

HOW NEW ZEALANDERS TRAVEL

Trends in New Zealand household travel 1989 - 2008

June 2009



Contents

Foreword	01	Cycling	26
Introduction	02	Risk	28
Method	03	Fragility	29
How New Zealanders travel	04	Risk: all modes	30
Travel distance	04	A snapshot of driver risk	32
Time spent travelling	05	A snapshot of passenger risk	34
Age group travel patterns	06	A snapshot of pedestrian risk	36
Regional travel	08	A snapshot of cyclist risk	38
Regional trends	10	Motorcycling risk	39
Reasons for travel	12	List of tables	40
Travel purpose by age group	14	List of figures	41
Travel to work	14	References	42
Travel to school	16	Additional information	42
Driver travel	18	Glossary	43
Driving experience	20		
Travel as a car passenger	23		
Walking	24		



Foreword



The Ministry of Transport's ongoing Household Travel Survey provides an overview of how our changing society is travelling.

Martin Matthews
Chief Executive

Whether our journeys are across cities, the length of the country, or just down the road, these surveys show that overall, New Zealanders are travelling further and spending longer using our transport network.

We are spending more time in our cars. On average New Zealand adults now spend four and three quarter hours a week driving, compared to less than four hours 20 years ago.

Similarly, school travel patterns have changed. In 1989/90 more than half of our primary school children walked or cycled to school. Now, less than a third do.

Road safety continues to be a challenge for the government as we increase our efforts to reduce the road toll.

This report presents the results of three separate Household Travel Surveys. They highlight the sobering fact that young drivers aged between 15-19 are most likely to be involved in fatal or injury crashes per kilometre driven. Young male drivers in this age group are 11 times more likely to be involved in a fatal or injury crash than male drivers aged 55-59.

With the increase in motorcycling in recent years, we need to respond to evidence showing motorcyclists are 17 times more likely to be killed or injured in a crash for the same distance travelled as car drivers.

The trends identified in the Household Travel Surveys contribute to the Ministry's ongoing monitoring of the transport system. The *Transport Monitoring Indicator Framework* (TMIF) contains a large set of transport sector-related headline indicators that monitor trends over time.

There are a number of challenges ahead for the transport sector. As travel behaviours change, so too must our approach to meeting them. The information gathered in this study will play a valuable role in informing the policy decisions that will lead us into the future.

Martin Matthews
Chief Executive
Ministry of Transport

Introduction

The New Zealand Household Travel Survey gathers information about daily personal travel in New Zealand. Survey participants from throughout New Zealand report how, when and where they travel during a specified two-day period. The results help us to monitor changes in household travel and road safety risk.

This report presents information about the travel patterns of New Zealanders and how these have changed over the last 20 years. It includes a look at how and why we move around, and how the risk of crashing has changed over the last two decades.

This report presents the results of three separate Household Travel Surveys. The first was carried out by the Ministry of Transport during 1989/90, and included nearly 9,000 people aged five and over. The second survey, in 1997/98, was carried out by the Land Transport Safety Authority with funding from the Road Safety Trust. Over 14,000 people of all ages responded to the survey. The increased sample size allowed regional analyses for the first time.

The current survey began in mid 2003 and is ongoing. This survey has been designed to sample a smaller number of households per year, so that a number of years' data can be aggregated for analysis. From 2003 to 2008, approximately 2,000 households per year were sampled, resulting in responses from about 3,500 people each year. From June 2008, the survey has been expanded to sample 4,500 households per year.

Each of the three surveys has used the same core questionnaire and methodology, so the results can be compared over the last 20 years.

The Travel Survey collects household and personal travel information. It does not aim to collect information on movement of freight, or travel as a professional driver (eg a bus, taxi or truck driver). However, work-related travel that is part of another type of job (such as travel between jobs by a plumber, or going to meetings) is included.



The Household Travel Survey began in 2003. Two earlier surveys were carried out in 1989/90 and 1997/98.

Photo courtesy of NZTA

Method

The survey is based on personal interviews with each member of a participating household. Households are selected from cities, towns and rural areas throughout New Zealand*.

Clusters of households (known as census meshblocks) are randomly selected within each local government region. A pre-determined number of clusters are chosen from urban and rural areas within each region. Addresses to be surveyed in the current year are then chosen from within these clusters, and each address (household) is allocated two consecutive 'travel days'. These travel days are spread throughout the year, so that on every day of the year, some households are recording their travel.

Before their travel days, each selected household is sent an introductory letter and brochure introducing the survey and their interviewer. Once the household agrees to participate, the trained interviewer visits to collect some basic data (such as who lives in the household and how many vehicles are owned), and leaves a memory jogger for each household member to record their travel. Once the travel days have been completed, the interviewer returns to discuss the results with the household. Participants use the memory jogger to recall their travel, and the interviewer probes for additional detail. Parents may answer on behalf of children under 10, and all other household members are interviewed in person.

Following the survey, the addresses visited and routes taken are mapped to calculate the distance travelled. This work is undertaken by Critchlow Ltd on behalf of the Ministry of Transport.

To date, walking distances have not been mapped. Throughout this report we have estimated walking distance from the time spent walking, using the conversion factor of 4.4 km/h. This has been determined by mapping a sample of walking trips in the 1997/98 survey (O'Fallon and Sullivan, 2004).

Travel by professional drivers (for example truck drivers, courier drivers and taxi drivers) in the course of their work has been excluded from the analyses. Personal travel by these people is included in the survey.

This method has been used for all three surveys, with some modifications to the sampling strata used.

* For more detailed information about the methodology, and to view the questionnaires used, visit the Ministry's website at www.transport.govt.nz/research/travelsurvey/

How New Zealanders travel

The Travel Survey collects information about how each leg of a journey is travelled. People in the survey report all their personal travel, including travelling in a vehicle, on foot, by bike and by public transport. We can use the surveys to track changes over time in the travel modes used.

The ongoing survey was designed to provide annual updates on a three-yearly moving average basis. We can examine trends by looking at the overlapping time periods July 2003 – June 2006, July 2004 – June 2007 and July 2005 – June 2008. These can be then be compared with results from the two earlier surveys.

The 1989/90 survey excluded children under five from the sample, so only people aged five and over have been included in these comparisons.

Travel distance

Travel has grown faster than the population. The New Zealand population increased by 10 percent between 1997/98 and 2005-08, while total household travel increased by 13.5 percent over this period.

Table 1 shows the distance travelled by mode per year. Overall, household travel distance increased by 18 percent between 1997/98 and 2003-06, an average increase of 2.4 percent per year.

Over the last two years, however, the household travel distance has dropped by 4 percent.



We're spending more time in the car. On average, New Zealand adults now spend four and three quarter hours a week driving, compared to less than four hours 20 years ago.

Photo courtesy of NZTA

Table 1: 100 million km travelled per year, by mode (road-based modes only, ages five and over)

TRAVEL MODE	1989/90	1997/98	2003-06	2004-07	2005-08
Car/van driver	183.2	251.6	300.9	300.9	299.0
Car/van passenger	115.5	132.9	154.1	150.6	147.4
Pedestrian	8.4	8.9	8.7	9.1	8.7
Cyclist	3.5	2.8	2.6	2.6	3.1
Bus	15.2	17.9	18.5	15.2	13.2
Motorcyclist	3.1	1.8	2.5	2.4	2.5
Total (includes 'other' household travel)	323.0	411.1	485.9	473.7	466.9
Mean percentage change per year (from previous survey)		3.0%	2.4%	-2.5%	-1.5%
Estimated people aged 5+ (for calculating distance per person)	3 056 701	3 428 173	3 797 356	3 853 333	3 902 243

Time spent travelling

New Zealanders' total travel time increased by 16 percent between 1989/90 and 1997/98, and by a further 15 percent between 1997/98 and 2003-06. The average increase per year is shown in Table 2 below. Since 2006, the total time spent travelling has levelled off.

Our time spent behind the wheel of a car increased by 30 percent between 1989/90 and 1997/98 and by a further 19 percent between 1997/98 and 2003-06. Since then, overall driving time has increased slightly, but at a lower rate than population growth.

New Zealanders of driving age (15 and over) now spend an average of four and three quarter hours driving each week, whereas 20 years ago we averaged less than four hours each week. Ten years ago we spent an average of four and a half hours driving each week.

Figure 1 shows the number of hours per week on average that we each spend travelling. Over the last 20 years our total travel time has remained fairly constant at about seven and a half hours per week, or just over an hour a day. However, the same period has seen a shift towards more time in the car and less time spent walking and cycling.

Figure 1: Weekly time spent travelling per person (ages five and over)

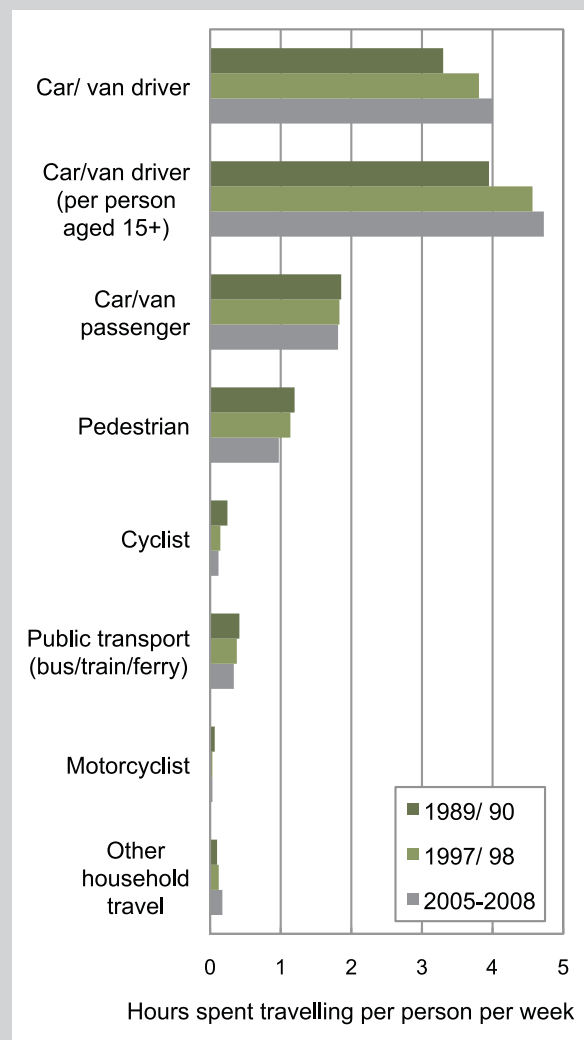


Table 2: Million hours per year spent travelling by mode (ages five and over)

TRAVEL MODE	1989/90	1997/98	2003-06	2004-07	2005-08
Car/van driver	526	681	808	812	815
Car/van passenger	296	327	377	373	369
Pedestrian	191	203	198	206	198
Cyclist	39	26	22	22	24
Public Transport (bus/ train/ ferry)	66	68	83	75	68
Motorcyclist	10	6	9	6	7
Total (includes 'other' household travel)	1144	1333	1539	1527	1517
Mean percentage change per year (from previous survey)		1.9%	2.1%	-0.8%	-0.7%

Age group travel patterns

How much people travel in their daily lives is influenced by their age and stage in life. People of working age travel more than younger people and retired people. People aged between 35-54, an age when people often have jobs and teenage children, travel the greatest distance. Driving accounts for three quarters of the distance travelled by people aged between 25-64, with travel as a car passenger making up most of the remainder.

Those aged under 25 have less access to vehicles of their own and, as Figure 2 shows, are much more reliant on being driven, walking or public transport. Young adults in the 15-24 year age group spend more time walking than any other group. Children under five travel a surprising distance as car passengers – almost 9,000 km on average each year. The average pre-schooler spends four and a half hours per week in the car (Figure 3).

Travel decreases to less than 6,000 km per year only amongst people aged over 75. This group does a similar amount of walking to younger groups, but their driving time and distance is half that of people aged 65-74.

School aged children and young adults are the biggest users of public transport. Even among this group, the average time spent on public transport is only 30-45 minutes each per week.



On average, New Zealanders in their late thirties, forties and early fifties spend nearly nine hours a week travelling.

