................................... 20  
Households and families ..................................................................................................... 20  
Housing .................................................................................................................................. 22  
Number of vehicles per household ..................................................................................... 23  
Driver licensing trends ......................................................................................................... 23  
Key economic trends and projections in New Zealand ....................................................... 25  
Household expenditure on transport and travel ................................................................ 25  
The New Zealand vehicle fleet ............................................................................................ 28  
Income and wealth ............................................................................................................... 29  
Employment growth ............................................................................................................ 30  
Unemployment forecasts ...................................................................................................... 33  
Economic growth and forecasts ......................................................................................... 33  
Changing economic structure ............................................................................................ 34  
Key technological trends in New Zealand .......................................................................... 35  
Household expenditure on communications and technology ......................................... 35  
Internet access and use, and telephone access .................................................................. 36  
Household access to the internet – devices ........................................................................ 36  
Use of the internet for shopping ......................................................................................... 36  
Use of the internet for social networking ............................................................................ 37
Appendix 1 ........................................................................................................................................... 38
New Zealand Household Travel Survey travel purpose definitions ................................................. 38
Appendix 2 ........................................................................................................................................... 39
Income decile groups used in household expenditure analysis ......................................................... 39
Appendix 3 ........................................................................................................................................... 41
Selection of literature on transport trends and drivers ................................................................... 41
List of Figures

Figure 1: Total travel by road 2001 to 2013.................................................................10
Figure 2: Total vehicle kilometre travel by road per capita (vehicle km/person) with percentage change from previous year also shown .................................................................10
Figure 3: Person kilometres travelled per year and per capita in light four-wheeled vehicles, for people aged 5 years and over (Household Travel Survey) .........................................................11
Figure 4: Person kilometres per capita in light four-wheeled vehicles by selected region* (Household Travel Survey) .................................................................12
Figure 5: Time spent travelling per person (aged 5+ years) per day (Household Travel Survey) ....13
Figure 6: Time spent travelling by mode per person per day (Household Travel Survey, 2010-2013) 13
Figure 7: Distance driven in light four-wheeled vehicles per driver per day, by age and gender (Household Travel Survey) .................................................................14
Figure 8: Time spent driving per driver per day, by age and gender (Household Travel Survey) ....14
Figure 9: Distance travelled by travel purpose (Household Travel Survey) .........................15
Figure 10: Distance driven per driver per week for shopping, personal business, medical or social welfare reasons combined (Household Travel Survey) ........................................16
Figure 11: Distance driven per driver per week for social or recreational purposes (Household Travel Survey) .................................................................16
Figure 12: Mode share of total trips legs people aged five years and over (Household Travel Survey) .................................................................17
Figure 13: New Zealand population projections (Statistics NZ) ........................................18
Figure 14: Current and projected New Zealand age pyramid (Statistics NZ) .........................19
Figure 15: Projected populations for regional council areas (Statistics NZ, medium projection) ....19
Figure 16: Total annual household numbers by household type (Household Travel Survey) ........20
Figure 17: Projected households by household type (Statistics NZ) ....................................21
Figure 18: Percentage of households that are owned, partially owned, or held dwelling in family trust (Statistics NZ) .................................................................22
Figure 19: Percentage of households where housing costs are greater than 30 percent of disposable income ..................................................................................22
Figure 20: Number of household vehicles (light four-wheeled vehicles) (Household Travel Survey) ....23
Figure 21: Percentage of people aged over 15 years old with a full car licence (Household Travel Survey) .................................................................24
Figure 22: Household expenditure on transport as percentage of total net expenditure (Statistics NZ) .................................................................25
Figure 23: Consumers Price Index for two transport and travel subgroups (Statistics NZ) ........26
Figure 24: Real petrol prices (Statistics NZ, Ministry of Business, Innovation and Employment) ....26
Figure 25: Average weekly expenditure on transport by income group deciles (Statistics NZ) ........27
Figure 26: Percentage of expenditure on transport spent on private passenger supplies (includes petrol) and services (Statistics NZ) .................................................................27
Figure 27: Average age of the light passenger vehicle fleet (Ministry of Transport NZ) ..........28
Figure 28: Light vehicle registrations for new and used vehicles by year (Source: Ministry of Transport) .................................................................28
Figure 29: Real gross national disposable income per person (Statistics NZ) .........................29
Figure 30: Full-time and part-time employment by gender (Statistics NZ) ............................30
Figure 31: Male/female split of full time and part time employment (Statistics NZ) ................30
Figure 32: Labour force participation rates by broad age groups (Statistics NZ) ....................31
Figure 33: Numbers of persons employed by industry group (Statistics NZ) ..................................................32
Figure 34: Unemployment rate — June year (Treasury) ..................................................................................33
Figure 35: Real GDP percentage change per annum - June year (Treasury) ......................................................33
Figure 36: Historical share of GDP, June Quarter 1987 (Statistics NZ) ...........................................................34
Figure 37: CPI for selected telecommunications and computing equipment subgroups (Statistics NZ) ...........................................................35
Figure 38: Number of people making online purchases in the last four weeks (Statistics NZ) ..............37
Figure 39: Internet users accessing social networking (Statistics NZ) ..........................................................37
Executive summary

New Zealand’s transport and society is changing over time and will continue to do so. This paper provides a compendium of information concerning trends and projections in travel and in factors that contribute to the shaping of the nature and extent of travel demand. The purpose of its preparation was to inform and support the work undertaken by the Ministry of Transport in its Future Demand project during 2014. This project has examined how New Zealand’s transport system could or should evolve in order to support mobility in the future.

The key trends and projections are summarised below.