Figure 2: Distance travelled per person, per year, by age group (2004-2008)

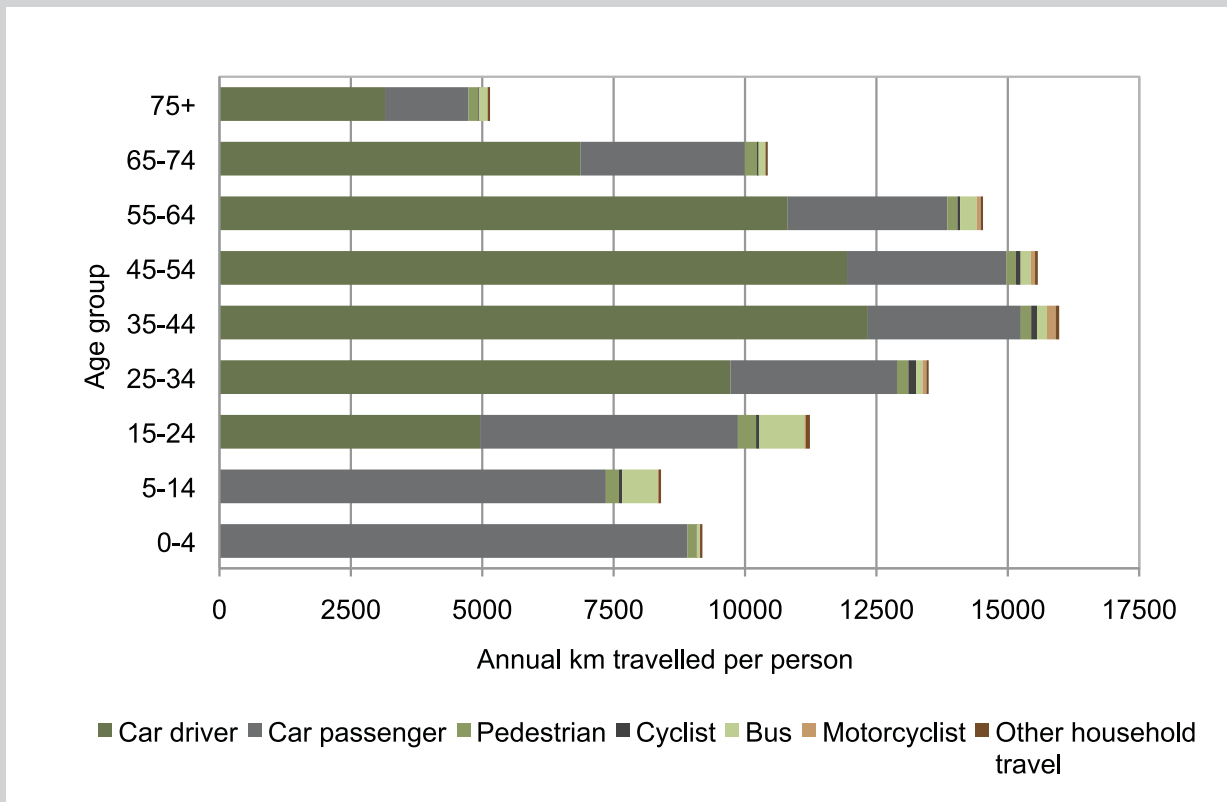
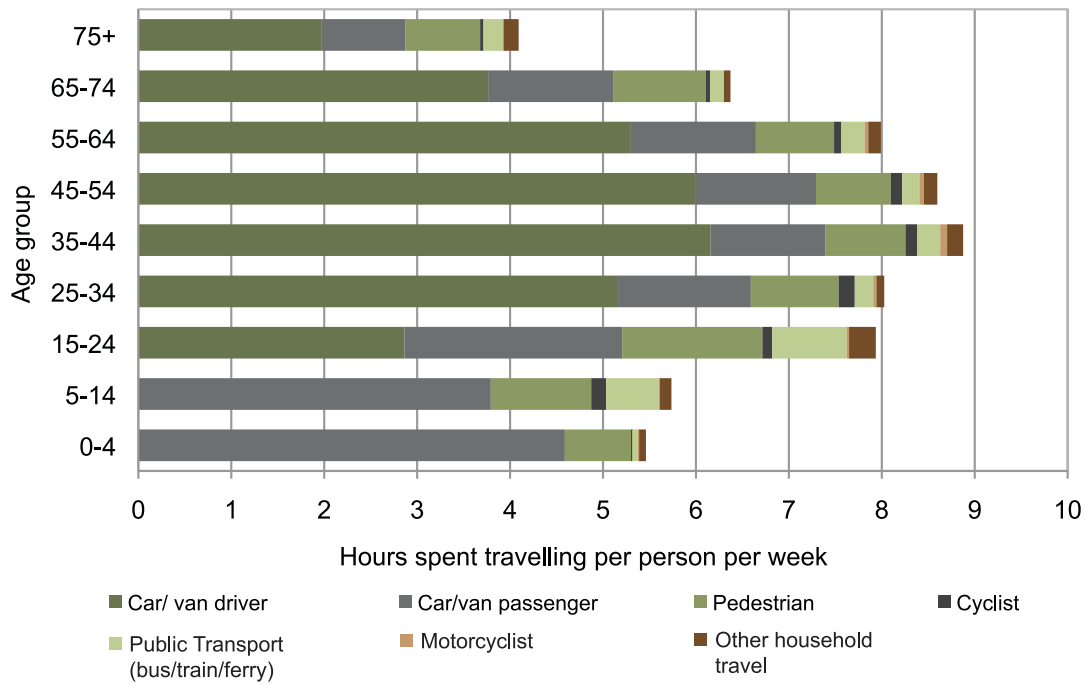


Figure 3: Weekly time spent travelling, by age group (2004-2008)



Regional travel

Regional travel patterns can be explored by pooling four years' data from the current survey. Looking at the time and distance travelled per person allows us to compare the travel patterns of people living in different regions.

Figure 4 and Figure 5 show the distance and time spent travelling per person for each region, using data collected between July 2004 and June 2008. These figures refer to travel by people living in the region, regardless of where they travelled to.

Regional analyses of several transport indicators are available on the *Transport Monitoring Indicator Framework (TMIF)*, available on the Ministry website at www.transport.govt.nz/ourwork/transportmonitoring/. The TMIF provides a framework for the monitoring of the New Zealand transport system.

Tables of total distance and time spent travelling for each region are available on the Ministry website at www.transport.govt.nz/research/latestresults/.

Figure 4 shows the annual distance travelled per person in each region (Nelson/Marlborough/Tasman have been combined to ensure a large enough sample for analysis). Bus travel includes both urban and long-distance bus services, and features in most regions.

Over the period studied, Waikato residents reported the most driving and the most travel overall, averaging 14,500 km annually. Gisborne residents reported the least travel (less than 10,000 km per year).

As Figure 5 shows, people living in the most urbanised regions spent the most time travelling. People living in the Auckland and Wellington regions spent eight hours on average travelling each week. Aucklanders averaged more than four hours a week driving and another two travelling as car passengers.

Wellington region residents reported the most time spent walking, while people in Gisborne, Canterbury and Nelson/Marlborough/Tasman recorded the most cycling.



People living in Waikato travelled the greatest distance, but Auckland and Wellington region residents spent the most time travelling.

Photo courtesy of NZTA

Figure 4: Distance travelled per person, by region of residence (2004-2008)

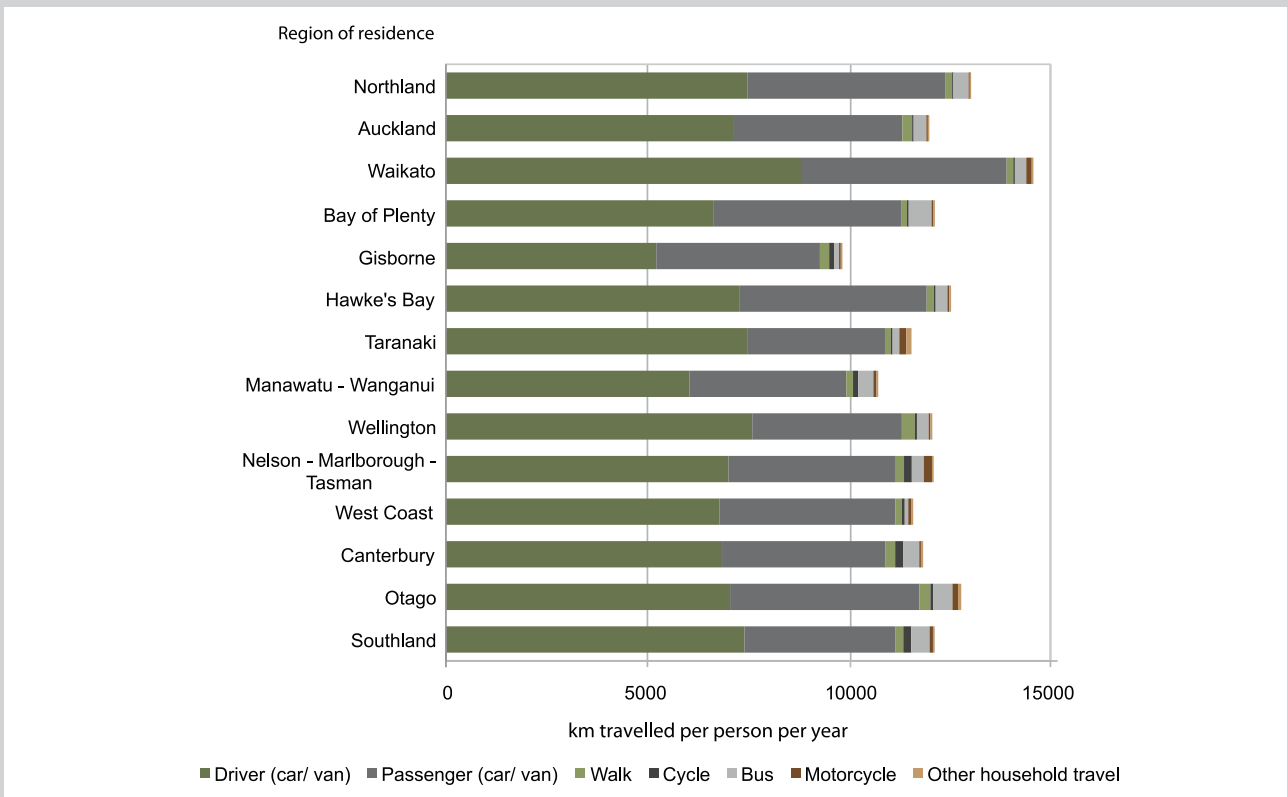
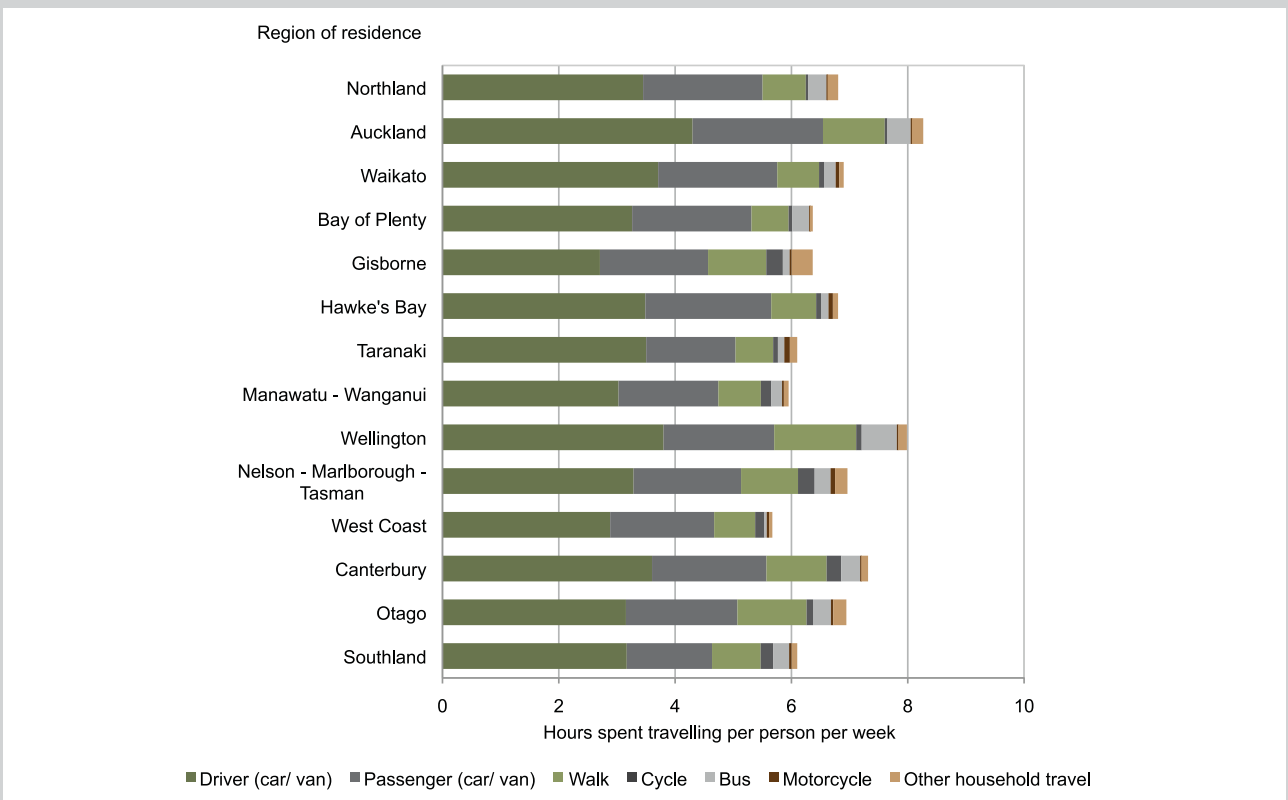


Figure 5: Weekly time spent travelling per person, by region of residence (2004-2008)



Regional trends

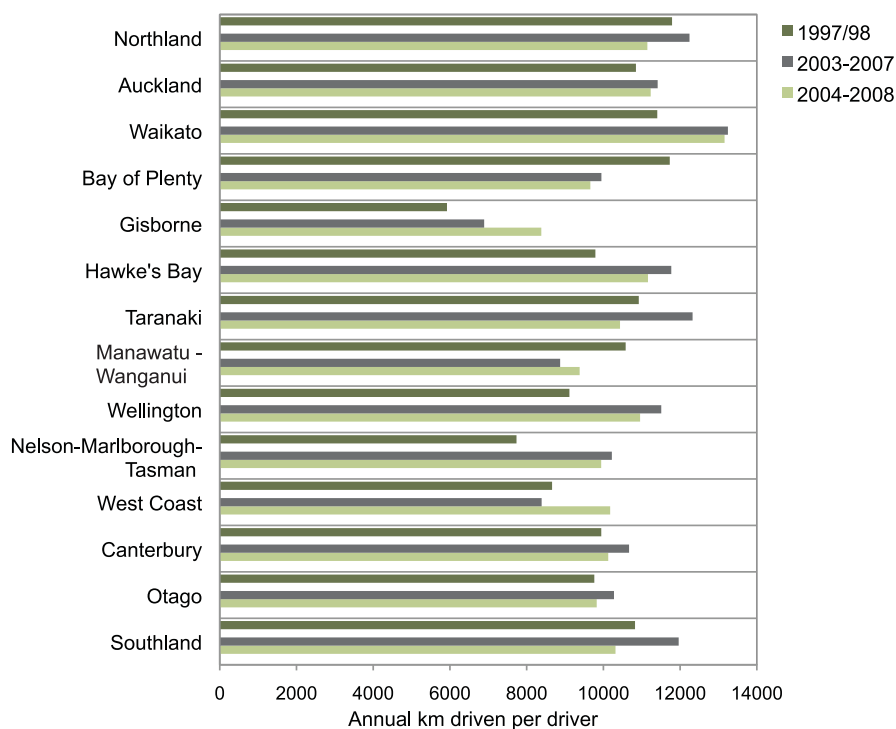
Regional analyses are available from the 1997/98 and current surveys. The graphs below and opposite show the 1997/98 results, together with the two most recent survey periods. In general, regional travel patterns are similar to the national ones, with an increase in driving both overall and per person, and a decrease in the amount of time each person spends walking.