Travel trends
► Overall vehicle kilometres travelled (VKT) increased 8.9 percent from 2001 to 2004, but was almost unchanged from 2005 to 2012. It increased by 1.6 percent in 2013, and is now in line with the previous highest level of 40.4 billion kilometres in 2007.
► Since approximately the year 2000, the national average annual distance travelled per person as either a driver or a passenger in a private vehicle has declined by 7.8 percent, from a maximum of 11,500km in the period 2003–2007 to 10,600km in the period 2009–2013.
► Time spent travelling per person per day currently averages just under 1 hour per day, but varies between nearly 40 minutes per day for 0 to 4 year olds, steadily increasing to over 1 hour and 10 minutes for 45 to 54 year olds, before declining down to just over half an hour per day for those 75 years and older.
► Males continue to drive more kilometres per day than females, although the amount women drive has increased over time. The amount of driving increases into middle age and then declines as people get older. However, in recent years older people have continued to drive for longer.
► Other than travelling to home, the travel purposes associated with the most kilometres travelled are personal business/shopping/medical, and social visits. These account for over 40 percent of kilometres travelled recorded in the 2009–2012 Household Travel Survey.

Demographic trends and projections
► New Zealand’s population is projected to top five million by 2026 and six million by 2061. However, the rate of growth is slowing and New Zealand’s rate of natural increase from births is currently below the replacement rate.
► By the early 2020s, people aged 65 and over are projected to outnumber children.
► New Zealand is becoming more urbanised, with Auckland in particular projected to grow significantly in the next 20 years. The population in the Auckland region is projected to reach almost two million by 2031 (a 43 percent increase from 2006 based on medium projections).
Social trends and projections

► The number of households is expected to increase from 1.55 million in 2006 to 2.09 million by 2031, at an average annual growth rate of 1.2 percent. Households containing just one or two people are expected to account for half this growth.

► The average number of people per household in 2013 was 2.7. This is projected to fall to 2.4 by 2031.

► Home ownership by households has declined over the past 22 years. The percentage of households for whom housing costs are greater than 30 percent of their income rose from 18 percent in 1991 to 27 percent in 2013.

► Over the last 20 years, the trend has been for New Zealand households to own more cars. In 2010–2013, 60 percent of households had two or more cars.

► The proportion of 15 to 24 year olds with a full driver licence has declined since 1989. Some, but not all, of this is due to raising the learner licence age from 15 to 16 years in 2011.

Economic trends and projections

► Average household expenditure on transport and travel has remained around 14 percent of net household expenditure over the past 6 years.

► The average household in New Zealand spent $158 per week on transport services in 2013.

► Households in the top 10 percent of income spend almost six times ($339.80) as much on transport as households in the bottom 10 percent ($59.70).

► At current entry and scrappage rates, the New Zealand light vehicle fleet will take about 30 years to turn over.

► Expenditure on communications (which includes telecommunications services and equipment) has remained constant at around 3 percent of total household expenditure.

► Real disposable income per person dropped by 2.8 percent in 2009 after the global financial crisis but has increased since then.

► Total employment has growth by about 1 percent per annum over the past five years.

► Over time, there has been an increase in women in the workforce in terms of absolute numbers and as a proportion of the total number employed. Females are now 47 percent of those employed, compared to 42 percent in 1987.

► Females are more likely to be in part-time employment.

► Unemployment statistics show the national rate has stayed constant at 6 percent although there are differences around the country.

► Service sectors have been growing in real terms and as a proportion of the economy and now represent over 50 percent of Gross Domestic Product (GDP). Manufacturing has still been growing but at a slower rate and so has declined as a percentage of the economy. Primary industries (agriculture, fishing and forestry) have been variable as a proportion of the economy.
Technology trends

► By Consumer Price Index (CPI), telecommunications services (which includes telephone lines) dropped by almost a quarter (23 percent), whereas telecommunications equipment is now less than one-tenth of the price it was in June 1999 (a 93 percent drop in the CPI subgroup).

► By CPI, audio-visual and computing equipment dropped 77 percent between June 1999 and June 2014 so it is now a quarter of the price that it was in June 1999.

► In 2012, four out of five New Zealand homes had access to the Internet, up five percent since 2009.

► Eight percent of households had an internet-enabled phone in 2009, and this had increased to 34 percent by 2012.

► In 2012, 54 percent of the population had made online purchases within the last 12 months. This compares to 43 percent in 2009.
Introduction

This paper is a review of the New Zealand data and literature on historic and projected drivers of travel demand. It explores the current and past domestic personal travel trends and the demographic, social, technological and economic factors that have the potential to drive travel demand. It also provides a summary of selected literature on drivers and trends, both national and international. This paper was prepared as part of the Ministry’s Future Demand project. The project has been examining how New Zealand’s transport system could or should evolve in order to support mobility in the future. The paper does not purport to be a comprehensive coverage of all aspects of New Zealand society and determinants of travel demand, but seeks to offer some important insights into stability and change by examining the past and looking to the future.

Notes on data sources
To support the trends observed, a variety of data sources have been employed. While some are available continuously or available on an annual basis, two of the most detailed data sources are discrete and slightly variable in the timing. These are detailed below.

New Zealand census
The New Zealand census is undertaken every five years. However, the census scheduled for 2011 was postponed to 2013 because of the Christchurch earthquakes. This introduces a discontinuity in the time series; therefore, care should be exercised when comparing trends over the different time periods.

New Zealand Household Travel Survey
Detailed surveys of household travel in New Zealand have been undertaken on three occasions. The first was carried out by the Ministry of Transport during 1989/90 and included nearly 9,000 people aged 5 years and over. The second survey was undertaken by the Land Transport Safety Authority in 1997/98, surveying over 14,000 people of all ages. The third survey (undertaken by the Ministry of Transport) is ongoing and started in 2003. It is designed to sample a smaller number of households per year, so several years’ data needs to be aggregated for analysis. Between 2003 and 2008, approximately 2000 households per year were sampled, but from 2008 this was expanded to 4500 households per year. Because of these discrete surveys and the survey design, it is not a continuous time series, and for the ongoing survey, annual updates include overlapping time periods. More information on the survey is available at www.transport.govt.nz/research/travelsurvey/.
Key travel trends in New Zealand

This section examines the key travel trends observed in New Zealand. As well as looking at total vehicle kilometres travelled (VKT), we examine the concept of the average time spent travelling per person per day (travel time budget), the average distance driven per day, and reasons for travel, focusing on trends in social and recreational travel.

Overall VKT increased 8.9 percent from 2001 to 2004, but was relatively unchanged from 2005 to 2012. VKT increased by 1.6 percent in 2013, and is now in line with the previous highest level of 40.4 billion in 2007 (Figure 1).

![Figure 1: Total travel by road 2001 to 2013](image)

Annual average VKT per capita (regardless of motorised vehicle type) in New Zealand stayed relatively stable between 2001 and 2005, before declining between 2006 and 2012 (Figure 2). The most recent figures for 2013 show an increase of 0.8 percent. Overall, it has declined by 4 percent between 2003 and 2013. Light vehicle travel per capita (that is in vehicles under 3.5 tonnes) declined by 5.8 percent over the same time period.

![Figure 2: Total vehicle kilometre travel by road per capita (vehicle km/person) with percentage change from previous year also shown](image)
The Household Travel Survey provides information at the household level (that is, it excludes heavy vehicle travel, commercial vehicle travel, and professional driver travel), and gives the total travel done per person as either a car/van driver or passenger. Since about 2000, the national annual average has declined by 7.8 percent from a maximum of 11,500km per person in the period 2003–2007 to 10,600km per person in the period 2009–2013 (Figure 3).

Figure 3: Person kilometres\(^1\) travelled per year and per capita in light four-wheeled vehicles, for people aged 5 years and over (Household Travel Survey)

\(^1\) Person kilometres refers to driver and passenger travel.
This trend is not observed for all regions. Examining a select set of the larger regions shows the Bay of Plenty has experienced an appreciable increase in average travel per person (Figure 4). It is unclear why this is the case.

![Graph showing travel per person per year by region](image)

* NB Post 2004 year data points are based on the average of 4 years of data per point.

Figure 4: Person kilometres per capita in light four-wheeled vehicles by selected region* (Household Travel Survey)

* Selected regions cover approximately 73 percent of NZ population

Travel also varies more generally by area of residence. In the period 2008–2013, for example, people living in urban areas (where the population is 30,000 people and over) drove an average of 6,730km per person per year, whereas those in rural areas drove 8,160km per person per year.

**Travel time budget**

As well as looking at distances travelled, we can examine average total time spent travelling per person per day (also known as ‘travel time budget’). Figures from the Household Travel Survey show a total travel time of between 61 and 64 minutes per person per day, between 1989/90 and 2006–2009, declining to 59 minutes per person per day by 2010–2013 (Figure 5). Examined in more detail, the time spent travelling per day varies most by age, with the oldest and youngest people averaging less than 50 minutes travelling per day, while those 45 to 54 years old averaging over 70 minutes travelling per day (Figure 6).
Figure 5: Time spent travelling per person (aged 5+ years) per day (Household Travel Survey)

Figure 6: Time spent travelling by mode per person per day (Household Travel Survey, 2010-2013)
Average kilometres driven per day

Focusing on driver travel, males continue to drive more kilometres per day than females, with the greatest difference in terms of distance in the 55 to 64 age groups (Figure 7). The smallest difference is in the 15 to 24 age groups. The number of kilometres declines significantly for males in the 65 to 74 age groups compared to the 55 to 64 age group. This may be related to their retirement from the workforce. The driving patterns for females may change if more women enter the workforce. A similar pattern is observed for time spent driving per day (Figure 8).

Figure 7: Distance driven in light four-wheeled vehicles per driver per day, by age and gender (Household Travel Survey)

Figure 8: Time spent driving per driver per day, by age and gender (Household Travel Survey)
Reasons for travel

As well as looking at what travel is undertaken, it helps to understand why travel is undertaken. The New Zealand Household Travel Survey collects information on the travel purpose/reasons for travel. An explanation of what the travel purposes are is available in Appendix 1 New Zealand Household Travel Survey travel purpose definitions.

Other than travelling to home, the reasons associated with the most kilometres travelled are personal business/shopping/medical, and social visits (Figure 9). These reasons account for over 40 percent of kilometres travelled in the 2009–2012 Household Travel Survey. Travel for recreation has declined most over the course of the surveys (28 percent). Travel to get to work has remained steady overall.

Figure 9: Distance travelled by travel purpose (Household Travel Survey)
Travel for personal, shopping, medical and social welfare reasons shows the peak and then decline in kilometres driven for personal business/shopping/medical and social welfare reasons as a function of age. The trend for males and females is similar, although younger males drive less than females for shopping reasons.

![Figure 10: Distance driven per driver per week for shopping, personal business, medical or social welfare reasons combined (Household Travel Survey)](image)

**Travel for social and recreational reasons**

Over the time series of the Household Travel Survey, women are generally driving more for social and recreational reasons than previously (Figure 11). However, the trend is less clear by age.

In contrast, men have been driving less for social and recreational reasons over the years; however, they have the same pattern in terms of the older age groups driving more on average per week than the younger age groups.

![Figure 11: Distance driven per driver per week for social or recreational purposes (Household Travel Survey)](image)
Mode share

Light four-wheeled vehicles dominate the mode share, with 78 percent of trips done by car/van either as a driver or a passenger in the 2009–2013 survey period (Figure 12). In the same time period, active modes accounted for 17 percent of total trip legs while public transport accounted for just fewer than 3 percent.