The per-person increase in driving over the last decade has been most marked in the Wellington, Gisborne and Nelson/Marlborough/Tasman regions (Figure 6).

The total distance driven by Auckland residents has increased by 22 percent, but this is due to population growth rather than by individuals driving further. The reported household distance driven by Bay of Plenty residents has decreased over the last decade.

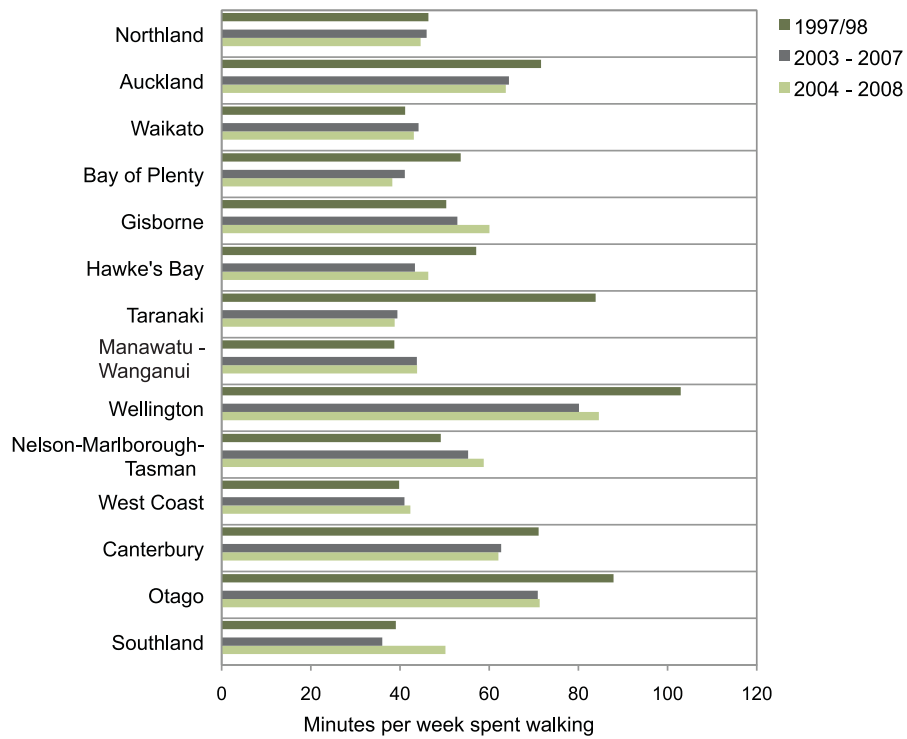
People in most regions reported less walking in recent years than during the late 1990s (Figure 7). In Gisborne, Manawatu-Wanganui, Nelson/Marlborough/Tasman and Southland, the average walking time per week has remained steady or even increased over the last decade.

Figure 6: Annual distance driven per driver*, by region of residence



* "Driver" is defined as someone who reported driving at least 100km in the previous year. Please note that this graph visually compresses the time interval between 1997/98 and 2003-07.

Figure 7: Weekly time spent walking* per person



* Excludes bush walking and walking on private property (eg farms, shopping malls).
Please note that this graph visually compresses the time interval between 1997/98 and 2003-07.

Reason for travel

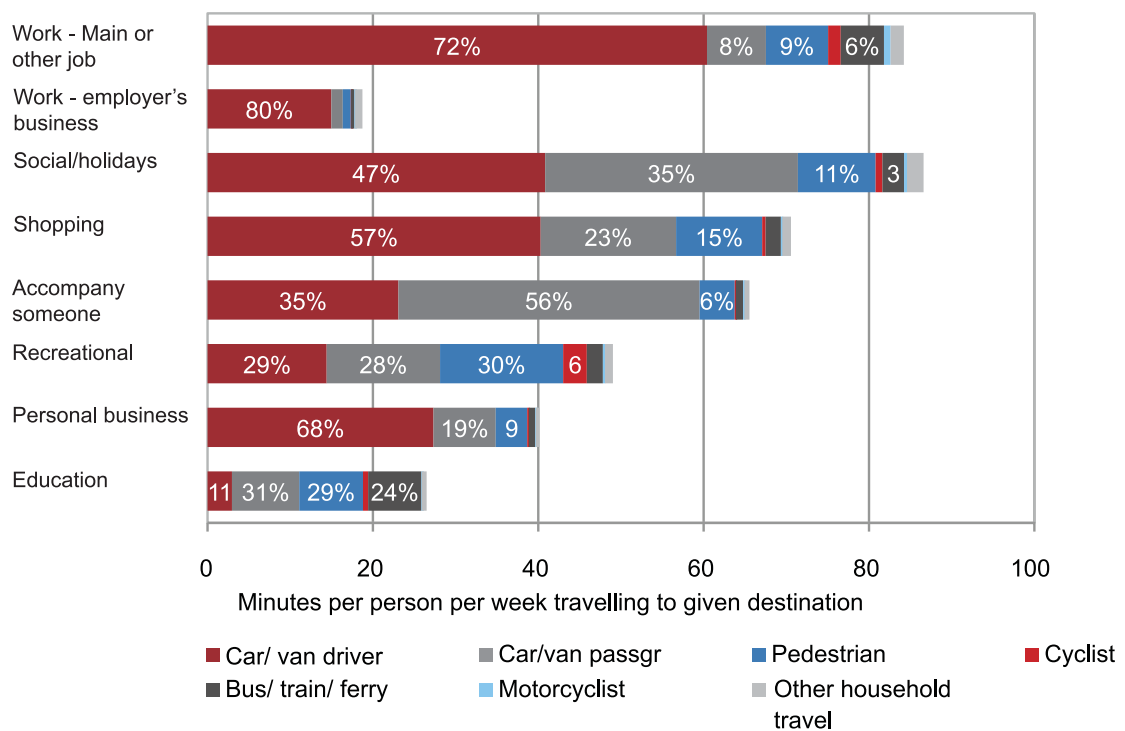
During the personal interview, survey respondents were asked about the purpose or destination of each trip leg they made. The trip purposes were broadly classified as going to work (full or part time), work-related trip (employer's business), education, shopping, personal business, social, returning home or to accompany someone else (for example, a parent taking a child to school).

For these analyses, time spent returning home has been apportioned to the other trip purposes. Trip legs to change to another mode of transport (eg walking to the bus stop) have been classified to the ultimate purpose of the travel.

Travel to or for work is the largest travel category and the most dependent on driving. Figure 8 shows the amount of time spent travelling for each purpose, along with the percentage of that purpose's travel time carried out by each mode. (Percentages along each bar add to 100 percent, but only the larger modes are labelled).

Seventy-two percent of the time and 84 percent of the distance travelled to work is as a car or van driver. A later section examines the changes in how people travel to work over the last 20 years.

Figure 8: Why and how people travel - mode share of time spent travelling (2004-2008)



Travel to social destinations is the second most common reason for travel, in terms of both time and distance. This includes visiting friends and family, entertainment, religious meetings and other hobby-related pastimes. It also includes going on holiday. Though driving is still the main mode of transport to social occasions (54 percent of distance travelled), travelling as a car or van passenger accounts for a far greater share of the travel than for work trips (41 percent). This reflects the 'whole family' nature of many of these activities (Table 3).

Shopping trips and those for personal business (eg banking, doctor's visits and other 'must dos' that don't involve buying a product) are also highly car-reliant.

The 'accompany someone' category includes any trip leg where the primary purpose belonged to another person. It could include parents accompanying or transporting children to school or sports, giving a friend a ride to the doctor's, or walking to school to meet a child at 3pm. It also includes 'just going for the ride' on someone else's trip purpose, particularly where children accompany a parent on their errands. This category is dominated by car passenger rather than driver travel.

Accompanying or transporting someone makes up one eighth (12 percent) of the total driving distance.

'Recreational' includes going for a walk/ride/drive as well as travelling to participate in sporting events. Five percent of the distance travelled for recreation or to sporting destinations, and 30 percent of the time spent travelling, was covered on foot.



The average adult spends one and a half hours per week travelling to the shops and back.

Table 3: How people travel to different destinations - mode share of distance (2004-2008)

	Car/ van driver	Car/van passenger	Pedestrian	Cyclist	Bus/ train/ ferry	Total (incl motorcyclist and other)
Work – main or other job	84%	10%	1%	1%	3%	100%
Work – employer's business	88%	9%	1%	0%	1%	100%
Social visits / holidays	54%	41%	1%	0%	2%	100%
Shopping	66%	30%	2%	0%	1%	100%
Accompany or transport someone else	36%	63%	1%	0%	1%	100%
Recreational	42%	45%	5%	2%	5%	100%
Personal business	73%	24%	1%	0%	1%	100%
Education	19%	47%	7%	1%	25%	100%

Travel purpose by age group

Figure 9 opposite shows travel destination types by age group. Many patterns are predictable – education features prominently among the 5-24 age group, while work accounts for nearly one third of travel time among 25-64 year olds. What is more interesting is how much travel time is not work-related. Pre-schoolers spend nearly four hours a week accompanying other people (presumably parents) on their errands, while school age children spend two hours a week doing this. The average adult spends between an hour and a half and two hours each week travelling to 'social' destinations. This includes entertainment destinations, religious activities and voluntary work, as well as visiting friends. Travel to shops and for personal business accounts for another two hours a week for adults.

Travel to work

The Travel Survey allows us to look at travel to work and school during the morning rush hour. Over the last 20 years there has been a shift away from walking and car-sharing towards driving to work.

Table 4 and Figure 10 show how New Zealanders travelled to their main jobs between 6 am and 9.30 am on weekdays, and how this has changed.

Table 4 and Figure 10 show the number of *journeys* from home to work, whereas the tables in the section *Reason for travel* are based on total distance and time spent travelling.

More people now drive themselves all or most of the way to work – 79 percent in the most recent period, compared to 69 percent in the late 1980s. Car-sharing and public transport use has decreased over the last 20 years.



Eight out of ten of New Zealanders drive to work.

Table 4: Travel from home to work on weekday mornings (6 - 9.30 am)

	1989/90	1997/98	2003 - 2007	2004 - 2008
Full time workers in sample	2964	4509	5069	5084
	Percentage of journeys to work			
Drive	66%	70%	77%	76%
Drive and walk	3%	4%	3%	3%
Passenger (in private vehicle)	12%	9%	7%	7%
Passenger and walk	2%	2%	1%	0%
Walk only	6%	6%	4%	4%
Public transport and walk or public transport	7%	4%	5%	5%
Cycle	4%	3%	2%	2%
Walk and car and public transport	1%	1%	1%	1%
Other	1%	1%	1%	1%
TOTAL	100%	100%	100%	100%

Figure 9: Reason for travel, by age group (2004-2008)