![Figure 12: Mode share of total trips legs people aged five years and over (Household Travel Survey)](image)

In urban areas, active modes have a slightly greater share of trips at 19 percent. The regions with the highest trip share for public transport are the Wellington region (4.5 percent) followed by Auckland (3.7 percent). Annual boardings per capita increased from 22.3 in 2000/01 to peak at 30.1 in 2011/12, before dropping slightly to 29.9 in 2012/13.
Key demographic trends and projections in New Zealand
This section examines demographic trends and projections in terms of population increases, examining the changes in both age structure and where people live.

**Population growth**
New Zealand’s population is projected to top five million by 2026 and six million by 2061. However, the rate of growth is slowing and New Zealand’s rate of natural increase from births is below the replacement rate (Figure 13).

![Population Projections (2011 Base)](image)

**Figure 13: New Zealand population projections (Statistics NZ)**

We are dependent on positive net migration for our population growth. According to the 2013 census data, about one quarter of New Zealand’s population was born overseas. While 34 percent of these were born in Europe (down from 41 percent in 2001), over 30 percent were born in Asia, up from 24 percent in the 2001 census.

**Ageing population structure**
In 1976, about 9 percent of the population was aged 65 and over; in 2011 this number rose to 14 percent and is predicted to be over 20 percent by 2031. By the early 2020s, people aged 65 and over are projected to outnumber children (Figure 14). In addition, the percentage of people aged 65 years and over who are employed has almost doubled since 2001.
Urbanisation

New Zealand is becoming more urbanised, with Auckland in particular projected to grow significantly in the next 20 years. The population in the Auckland region is projected to reach almost two million by 2031 (a 43 percent increase from 2006). (These projections are sourced from Statistics New Zealand). Regional population projections are shown in Figure 15.

Note: Statistics New Zealand produces three projections (low, medium, and high) incorporating different fertility, mortality and migration assumptions for each geographic area to illustrate a range of possible scenarios. The medium series is consistent with the median projection (50th percentile) of the National Population Projections: 2011 (base)–2061 (released July 2012).
Key social trends and projections in New Zealand

This section examines the social trends observable in New Zealand. It looks at the projected changes in household structure, housing and housing affordability trends, trends in the number of vehicles per household and changes in driver licensing levels by age.

Households and families

The number of households is expected to increase from 1.55 million in 2006 to 2.09 million by 2031, at an average annual growth rate of 1.2 percent. Households containing just one or two people are expected to account for half this growth. Over three-quarters of those households will be in the North Island. The area with the slowest growth is expected to be the West Coast of the South Island (0.3 percent per annum in medium growth scenarios), while the fastest area is expected to be Auckland (1.8 percent per annum in medium growth scenarios). Figure 16 shows the total number of households for various household types.

The average number of people per household in 2013 was 2.7. This is projected to fall to 2.4 by 2031. There are differences for each island, with the North Island average projected to fall from 2.7 to 2.5, while the South Island average is projected to fall from 2.5 to 2.2 people per household.

In 2013, the proportion of households averaging more than two people per bedroom was 1.2 percent; the proportion of households averaging more than two bedrooms per person was 12.1 percent.

Figure 16: Total annual household numbers by household type (Household Travel Survey)

NB: Post 2004 year data points are based on the average of 3 years of data per point.
The number of couples without children is projected to increase to more than 700,000 by 2031, a growth rate greater than that of two-parent families or solo parent families (Figure 17).

The changes in marriage and divorce rates can reflect changes in household dynamics. Separation and divorce can potentially lead to more complex transport patterns. Both marriage and divorce rates have dropped over the past two decades, although the divorce rate has dropped only slightly. Remarriages were 30 percent of total marriages in 2013 compared to 35 percent in 1993. Forty-two percent of divorces in 2013 involved children, compared to 51 percent in 1993.

Figure 17: Projected households by household type (Statistics NZ)
**Housing**

**Affordability**

Home ownership by households has declined over the past 22 years (Figure 18). At the same time, house prices have risen faster than incomes, making owning a home less affordable for those on lower incomes. The percentage of households for whom housing costs are greater than 30 percent of their income rose from 18 percent in 1991 to 27 percent in 2013 (Figure 19).

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**Figure 18:** Percentage of households that are owned, partially owned, or held dwelling in family trust (Statistics NZ)

**Figure 19:** Percentage of households where housing costs are greater than 30 percent of disposable income

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Source: Statistics NZ and Ministry of Social Development
**Housing density**

There is a move to denser housing, which is very noticeable in central Auckland and Wellington City. According to the 2001 Census, central Auckland and Wellington City had 28 and 30 percent of private dwellings respectively that were two or more flats/townhouses/apartments joined together. The national average for this type of construction in 2001 was 15 percent.

In 2013, central Auckland and Wellington City had a higher percentage of dwellings (36 and 35 percent respectively) that were two or more flats/townhouses/apartments joined together. This compares to the national average of 17 percent.

**Number of vehicles per household**

Over the last 20 years, the trend has been for New Zealand households to own a greater number of cars. This trend is shown in both the Census data and the New Zealand Household Travel Survey although with different degrees of magnitude. The Census data shows a lower average of vehicles per household than the Household Travel Survey.

![Figure 20: Number of household vehicles (light four-wheeled vehicles) (Household Travel Survey)](image)

**Driver licensing trends**

The proportion of people in the different age cohorts shows different trends between younger people and older people (Figure 21). The most recent fall in the proportion of 15- to 24-year-olds holding a full licence could be attributed in part to recent changes that made driving tests more difficult, and an increase in the minimum licence age for learners in 2011, reducing the number of people obtaining their licence. Between 1997/98 and 2005–2008 the 25- to 34-year-old age group shows a similar trend of decline in holding a full driver licence as the 15- to 24-year-olds. However, this age group shows a small increase in the proportion holding a driver licence since then.
Figure 21: Percentage of people aged over 15 years old with a full car licence (Household Travel Survey)

Note: After 2004, data points are based on the average of 3 years of data per point.
Key economic trends and projections in New Zealand

This section examines key economic trends in New Zealand. It starts at the household level, focusing on household expenditure (and the role of transport, including new vehicle levels), before moving out to a national level to examine real national disposable income and employment trends. Unemployment and economic growth forecasts are then examined, before looking at the structure of the economy through the makeup of the Gross Domestic Product (GDP).

Household expenditure on transport and travel

![Chart showing household expenditure on transport and travel as a percentage of total net expenditure]

Figure 22: Household expenditure on transport as percentage of total net expenditure (Statistics NZ)

Average household expenditure on transport and travel\(^2\) has remained at around 14 percent of net household expenditure over the past six years (Figure 22). Over that timeframe, the change in the Consumer Price Index (CPI) has varied for the subgroups (Figure 23). The CPI subgroup for the purchase of vehicles has shown little change, increasing by 1.5 percent. This subgroup has shown little change since 1999, and the latest index for the June 2014 is 0.8 percent below its June 1999 level. In contrast, the CPI subgroup for private transport supplies and services (which includes fuel) has increased by 21 percent over the past six years and 115 percent between June 1999 and June 2014. In real terms, petrol price has increased by 68.5 percent between 1999 and 2013 (Figure 24).

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\(^2\) The category of transportation and travel comprises three sub-categories: Purchase of vehicles, private transport supplies and services, and passenger transport services. Purchase of vehicles includes new and second hand cars, motorbikes and bicycles. Private transport supplies and services includes fuel, maintenance, parts and accessories, parking costs, WOF/inspection fees, road user charges and the like. Passenger transport services includes domestic and international airfares, airport and customs, ferry charges, public transport, taxis and so on.
The average household in New Zealand spent $158 per week on transport services in 2013 (Figure 25). Households in the top 10 percent in terms of income spend almost six times ($339.80) as much on transport as households in the bottom 10 percent ($59.70). More information on the income groups is available in Appendix 2 Income decile groups used in household expenditure analysis.
Expenditure on private passenger supplies and services (which includes expenditure on petrol) consumes the lion’s share of household transport spend. In 2013, households in the second income decile (earning between $22,800 and $32,099 per year) spent 70 percent of their transport costs on private passenger supplies and services (Figure 26).

Expenditure on the purchase of vehicles (new and second hand) was 36 percent of households’ transport expenditure in 2007, before dropping to 29 percent in 2010, then rising slightly to 30 percent in 2013. It is difficult to get data across all the decile income groups as the sample is too small for the income groups below the seventh decile. In New Zealand, new vehicles are more likely to be purchased by fleet operators than by private individuals.
The New Zealand vehicle fleet


Over the past 14 years, the average age of the light vehicle fleet has increased by 17 percent from 11.5 years to 13.5 years (Figure 27). The Ministry’s fleet turnover model estimates that the New Zealand fleet will get younger but the fall in the average age will not start until after 2020. At current entry and scrappage rates, the New Zealand light vehicle fleet will take about 30 years to turn over.

![Figure 27: Average age of the light passenger vehicle fleet (Ministry of Transport NZ)](image)

**Light vehicle registrations**

Light vehicle registrations are additions to the New Zealand vehicle fleet. Data from the past 14 years show total registrations peaked in 2005 at almost 265,000 before dropping to 146,000 in 2009 (Figure 28).

![Figure 28: Light vehicle registrations for new and used vehicles by year (Source: Ministry of Transport)](image)
Since vehicle import rules were liberalised in the late 1980s, New Zealand generally has imported a greater proportion of used light vehicles to new light vehicles. The breakdown between passenger and commercial vehicles shows some important differences. New Zealand imports a greater proportion of used passenger vehicles than new passenger vehicles. However, this proportion has dropped from a roughly 70/30 split in 2003 to a 55/45 split in 2013.

In contrast, New Zealand imports more new than used commercial vehicles — over five times as many new as used commercial vehicles were imported in 2013.

New Zealand imports around 80 percent of its new and used vehicles from Japan, and up to 90 percent of its used vehicles are from Japan. Therefore, the light vehicles available here reflect a selection of what is available in the Japanese market, albeit it with a time lag. Currently, one-third of standard light vehicle sales in Japan are hybrid vehicles; however, New Zealand continues to import predominantly petrol and diesel vehicles.

**Light petrol vehicles fuel efficiency**

Fuel efficiency for light petrol vehicles depends on a number of factors, including engine size. While fuel efficiency has improved for comparable engine sizes, the average engine size increased in New Zealand, and vehicles with larger engines on average tend to travel the most vehicle kilometres. Currently, New Zealand’s light fleet petrol fuel efficiency averages at 9.87 litres per 100km. Because of New Zealand’s fleet turnover and current technical constraints, this is unlikely to be able to improve beyond 7 litres per 100km over the next 30 years.

**Income and wealth**

Real disposable income per person dropped by 2.8 percent in 2009 after the global financial crisis but has increased since then; it would have been boosted by the cuts in income tax rates in October 2010 and it levelled off in 2013 compared to 2012 (Figure 29).

![Figure 29: Real gross national disposable income per person (Statistics NZ)](image-url)
Employment growth

Total employment has grown by about one percent per annum over the past five years.

Source: Statistics New Zealand InfoShare downloaded 7 May 2014

Figure 30: Full-time and part-time employment by gender (Statistics NZ)

More women are in the workforce both in terms of numbers and as a proportion of the total number employed. Females now comprise 47 percent of those employed, compared to 42 percent in 1987. Females are more likely to be in part-time employment.

Source: Statistics New Zealand InfoShare downloaded 7 May 2014

Figure 31: Male/female split of full time and part time employment (Statistics NZ)
Labour market participation by age

Two important policy changes have impacted on labour market participation. The age for receiving New Zealand superannuation started to be gradually increased from 60 years in 1992 to 65 years in 2001. In 1993, the school leaving age was raised from 15 years to 16 years. There were other changes in education policy to encourage more school leavers to enter tertiary education or occupational training. Figure 32 shows the percentage of young people (between 15 and 24 years old) in the labour force decreased from 74 percent in 1987 to 61 percent in 2014. The participation rate for people over the age of 65 years has more than doubled over the same period, increasing from 9 percent to 21 percent.