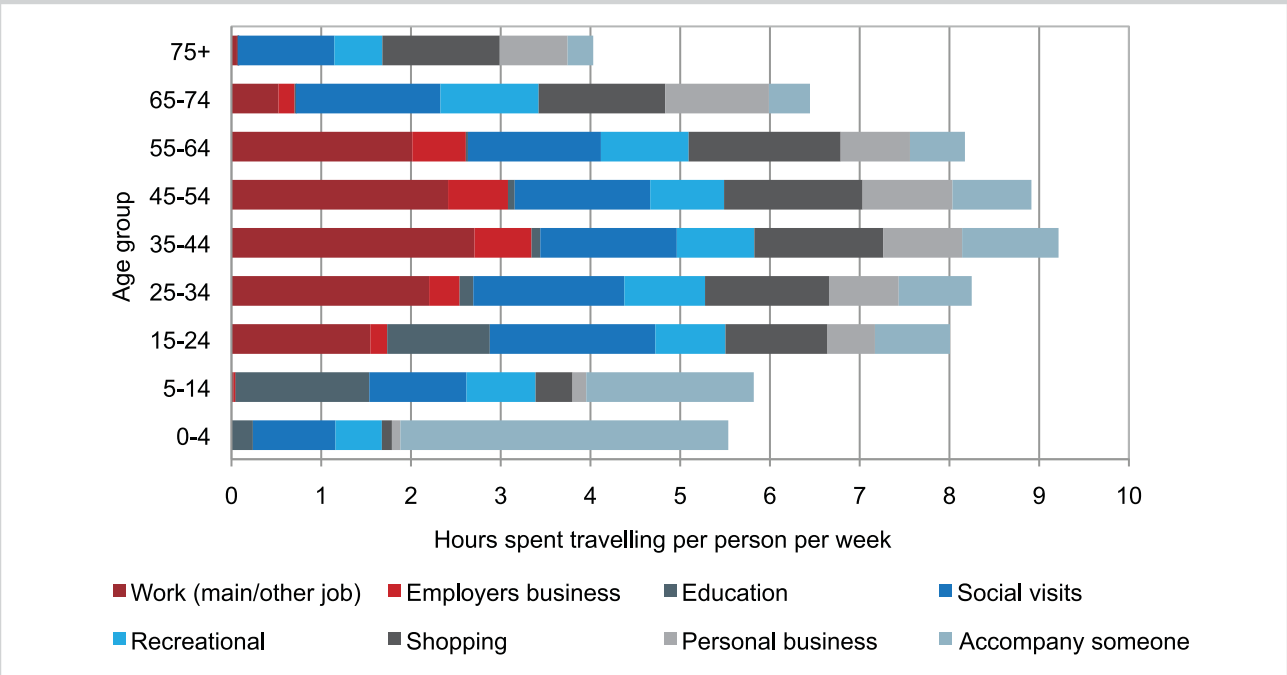
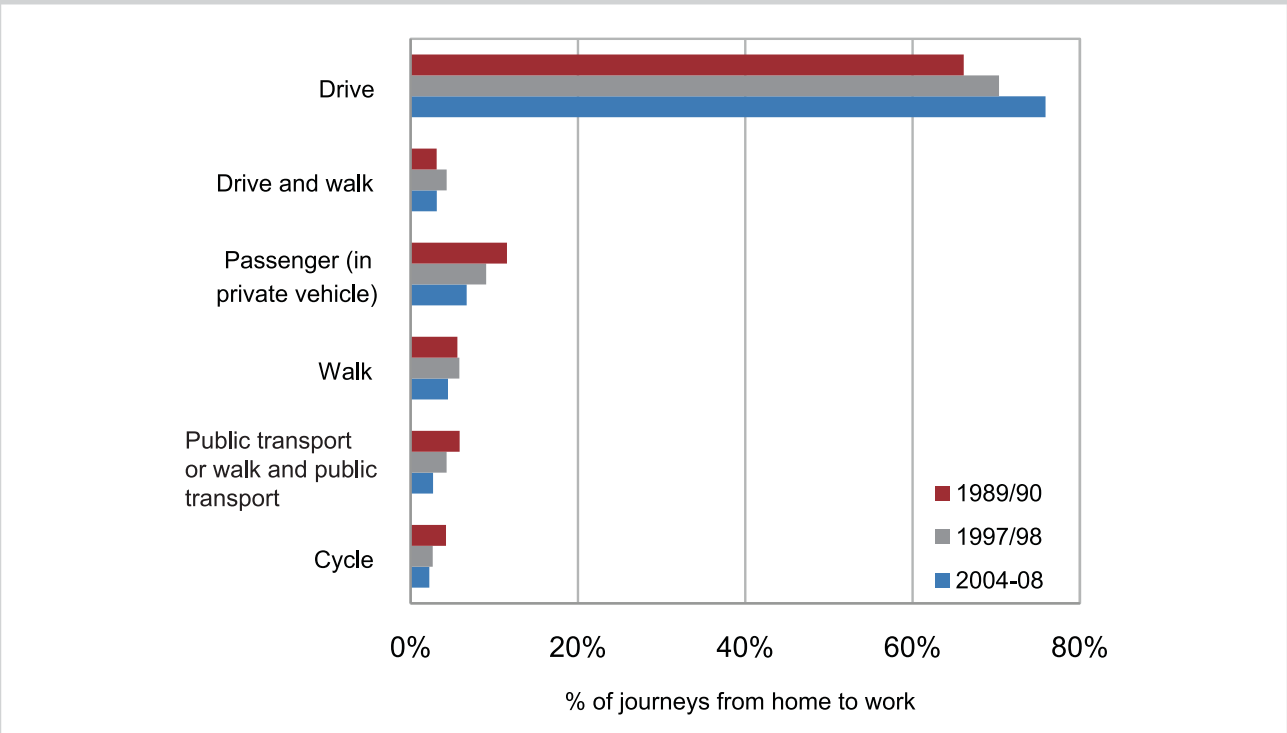


Figure 10: Travel from home to work on weekday mornings



Travel to school

Travel to school makes up only six percent of total travel, but the health implications for children and the timing of school travel within the congested morning peak make it a topic of interest.

Table 5 shows how primary and intermediate school age students have travelled from home to school over the last 20 years.

In 1989, more than 40 percent of primary school children walked to school, while one third were driven and 12 percent (one in eight) rode a bike. Both cycling and walking declined over the following decade. By the most recent period (2004-2008), more than half of school travel was by car, with one quarter travelling on foot and four percent by bike.

Similar trends have been seen among secondary school-aged students (Table 6 and Figure 12). More than a third (35 percent) are now driven to school, compared to only one fifth (20 percent) in 1989/90. However, this proportion hasn't increased much in the last ten years.

There has been a sharp decline in the number of students cycling to school. Only one student in 20 (5 percent) now rides to school, compared to one in nine (11 percent) ten years ago and one in five (19 percent) in 1989/90.

Bus travel has also decreased over this period. Walking decreased in the late 90s but has increased again, possibly because some students may have transferred from cycling to walking.



In 1989/90 more than half of our primary school children walked or cycled to school, but now less than one third do.

Table 5: Primary school children - travel from home to school

AGES 5-12				
	1989/90	1997/98	2003 - 2007	2004 - 2008
People in sample	1 027	1 991	1 610	1 635
	Percentage of journeys to school			
Walk (only)	42%	30%	26%	25%
Passenger (only)	31%	45%	55%	56%
Bicycle	12%	7%	5%	4%
Bus (only)	7%	7%	6%	5%
Walk and bus	4%	6%	4%	7%
Passenger and bus	2%	2%	2%	2%
Walk and passenger	1%	2%	1%	1%
Other	1%	1%	1%	1%
TOTAL	100%	100%	100%	100%

Table 6: Secondary school age - travel from home to school

Ages 13-17				
	1989/90	1997/98	2003 - 2007	2004 - 2008
People in sample	612	918	881	921
	Percentage of journeys to school			
Walk	26%	19%	27%	26%
Passenger	20%	32%	33%	35%
Bicycle	19%	11%	5%	5%
Bus	9%	7%	6%	5%
Driver	4%	7%	5%	4%
Bus & walk	18%	16%	14%	16%
Passenger & Bus	2%	2%	3%	2%
Walk & Passenger	1%	3%	2%	2%
Other	2%	4%	5%	5%
TOTAL	100%	100%	100%	100%

Figure 11: Travel to school by children (aged 5-12)

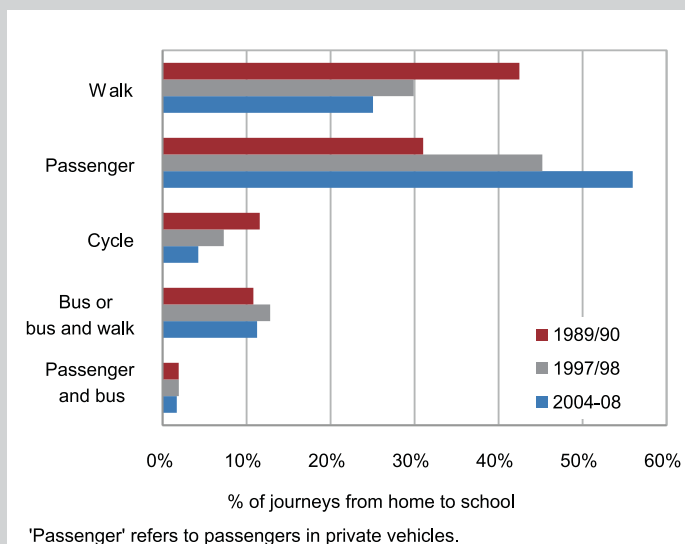
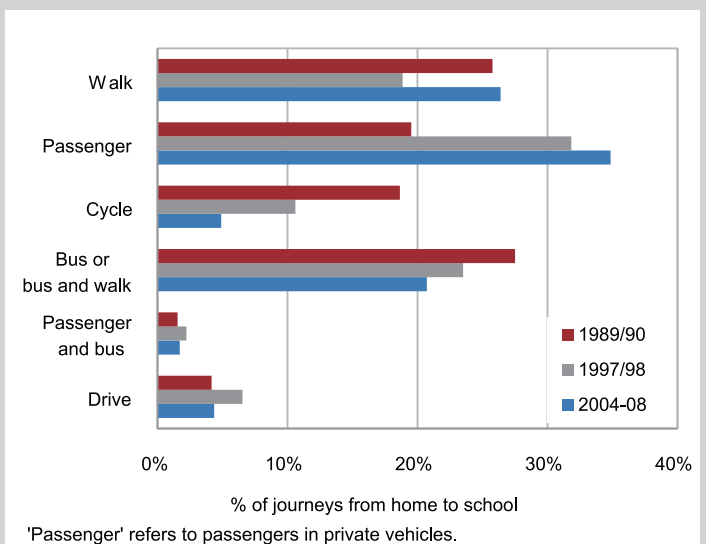


Figure 12: Travel to school by secondary school students (aged 13-17)



Driver travel

Driving is the mode of travel most used by New Zealanders. It accounts for half of all reported travel time, and two thirds of all travel time for people aged between 25 and 70. This section focuses on drivers of cars, vans, utes and sports utility vehicles (SUVs).

The youngest adults (aged 15-24) spend more time than other groups as passengers, walking and using public transport, but driving still makes up well over one third of this group's travel time.

Table 7 and Table 8 show the total distance driven and time spent driving in cars, vans, utes and SUVs each year. The increase over the last two decades was most marked among the 45-64 age group. This is a result of both changes in the driving population (more drivers in this age group) and an increase in the distance per driver in this group.

Figure 13 shows the average distance driven per driver in each group. The amount of driving done by drivers aged under 45 has changed little over the last decade, while drivers in the 45-74 age group have increased their driving by between 10 and 30 percent. This change is evident for both male and female drivers.



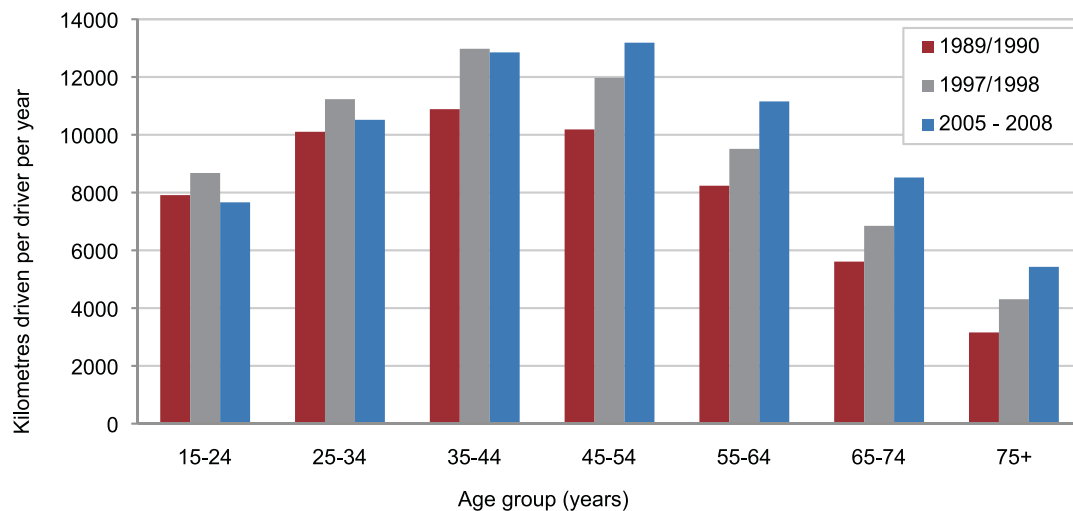
New Zealand adults spend two thirds of their travel time driving.

Table 7: Total distance driven, by age group

Age group	100 million km per year				
	1989/1990	1997/1998	2003-06	2004-07	2005-08
15-24	28.3	32.7	32.0	29.4	30.7
25-34	48.8	57.4	56.4	53.7	50.8
35-44	46.0	69.2	77.9	78.8	75.3
45-54	29.6	49.3	63.9	68.0	69.9
55-64	20.3	24.4	47.5	46.5	44.1
65-74	8.6	14.1	17.4	17.8	20.1
75+	1.7	4.4	5.8	7.0	8.3
TOTAL	183.2	251.6	300.9	301.2	299.3

Table 8: Total time spent driving, by age group

Age group	Million hours per year				
	1989/1990	1997/1998	2003-06	2004-07	2005-08
15-24	81	92	94	90	93
25-34	132	149	154	148	144
35-44	129	178	201	204	200
45-54	89	136	166	174	183
55-64	60	68	121	119	113
65-74	27	40	52	53	56
75+	8	16	20	24	26
TOTAL	525	680	808	812	815

Figure 13: Distance driven per driver* (cars, vans, utes and SUVs)

* A "driver" is defined as someone who reported driving at least 100 km during the previous year.