Employment by industry

The total number of people employed impacts on the demand for travel. For some sectors, personal travel is essential for work. However, in other sectors (the service orientated sectors) some travel for work purposes could be replaced in the future by virtual activity.

The numbers of people employed grew by 20 percent between 2003 and 2014. Figures available by industry groups (Figure 33) show that the largest employment sector (at 31 percent of the total number of people employed) is government administration and defence, community and personal services (which includes education and training, healthcare and social services). The financial, insurance, rental, real estate, and various support services sector has had the strongest growth between 2003 and 2014, at 39 percent.
Employment numbers in the agriculture, fishing and forestry sector have dropped 13 percent over the same period and that sector now only accounts for six percent of people employed in 2014, compared to over eight percent in 2003.

The mining, manufacturing, electricity, gas and water, and construction industry group has mixed results within the group. Numbers employed in manufacturing fell by 12 percent between 2003 and 2014, and as a proportion of total numbers employed, it fell from 14.5 percent to 11 percent. The employment numbers in the mining sector grew significantly (83 percent) over the time period, albeit from a small base (0.2 percent of total numbers employed). Most of the growth in the mining sector occurred between 2004 and 2007. Growth in the construction sector over the time period was almost 49 percent. However, half that growth has occurred in the last four quarters and is most likely attributable to the Canterbury rebuild following the earthquakes in 2010 and 2011. As such, the growth rate is not expected to be maintained.

At 12.5 percent for the period, employment growth in the wholesale, retail, accommodation and restaurants, transport and communications sector was lower than total growth in employment. Only the transport, postal and warehousing sub-sector maintained its share of total employment. Retail trade and accommodation employment numbers grew at the slowest rate (10 percent) in this sector.
Unemployment forecasts

Latest (March 2014 quarter) unemployment statistics show the national rate has stayed constant at 6 percent, although there are differences around the country — Auckland has an unemployment rate of 7.3 percent while Christchurch’s has dropped to 3.3 percent. More people are finding employment and more are entering the workforce. Figure 34 shows historic and forecast unemployment rates.

Economic growth and forecasts

New Zealand’s economy grew reasonably strongly from 1999 to 2007. The severe drought that occurred in 2007/08 is estimated to have reduced economic activity by up to $2.8 billion. This was then followed by the global financial crisis, which impacted on the wider economy. Since 2011 growth rates have been close to three percent per annum. Treasury forecasts show that economic growth is expected to continue at around 2 percent to 2.5 percent.
**Changing economic structure**

The structure of the New Zealand economy has changed in line with other western economies. Service sectors have been growing in real terms and as a proportion of the economy, and are now over 50 percent of GDP. Manufacturing has still been growing but at a slower rate and so has declined as a percentage of the economy. Figure 36 shows the changes in the relative proportion of the different sectors. Primary industries (agriculture, fishing and forestry) have been variable as a proportion of the economy because production in that sector is often strongly impacted by weather conditions such as the severe drought in 2007/08.

![Comparison of Selected Quarterly GDP by Sector seasonally adjusted, 1995/96 prices](image)

Figure 36: Historical share of GDP, June Quarter 1987 (Statistics NZ)
Key technological trends in New Zealand
This section examines the key trends in New Zealand’s domestic use of technology, focusing on telecommunications through rates of household internet access, the media through which they are accessing it, and the predominance of its use for shopping and social purposes.

Household expenditure on communications and technology
Expenditure on communications (which includes telecommunications services and equipment) has remained constant at around three percent of total household expenditure. Average annual household expenditure on telecommunications services was about $1500 in 2010, and this had increased to $1700 in 2013. Over the same time period, the Consumers Price Index (CPI) showed a drop of 16 percent; this suggests that the amount of services purchased increased by over a third between 2010 and 2013.

Annual household expenditure on telecommunications equipment was an average of $47 in 2010, increasing to $83 in 2013; however, the CPI for the telecommunications equipment subgroup shows a 65 percent decrease over that time period. This suggests that households are able to purchase more for their money. Likewise, average annual household expenditure on computing equipment increased from $192.40 in 2007 to $239.20 in 2013, while the CPI for the subgroup showed a 40 percent fall, suggesting that people are either purchasing more equipment or possibly equipment with a higher specification.

The CPI for telecommunications and computer equipment subgroups for the longer term shows some dramatic changes in prices. Telecommunications services (which includes phone lines) dropped by almost a quarter (23 percent), whereas telecommunications equipment is now less than one-tenth of the price it was in June 1999 (a 93 percent drop in the CPI subgroup). Audio-visual and computing equipment dropped 77 percent between June 1999 and June 2014, so it is now a quarter of the price (Figure 37).

![Figure 37: CPI for selected telecommunications and computing equipment subgroups (Statistics NZ)](image-url)
Internet access and use, and telephone access

According to the 2013 Census, 1.1 million households reported having access to the internet; compared to the 2001 Census, this is up 134 percent (up from under half a million households in 2001). Over 1.2 million households reported having access to a mobile/cellular phone, which is almost on par with those having access to a landline (1.26 million households).

From the Statistics NZ Household Use of Information and Communication Technology Survey: 2012, four out of five New Zealand homes had access to the Internet, up five percent since 2009. Two-thirds of rural households had a broadband connection, up 13 percent since 2009.

The main reason for those not having access to the Internet at home was a lack of interest. However, this figure has declined since 2009 while concern over cost has increased, deterring over one third of households from getting connected.

Household access to the internet – devices

In 2009, 69 percent of households had a desk-top computer; however, this had dropped to 53 percent in 2012. In contrast, 55 percent had a laptop or hand-held computer in 2009, and 70 percent had a laptop or netbook and 18 percent had a tablet or handheld held computer in 2012. Eight percent of households had an internet-enabled phone in 2009, and this increased to 34 percent in 2012.

In 2012, 40 percent of households were using more than one device to access the Internet — this figure has doubled since 2009. Laptops were the most popular means of accessing the Internet in more than two thirds of households in 2012; however, one third of households accessed the Internet via a mobile phone, up 26 percent since 2009.

In 2012, households in the Auckland and Wellington regions had the highest ownership rates of tablets or handheld computers (22 percent and 23 percent respectively), and internet-enabled phones (41 percent and 40 percent respectively).

Use of the internet for shopping

In 2012, 54 percent of the population had made online purchases within the last 12 months. This compares to 43 percent in 2009. Men and women were equally likely to make online purchases, but the older age groups (55 years plus) were less likely to than the younger age groups. Note that only 52 percent of the 15- to 24-year-olds made purchases online. However, that could be related to available income or access to the necessary credit/debit facilities needed to make online purchases. Most people’s purchases were worth less than $500.
Use of the internet for social networking

In 2012, 65 percent of internet users were using it for social networking, compared to 46 percent in 2009. Females (70 percent) were more likely to use the internet for social networking than males (60 percent). Europeans (61 percent) were less likely to use the internet for social networking than Māori (75 percent), Pacific peoples (74 percent) or other ethnicities (74 percent).
Appendix 1
New Zealand Household Travel Survey travel purpose definitions

**Trip purposes/destinations**

- **To home** includes any trip to the home address or any trip returning to the place they are going to spend the night.

- **Work** includes travel to main place of work and travel to any other jobs.

- **Employer’s business**: includes work-related travel other than to and from work (for example, travelling to meetings or clients).

- **Education** is for travel by students only and includes institutions such as primary and secondary schools, and universities. It does not include preschool education such as kindergarten, play, crèche, kōhanga reo, which are included under **social visit/entertainment**, as per the Statistics NZ Time Use Surveys of 1998/1999 and 2009/2010.

- **Shopping** is entering any premises that sells goods or hires them for money. A purchase need not be made.

- **Social visit/entertainment** includes entertainment in a public or private place for example, eating out at a restaurant or food court, picnics.

- **Recreational** includes active or passive participation in sporting activities and travel for which the main goal is exercise.

- **Personal business** includes stops made to transact personal business where no goods were involved. This includes stops made for medical or dental needs and for dealing with government agencies involved with social welfare.

- **Accompany or transport someone** covers when the reason of the travel is to go somewhere for someone else’s purpose.
Appendix 2

Income decile groups used in household expenditure analysis

(see Figure 25 and Figure 26)

Income is before tax and from regular and recurring sources only. Income information is collected from those aged 15 years and over. Income groups are deciles (to the nearest hundred dollars) of household income. Deciles are formed by dividing the population into 10 groups by ranking households in the order of the amount of income they receive. The bottom decile (decile 1) is the lowest 10 per cent of the population for income, while the top decile (decile 10) is the highest 10 percent of the population for income.

<table>
<thead>
<tr>
<th>Decile 1</th>
<th>Decile 6</th>
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<tbody>
<tr>
<td>2007: Under $17,900</td>
<td>2007: $56,600 To $68,699</td>
</tr>
<tr>
<td>2010: Under $20,000</td>
<td>2010: $63,200 To $76,099</td>
</tr>
<tr>
<td>2013: Under $22,800</td>
<td>2013: $68,600 To $82,499</td>
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<thead>
<tr>
<th>Decile 2</th>
<th>Decile 7</th>
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</thead>
<tbody>
<tr>
<td>2007: $17,900 To $26,099</td>
<td>2007: $68,700 To $81,699</td>
</tr>
<tr>
<td>2010: $20,000 To $28,999</td>
<td>2010: $76,100 To $91,699</td>
</tr>
<tr>
<td>2013: $22,800 To $32,099</td>
<td>2013: $82,500 To $99,999</td>
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</table>

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<tr>
<th>Decile 3</th>
<th>Decile 8</th>
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</thead>
<tbody>
<tr>
<td>2007: $26,100 To $33,699</td>
<td>2007: $81,700 To $100,499</td>
</tr>
<tr>
<td>2010: $29,000 To $39,699</td>
<td>2010: $91,700 To $110,099</td>
</tr>
<tr>
<td>2013: $32,100 To $42,599</td>
<td>2013: $100,000 To $123,299</td>
</tr>
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</table>

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<thead>
<tr>
<th>Decile 4</th>
<th>Decile 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007: $33,700 To $44,999</td>
<td>2007: $100,500 To $134,999</td>
</tr>
<tr>
<td>2010: $39,700 To $51,699</td>
<td>2010: $110,100 To $146,999</td>
</tr>
<tr>
<td>2013: $42,600 To $55,499</td>
<td>2013: $123,300 To $164,899</td>
</tr>
<tr>
<td>Decile 5</td>
<td>Decile 10</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>2007: $45,000 To $56,599</td>
<td>2007: $135,000 and Over</td>
</tr>
<tr>
<td>2010: $51,700 To $63,199</td>
<td>2010: $147,000 and Over</td>
</tr>
<tr>
<td>2013: $55,500 To $68,599</td>
<td>2013: $164,900 and Over</td>
</tr>
</tbody>
</table>
Appendix 3
Selection of literature on transport trends and drivers


This paper considers some of the current theories developed to explain the low growth, and sometimes decline, in car use per capita in advanced economies. It is generally agreed that the trends in the last few years must be influenced by world economic problems, but some of the possible changes in trend seem to go back 10 or 20 years in some countries.