Driving experience

In addition to asking about travel on two specific days, we also asked people to estimate (within broad categories) how far they had driven in their lifetime. The graphs on these pages show lifetime driving experience for males and females, and how these profiles have changed over the last 20 years.

Figure 14 and Figure 15 show snapshots of lifetime driving experience by current age for women and men in 1989/1990 and in 2005–2008. There has been an increase in the amount of driving experience reported by people over the age of 20. A much higher proportion of drivers now report having driven more than 200,000 km in their lifetime so far.

The change over the last 20 years is particularly marked for women. Women over the age of 20 are now far more likely to have ever driven, and to have accrued more driving experience, than women of the same ages in 1989/90. This is especially noticeable among the over-65s. In the late 1980s, nearly one third (32 percent) of women aged 65 and over had never driven. By 1997/98 this had dropped to one in five (21 percent), and by the mid 2000s to 13 percent. More than half the women in this age group now say they've driven at least 200,000 km in their lifetime, compared to just under a third of women 20 years ago.



Both men and women have more driving experience than they did 20 years ago.

Photo courtesy of NZTA

Figure 14: Females: Lifetime driving experiences by current age group

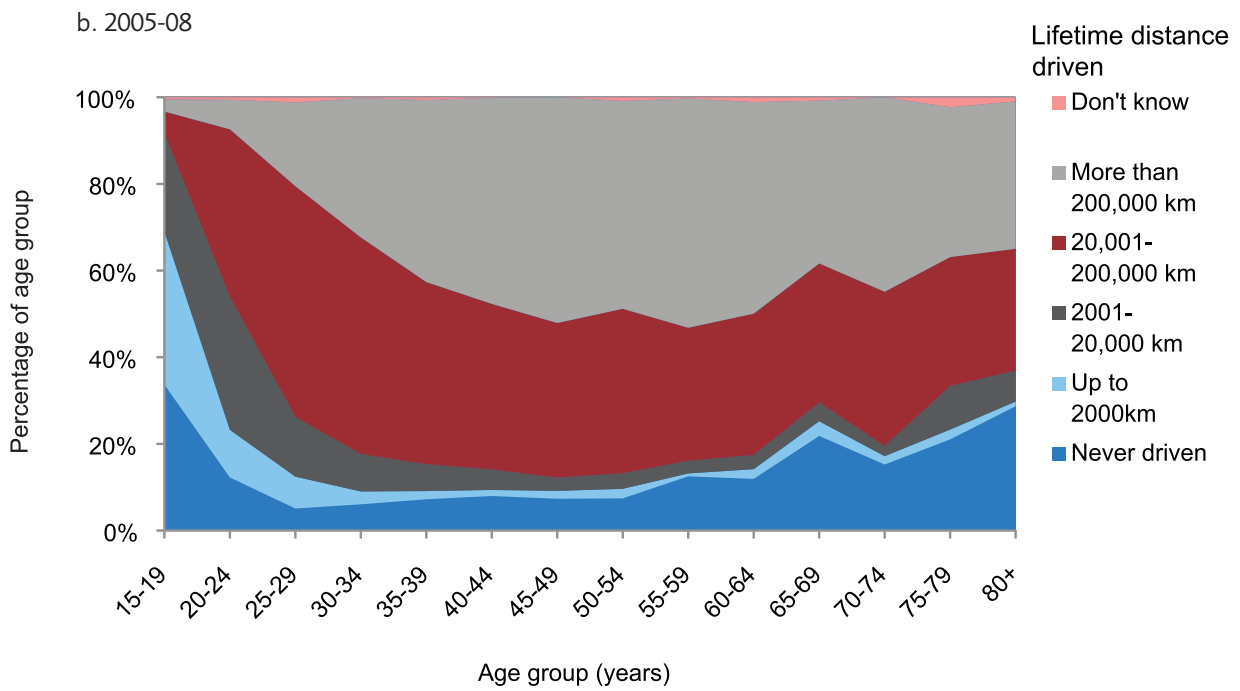
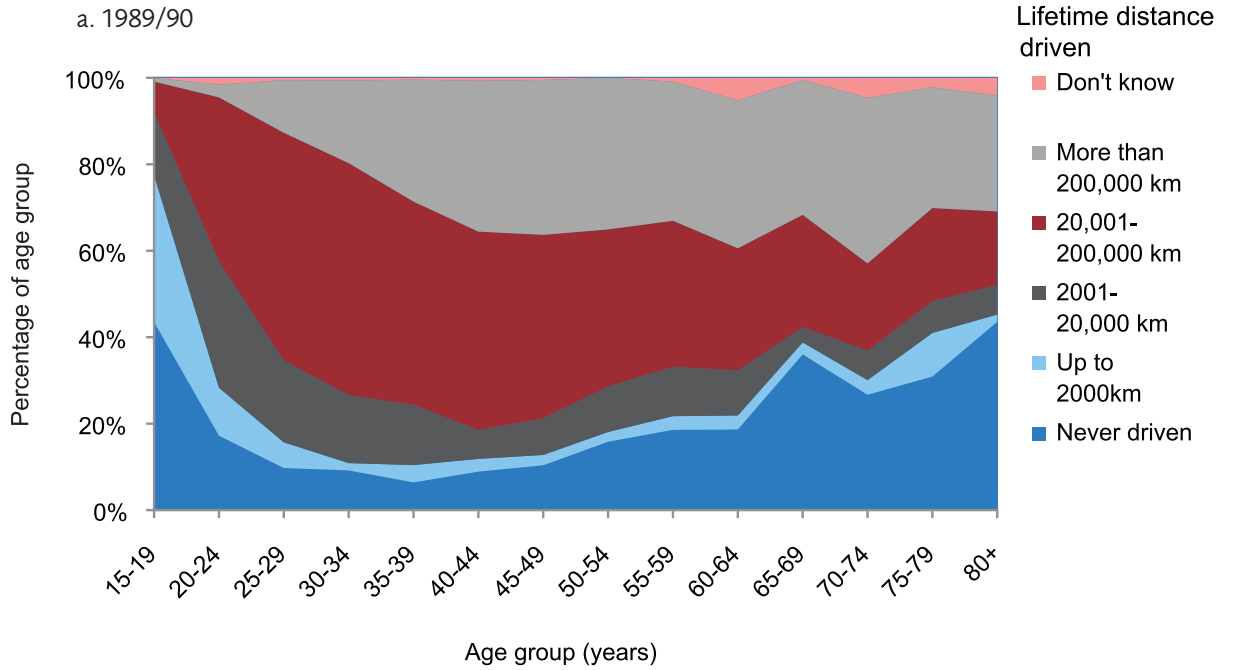
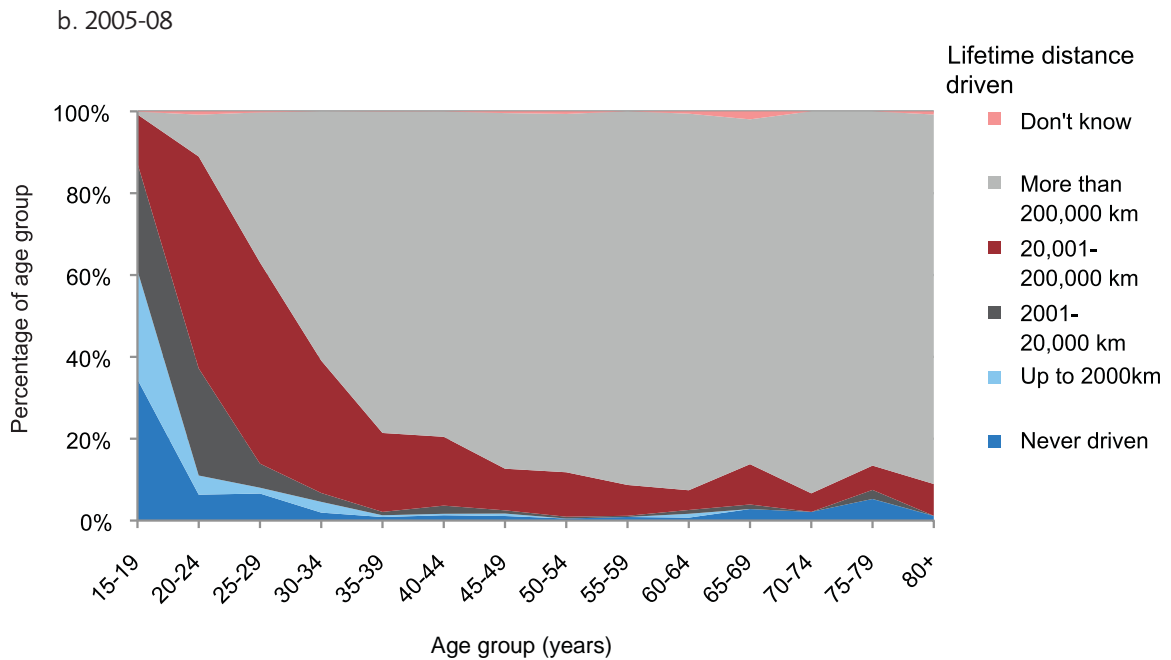
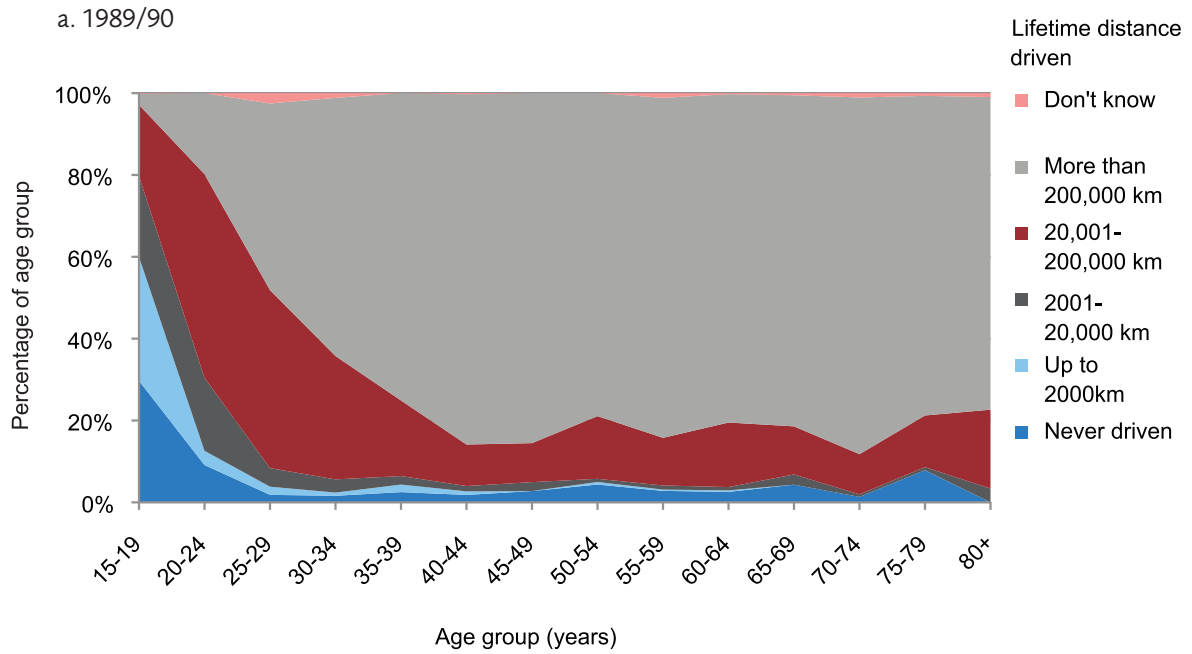


Figure 15: Males: Lifetime driving experiences by current age group



Travel as a car passenger

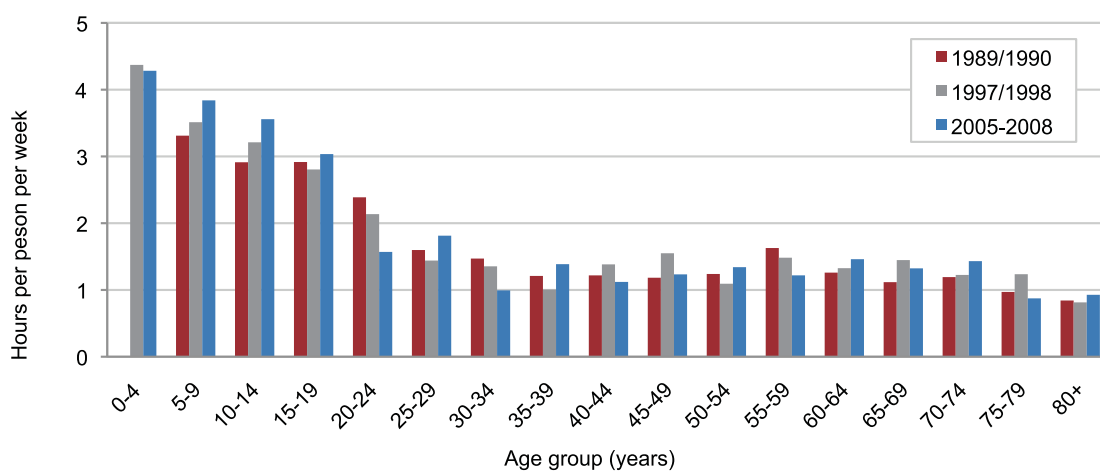
Although time spent driving has increased over the last 20 years, there hasn't been much change in the amount of travel as a car passenger. This reflects the fact that individuals are spending more time travelling in total, rather than simply transferring from the passenger seat to driving their own car.

Children spend the most time as a car passenger, with the youngest spending the most time (more than four hours a week), decreasing as the children become more able to travel independently. Adults over the age of 25 spend one to one and a half hours travelling as a passenger each week. Women spend more time in the passenger seat than men do.



The average preschooler spends nearly four and a half hours per week in the car.

Figure 16: Time spent travelling as a car or van passenger (hours per person per week)



*Children aged 0-4 were not surveyed in 1989/90.

Walking

Walking is another form of transport which we use for travel and recreation. Nationally, walking makes up 13 percent of the total time spent travelling. On any given day, about 25 percent of people report some walking on New Zealand roads and/or footpaths. Most commonly when people do walk, they walk for 10-20 minutes a day. Women average about an hour per person per week walking, whereas men average a little over 50 minutes per person per week.

The Travel Survey captures walking on the road and footpath environment. Off-road activities such as tramping and walking around the farm or shopping centre are not included in these estimates.

Overall, we are walking less than we did in 1989/90 and 1997/98. The 1989/90 survey only surveyed those aged five years and over and found that in total, people walked approximately one hour and 12 minutes each per week. By 1997/1998, this had decreased slightly to one hour and eight minutes and is currently 58 minutes per week (2005–2008). When the under-five year olds are taken into account in the latter two surveys, walking by all ages has decreased from one hour and six minutes to 57 minutes per person per week between 1997/1998 and 2005–2008.

Looking in more detail by age group, the biggest change in the time per person spent walking has occurred in the 5-14 age group. Here it has decreased from about one and a half hours per person per week on average to about one hour per person per week. No consistent trend in the amount of time spent walking is visible across the other age groups (Table 9 and Figure 17).

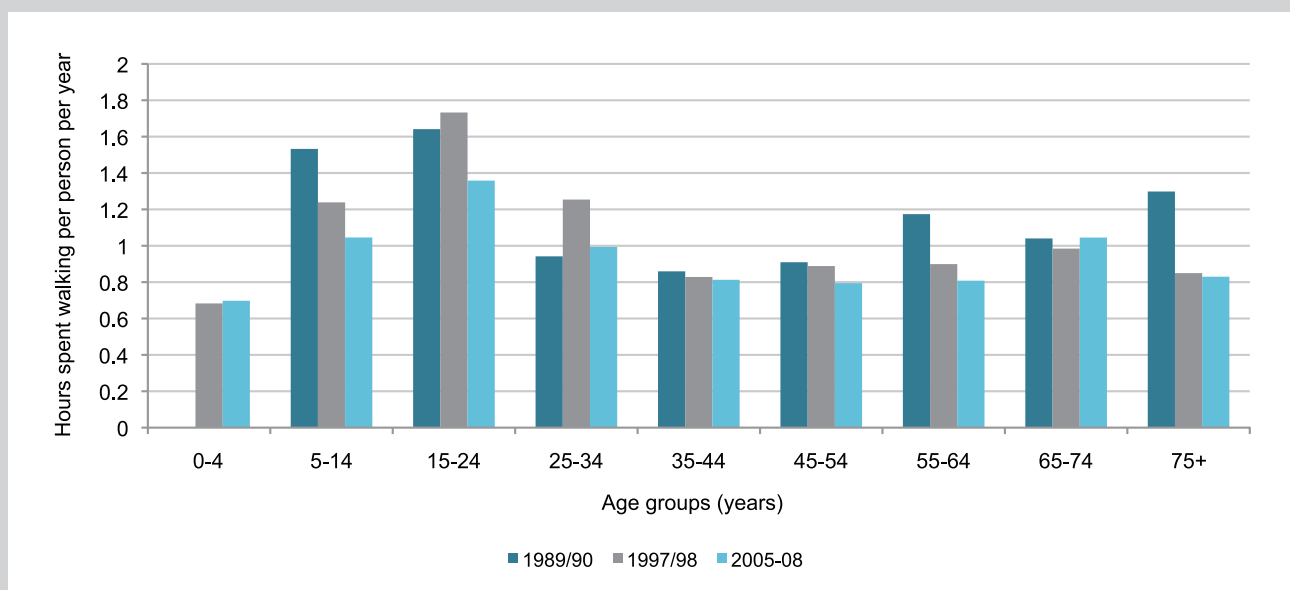


Children aged 5-14 years old now spend about an hour walking per week, compared to an hour and a half 20 years ago.

Table 9: Trends in hours spent walking each week per person by age group

	1989/90	1997/98	2005-08
Age group	Estimated time walking per week	Estimated time walking per week	Estimated time walking per week
0-4#	#	41 min	42 min
5-14	1 hour 32 min	1 hour 14 min	1 hour 3 min
15-24	1 hour 38 min	1 hour 44 min	1 hour 21 min
25-34	57 min	1 hour 15 min	1 hour
35-44	52 min	50 min	49 min
45-54	55 min	53 min	48 min
55-64	1 hour 10 min	54 min	48 min
65-74	1 hour 2 min	59 min	1 hour 3 min
75+	1 hour 18 min	51 min	50 min
TOTAL	#	1 hour 6 min	57 min
TOTAL 5 OR OVER	1 hour 12 min	1 hour 8 min	58 min

Children aged 0-4 were not surveyed in 1989/90.

Figure 17: Historical time series of time spent walking per person per week

Cycling

Cycling is a popular form of travel, both for transport and recreation, enjoyed by children and adults. 71 percent of households with children have one or more working bicycles, although the proportion of households with bicycles diminish as the occupants get older and the number of occupants decreases. As a nation we spend one percent of our time cycling on our roads and when we do cycle, we most often cycle for 20-30 minutes a day and travel about 1-3 km. In general, males spend more time cycling than females for all age groups.

This survey captures cycling on the road and footpath environment. Off-road activities such as mountain biking are not included in these estimates.

For children (under 18 years) there has been a reduction in both the time per person spent cycling and the distance cycled per person (Table 10 and Figure 18). The average time cycled per week for those aged 5-12 years has decreased from 28 minutes in 1989/90 to eight in 2005-2008. The average distance cycled has also decreased from 2.8 km in 1989/90 to 1.0 km in 2005-08.

For those aged 13-17, the time spent cycling per week has decreased from 52 minutes in 1989/90 to 12 minutes in 2005-08. The distance cycled per week has also decreased substantially from 7.9 km in 1989/90 to just 1.8 km in 2005-08. There has been no such reduction for adults.

Different age groups cycle for different reasons. Children 5-17 years old are most likely to be cycling to and from school or some form of educational activity (based on the time they spend cycling), whereas adults 18 years and over are most likely to be cycling for recreation.



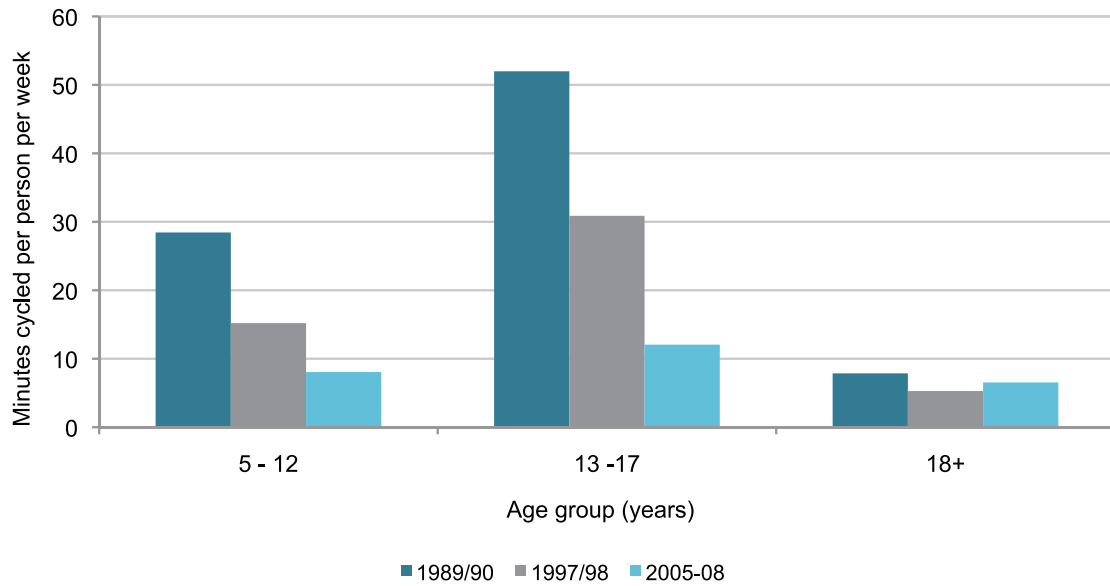
Children aged under 18 spend less time cycling and cycle for shorter distances now than they did in the late 1980s.

Table 10: Trends in time spent cycling and distances cycled per person per week, by age group

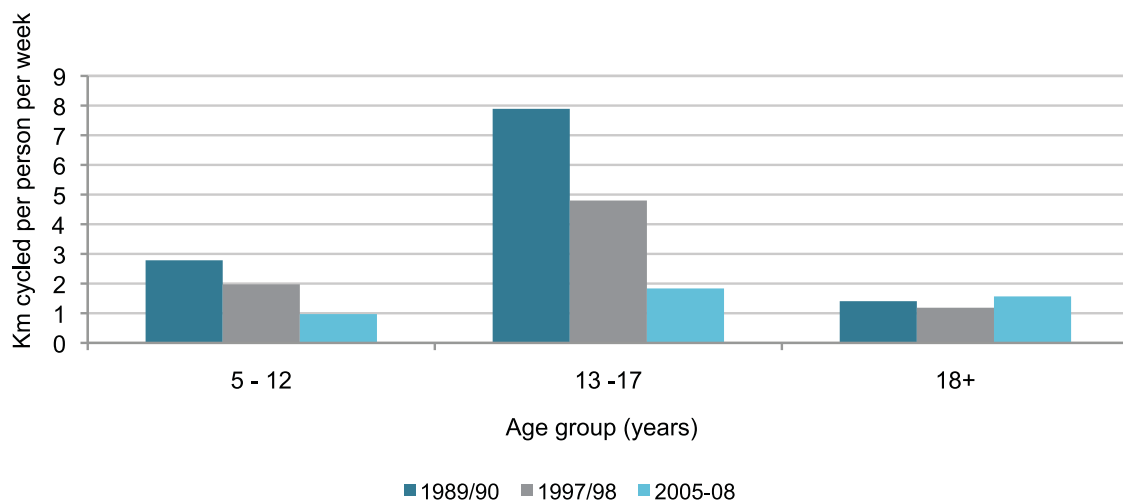
Age group	Estimated minutes cycling per person per week			Estimated km cycling per person per week		
	1989/1990	1997/1998	2005 - 2008	1989/1990	1997/1998	2005 - 2008
5-12	28	15	8	2.8	2.0	1.0
13-17	52	31	12	7.9	4.8	1.8
18+	8	5	7	1.4	1.2	1.6
TOTAL 5 OR OVER	15	9	7	2.2	1.6	1.5

Figure 18: Trends in time and distance spent cycling per week

a. Trends in time spent cycling per week by age group



b. Trends in distance cycled per person per week by age group



Risk

Road crash statistics by themselves don't necessarily tell us who is most at risk on the road because they don't take into account the time or distance travelled. The amount of travel can be combined with crash statistics to compare the risk of death and injury for different age groups or different modes of travel.

By merely considering the total number of crashes that drivers have, it could be concluded that drivers less than 15 years old are very safe on the road because there are very few crashes involving them. In fact, this is really a result of there being only a small number of this age group actually driving as it is illegal for them to be doing so.

In the following section, we make use of information about the amount of travel being done by various groups combined with crash statistics (Table 11) in order to see who is at greater or lesser risk given the amount of travel they do.

Risk can be expressed as road crashes or injuries occurring per km travelled or per hour of travel.

The crash information is taken from the Crash Analysis System (CAS). CAS holds information on police reported motor vehicle crashes, so the data presented here only deals with injury crashes involving motor vehicles. While this is fairly obvious for drivers and passengers, this does mean that cyclist risk is underestimated as crashes involving cyclists only or cyclists and pedestrians only are not included.



Motorcycling continues to be the riskiest mode of travel. For 2005–2008, motorcyclists are 17 times more likely to be killed or injured in motor vehicle crashes than car drivers per time spent travelling and distance driven.

Fragility

Risk of death or injury on New Zealand roads has several contributing factors which need to be thought about when looking at the statistics.

A factor which can increase or decrease the level of risk is the fragility of the road user. At either end of the age spectrum, road users are more fragile. They are killed or injured more easily for a given level of crash than those aged approximately 20-60 years old. This means that care should be taken in interpreting the risk curves by age, especially for older road users.

Fragility corrections have been calculated for driver deaths and can be applied under certain circumstances, but because the following risk curves involve deaths and injuries, such corrections have not been applied. For more information on fragility correction, please see Evans (2004), and the Ministry of Transport Risk fact sheet¹.