Although there are differences of emphasis, the statistical facts of a reduction in historic growth, low growth or stability at national level, and reductions in specific locations, especially in some larger urban areas, seem broadly agreed by most analyses.

Some features appear to be common in many countries, notably changes in young adults’ propensity to get driving licenses (especially teenage men), an apparent weakening of the association between income and mobility, a greater influence of walking, cycling, and public transport on economic prosperity in some of the most successful cities, and the development of e-commerce, telecommuting, and social networks.

A number of broad hypothesis are put forward explaining current observed trends in vehicle kilometres travelled (VKT). These hypotheses are not mutually exclusive and could all be relevant to some degree in explaining the travel patterns that have been observed.

► Interrupted Growth — the decline is temporary and caused by economic issues such as the high price of oil (mid-2000s) followed by recession after the global financial crisis (2008 onwards)
► Travel Saturation — only so much travel is possible and additional increases in physical mobility provide little extra benefit
► Peak Car — broader demographic, gender, attitudinal and cultural trends suggest that the perceived merit of car ownership and use is declining in advanced economies
► Changing Markets — the advent of low-cost airfares may have reduced the amount of long-distance travel undertaken by cars
► Transition to a Digital Age — increased internet use, including more shopping, socialising and working been done online

The paper discusses research needs, and some emerging issues for future transport policies, including the appraisal of large-scale transport infrastructure projects, service provision, pricing, the allocation of risk, and initiatives to reduce car dependence, in the context where forecasts are problematic and contested.
Traffic Growth: Modelling a Global Phenomenon by the Bureau of Infrastructure Transport and Regional Economics, Department of Infrastructure and Transport, Australia, 2012. BITRE Research Report 128

This report provides an overview of the different patterns of traffic growth in 25 countries including New Zealand. It assembles data going back to 1963 on VKT by vehicle type, numbers of vehicles by vehicle type, population, petrol prices, consumer prices and unemployment. It develops a model to forecast VKT based on the assumption that the over-riding explanation of the current patterns of travel demand is that travel per capita has reached a saturation level. It includes an assumption that unemployment is an important explanatory factor in the model, but that it acts as a proxy for consumer behaviour. However the paper does not present any evidence that the unemployment rate is a better explanatory factor than other possibilities, such as gross domestic product (GDP). It concludes that the main driver behind travel demand for most advanced economies in the future will be population growth.

The Future Isn’t What It Used To Be: Changing Trends and Their Implication for Transport Planning by Todd Litman, Victoria Transport Policy Institute, Australia, November 2013.

This report investigates transport patterns in advanced economies. It concludes that the growth in motor vehicle travel seen in the twentieth century is unlikely to continue. Current demographic and economic trends are causing motor vehicle travel to peak in most developed countries. Although automobile transport will continue to be an important mode, saturation of vehicle ownership and travel, ageing population, rising fuel prices, increasing urbanisation, improved mobility and accessibility options, growing health and environmental concerns, changing consumer preferences (particularly among younger people), and changing transport policies are all contributing to reduce automobile travel and increase demand for alternative modes. An increasing proportion of travellers prefer to drive less and rely more on alternative modes, provided they are comfortable, convenient and affordable.

Drivers of Demand for Transport by Aleksandra Simic and Robert Bartels – Frontier Economics, Australia, October 2013. NZTA Research Report 534

The report represents an initial step in identifying a ‘best fit’ methodology for assessing the historical relationship in New Zealand between: 1) economic activity and road freight activity; and 2) income growth and passenger vehicle travel. The objective was to inform the development of demand models by exploring both data availability and analytical steps that should be considered when developing demand models. The recommendations of the paper are about how the NZ Transport Agency should develop its models.


This report describes a National Long-term Land Transport Demand Model (NLTDM) for evaluating transport demand scenarios looking out 30 years and taking account of mega-trends in: population growth dynamics; spatial demographic trends; technology trends; income and economic growth;
industrial composition; and policy. The key variables include: population by region; household composition and age groups; industry by region; an assumed relationship between GDP per capita and household incomes; vehicles per household; assumptions regarding freight intensity and freight mode share by industry by region; long-run exchange rates; inflation; oil prices; vehicle imports; scrappage rates; new registrations; types of vehicle; emissions factors; travel behaviour and congestion impacts; VKT by vehicle age and by region; propensity to travel by public transport; VKT cost and income elasticities, public transport fuel price and income elasticities. It does not include any variables that could be used to test changes in behaviour (for example those associated with increasing use of the internet for various purposes). Population density is an assumption rather than a variable. The model tends to produce results in line with the Interrupted Growth Hypothesis of travel demand.


This paper presents the findings from an econometric analysis of public transport patronage growth for a selection of New Zealand cities: Auckland, Wellington, Hamilton and Tauranga. The primary objective of the econometric analysis was to provide an explanation of historic growth patterns and, in doing so, provide up-to-date public transport elasticities for use by transport planners and policy analysts. The econometric methods employed differ from conventional approaches because they used panel data models to analyse patronage patterns at a disaggregated level (that is, bus route, bus corridor or train line) rather than at a network or city level.

**Z Forecasting Model**

The Z Energy Forecasting Model received some media attention in April 2014, when the New Zealand Herald picked up on comments by the Chief Executive of Z Energy under the headline “Skyping grannies dent petrol sales: Z boss”. Z Energy has developed a model where the key variables explaining petrol sales are GDP growth, petrol price and broadband connections. The Z Energy model used broadband connections to estimate that a one percent improvement in broadband connectivity would cause a drop of 200 million litres a year in national fuel demand, more than the impact of GDP growth, population, fleet turnover, vehicle efficiency and petrol price. They have found that the best three explanatory variables for VKT in recent years are GDP, petrol prices and broadband connections. An issue with this model is the short time series available for broadband connections compared to GDP and petrol price figures. Also, once connections reach a saturation level, usage may become more relevant as an explanatory variable.