Table 11: Comparative deaths/injuries, distances and time spent travelling by mode

	Deaths/injuries per year			Distance travelled per year (100 million km)			Time spent travelling per year (million hours)		
	1989/90	1997/98	2003 -08	1989/90	1997/98	2003 -08	1989/90	1997/98	2003 -08
Motorcyclist	2386	1084	1039	3.1	1.8	2.4	10	6	8
Cyclist	1018	632	765	3.5	2.8	2.8	39	26	22
Car driver	7648	6410	8265	183.2	251.6	303.7	526	681	817
Car passenger	4152	3081	3141	115.5	132.9	153.8	296	327	376
Pedestrian	1146	927	979	8.4	8.9	8.7	191	203	198
Bus passenger	90	17	45	15.2	17.9	16.0	54	59	62

1. www.transport.govt.nz/research/latestresults/

Risk: all modes

We all want to know how safe particular modes of transport are compared to each other. For a given trip, is it safer to drive, take the bus or cycle? What are our chances of being involved in a crash on a motorcycle compared to a bicycle?

Initially we want to see how risky different modes of transport are by the time spent travelling by that mode and the distance travelled in that mode, and how these have changed over the past 20 years. To do this we focus on the most common modes for personal travel:

- driving a car (including a van, ute or SUV)
- being a passenger in a car
- walking (including skateboarding)
- cycling
- motorcycling (including scooters and mopeds)
- being a bus passenger

Figure 19 shows the number of people killed or injured in motor vehicle crashes per million hours spent travelling. This shows that motorcycling is the riskiest travel mode per time spent travelling, followed by cycling. Car drivers have a higher risk than passengers, and the two safest travel methods are walking and being a bus passenger.

While the size of risk has changed over time for some modes, the precedence of risk amongst the modes has not changed.

Figure 20 shows the number of people killed or injured in motor vehicle crashes per 100 million km travelled. The pattern is similar to the risk by time spent travelling.

The major difference is that cycling has a much larger risk by distance (10 times the risk of driving for 2003-2008), than by time (only three times larger than the risk by driving for 2003-2008). This relates to the relative speeds involved in the mode of travel, as cyclists travel much more slowly than cars and other motor vehicles, so will travel a much smaller distance in the same time. The same holds true for the pedestrians.

Figure 19: Deaths/injuries per million hours spent travelling, by mode

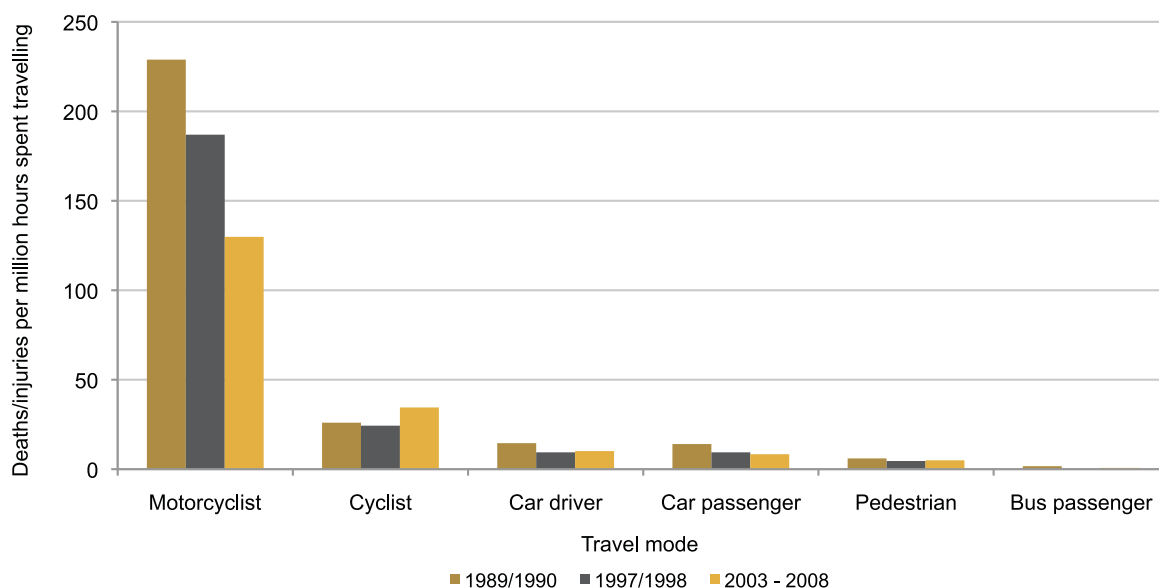
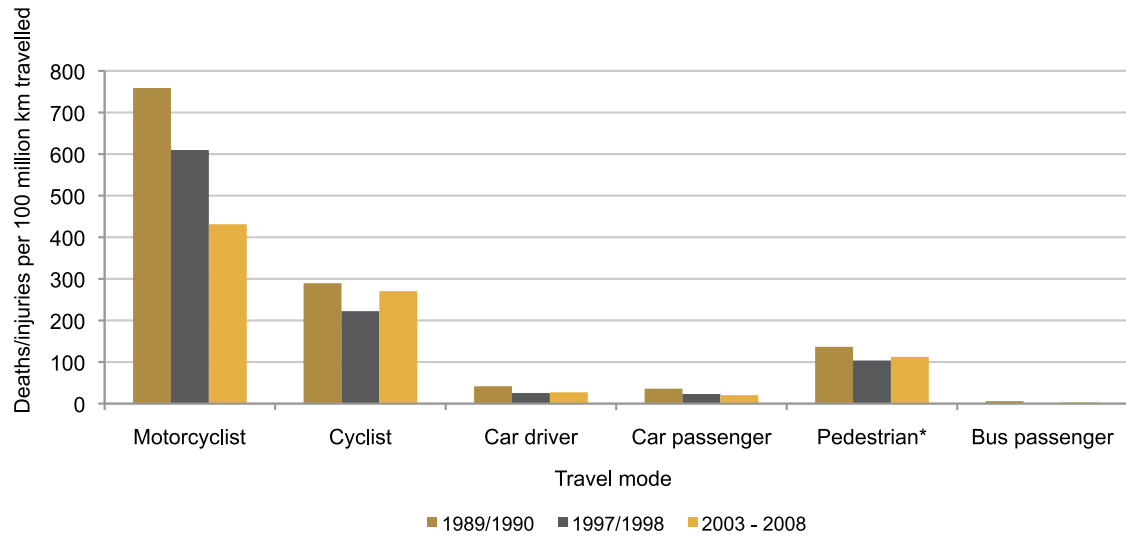


Figure 20: Deaths/injuries per 100 million km travelled, by mode

*Pedestrian risk per 100 million km travelled imputed from assumed walking speed of 4.4 km per hour from O'Fallon and Sullivan (2004).

A snapshot of driver risk

We already know that driving cars and vans is a major form of transport, making up half the total time spent travelling per year. We also know that as a mode, the risk of death or injury is less than for motorcycling or bicycling, but more than walking. But how do drivers of different ages and genders compare? Are women drivers less likely to be involved in fatal or injury crashes than men? Does driver age make a difference?

For the purposes of this section, unless stated otherwise, we are concerned with car drivers (including utes, vans and SUVs).

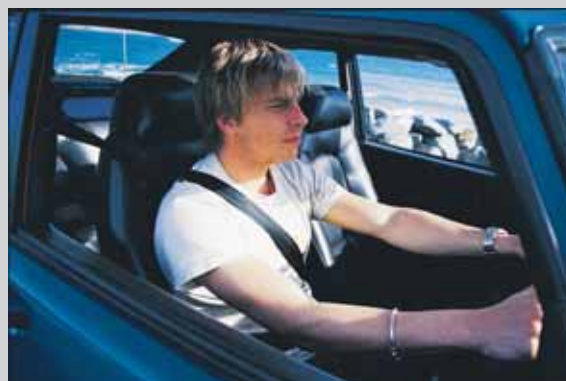
Our focus is on the risk of the driver being involved in a crash as opposed to the number of drivers killed or injured in crashes. A driver may be involved in a crash, but may not necessarily be killed or injured.

Figure 21, top panel, shows the breakdown by age and gender of the drivers involved in fatal or injury crashes. Male drivers are involved in larger numbers of fatal or injury crashes than female drivers for all age groups, and there is a sharp jump in the number of drivers involved in the 15-24 year age groups for both males and females compared to older drivers.

A similar gender division is visible in the distance driven (Figure 21, middle panel), with male drivers driving further in total than female drivers for all age groups.

The resulting risk curve (Figure 21, bottom panel) indicates that male drivers are more likely to be involved in fatal or injury crashes per distance driven in the younger age groups (15-29 years old), but that the risk experienced is quite similar for most older ages.

The highest risk age group is those 15-19 years old. While the risk appears to be higher for older drivers (75+ years old), it should be noted that some of this may be due to the fragility of the drivers involved. Unfortunately a fragility correction cannot be applied for driver involvement.

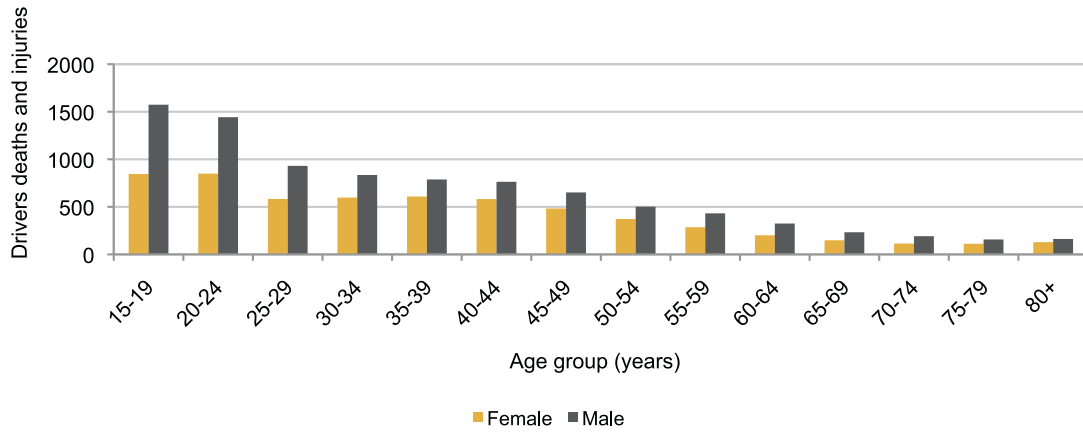


Young drivers aged between 15-19 years old are most likely to be involved in fatal or injury crashes per distance driven.

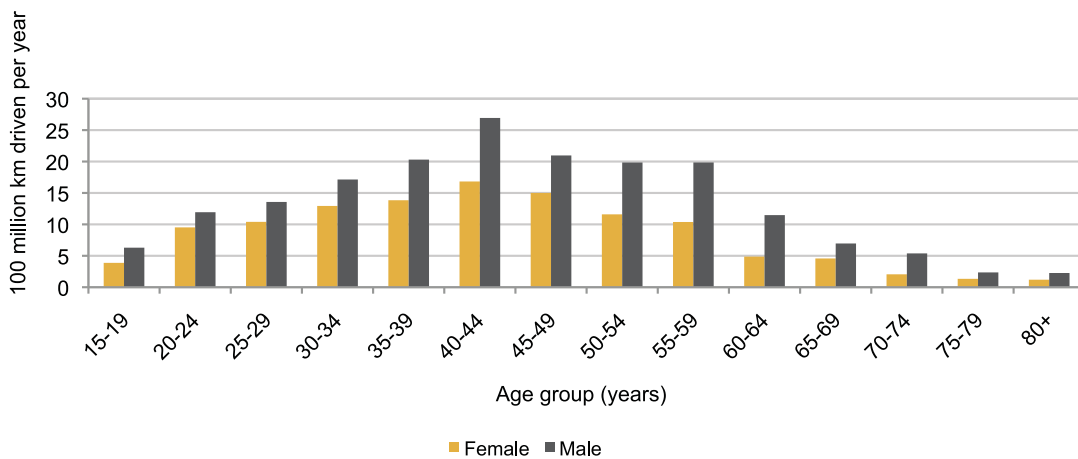
Photo courtesy of NZTA

Figure 21: Drivers involved in fatal or injury motor vehicle crashes per year

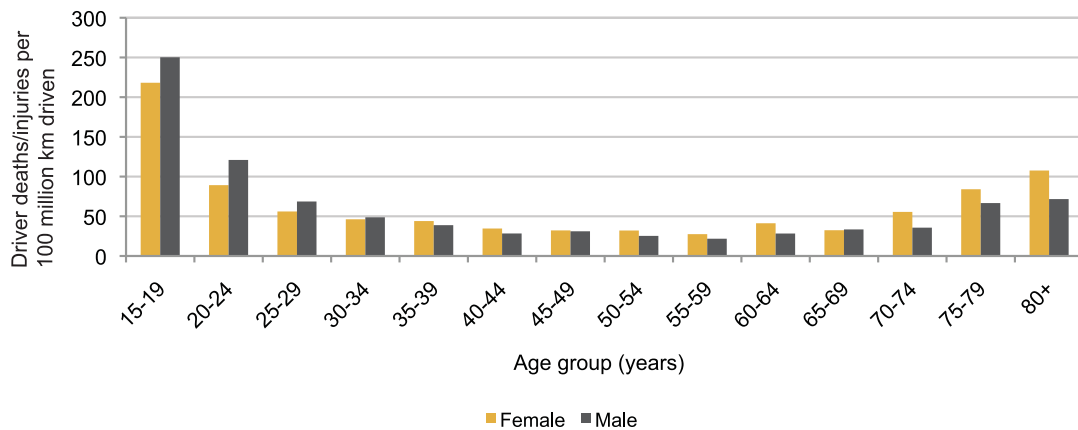
a. Drivers involved in fatal or injury motor vehicle crashes per year, by age and gender (2003-2008)



b. 100 million km driven per year by age and gender (2003-2008)



c. Risk of drivers involved in fatal or injury motor vehicle crashes per 100 million km driven by age and gender (2003-2008)



A snapshot of passenger risk

We spend 27 percent of our time travelling as a car or van passenger. From our all modes comparison, we know that passengers in these vehicles have a lower risk of death or injury than drivers, but do the same age and gender risk patterns hold? How large is the risk for those too young to make a choice about their travel mode?

Passenger death and injury numbers (Figure 22, top panel) peak around those aged 15-24. There is little difference in absolute numbers between males and females, although the number of female passengers killed or injured per year is generally slightly higher than males for those over 25 years old.

Passenger travel (Figure 22, middle panel) is highest amongst those too young to drive (0-14 years old) and those in the age groups most likely to be in the process of getting a driving licence (15-19 years old). Women travel further than men as passengers in most age groups but especially over the age of 30.

From Figure 22 (bottom panel), the passenger age groups most likely to be killed or injured per 100 million km travelled are those aged 15-24 years old. For ages 0-14 years old, the risk is similar for both males and females, but the risk is much higher for males aged 15-24 and 30-44 than females of the same age groups. The lower numbers of older passengers (over 75 years old) may distort the risk obtained. It should also be observed that older passengers are more fragile and are more likely to be injured when involved in a crash, which will increase the risk rate.

From passenger data in the travel survey, we know that 15-24 year old drivers are most likely to be travelling with passengers of their own age group². This means that passengers in these age groups are more likely to be travelling with a higher risk driver, leading to a higher risk of being in a crash.



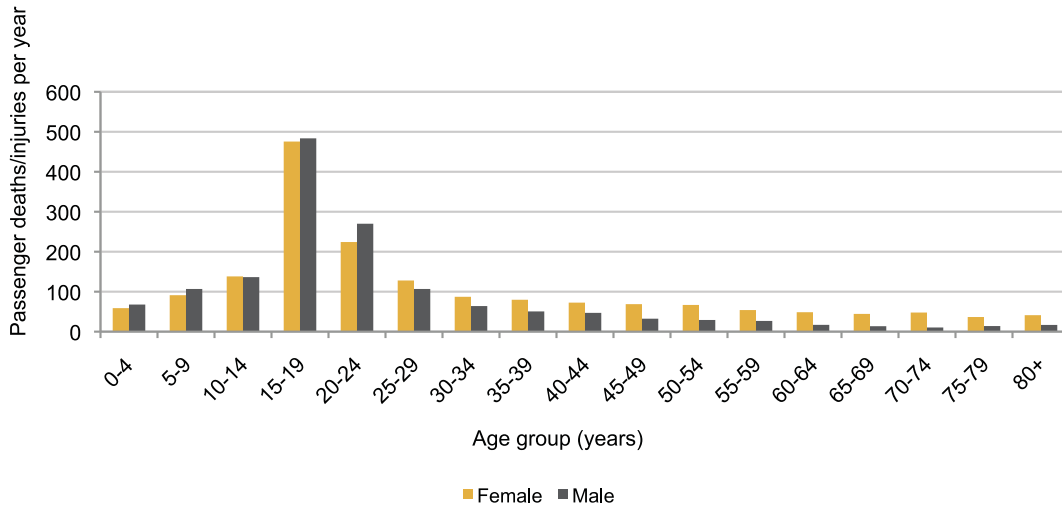
Children under 10 years old have the lowest risk of any passengers of being killed or injured in motor vehicle crashes per distance travelled.

Photo courtesy of NZTA

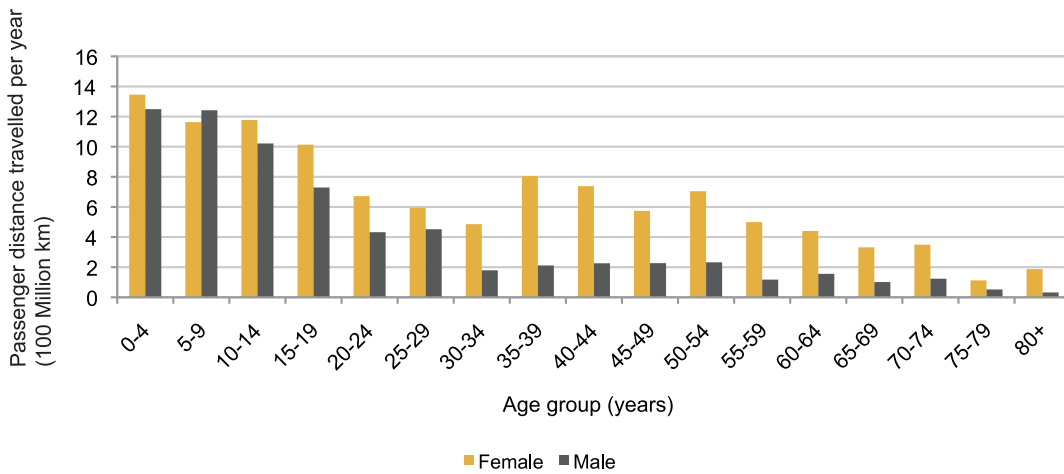
2. Figure 8, Driver Travel fact sheet, found at www.transport.govt.nz/research/latestresults/

Figure 22: Passenger deaths/injuries in motor vehicle crashes per year, by age and gender (2003-2008)

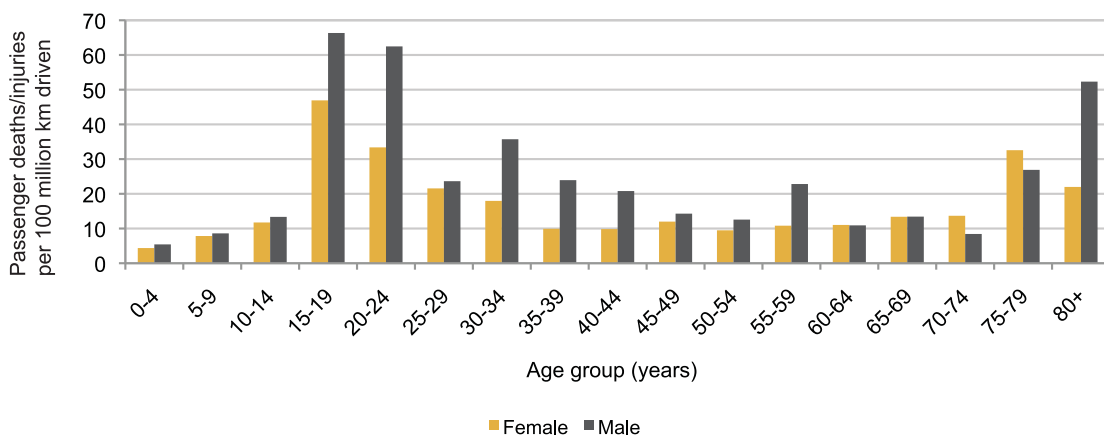
a. Passenger deaths/injuries in motor vehicle crashes per year, by age and gender (2003-2008).



b. 100 million km travelled per year by passengers, by age and gender (2003 - 2008).



c. Passenger deaths/injuries in motor vehicle crashes per 100 million km travelled, by age and gender (2003-2008).



A snapshot of pedestrian risk

Twelve percent of our time travelling is spent walking so it is useful to know how risky this mode is. We already know that it is one of the safest travel modes by time spent travelling, but is less so per distance travelled, due to the slower speeds involved in walking. But how does this compare by age and gender?

As stated in the section on trends in walking, the travel survey focuses on travel on our road and footpath network and does not include tramping or walking around farms or shopping centres. We also only know the pedestrians killed or injured in motor vehicle crashes, so cannot comment on the risk of pedestrian-cyclist crashes, or in pedestrians hitting other pedestrians eg skateboarders.

Ages 5-24 years old are the most often injured age groups for pedestrians, with the highest numbers of deaths and injuries in motor vehicle crashes per year (Figure 23, top panel). In all four of those age groups, males are killed or injured in higher numbers than females.

With respect to time spent travelling (Figure 23, middle panel), generally females spend more time walking than males. For both males and females, the age groups which spend most time walking are 15-19, 20-24 and 10-14 year olds.

While females often do more walking, males are more likely to be killed or injured given the smaller amount of walking they do (Figure 23, bottom panel). Highest risk age groups are 5-9 years old and 80+ years old, but part of this is a reflection of the fragility of those age groups in terms of how easily they are injured when they are hit. Other potential factors are speed when crossing the road, and in the case with the younger pedestrians, lack of experience and/or awareness in traffic situations.

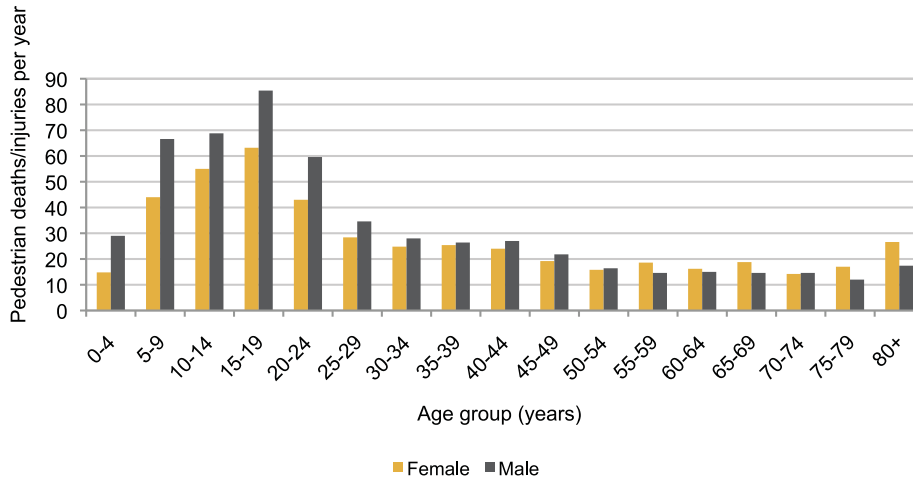


For pedestrians, the risk of being killed or injured in a motor vehicle crash is generally higher for males than females. Boys aged 5-9 years old have the highest pedestrian risk.

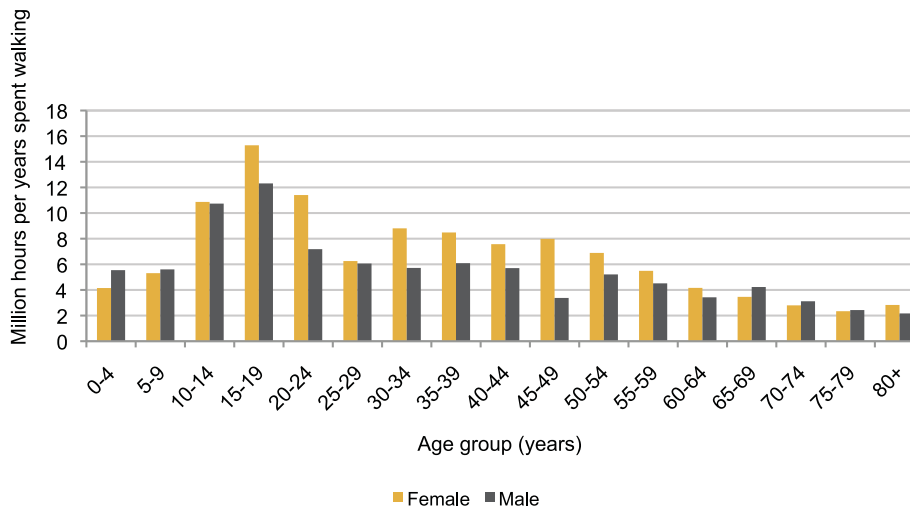
Photo courtesy of NZTA

Figure 23: Pedestrian deaths/injuries on motor vehicle crashes

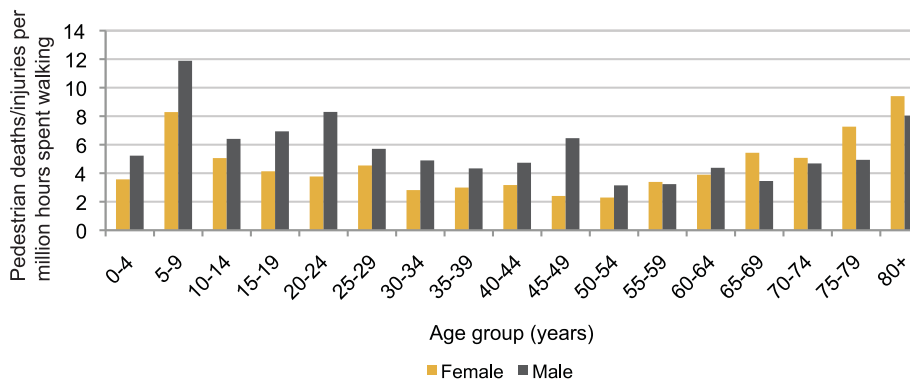
a. Pedestrian deaths/injuries in motor vehicle crashes per year by age and gender (2003-2008)



b. Million hours per year spent walking, by age and gender (2003-2008)



c. Pedestrian deaths/injuries in motor vehicle crashes per million hours spend walking, by age and gender (2003-2008)



A snapshot of cyclist risk

Cycling is the second most risky mode by time spent travelling and distance travelled. As stated earlier, cycling makes up one percent of our travel time and is a popular mode of travel for recreation as well as travel. But it is one of our more vulnerable modes of travel.

As discussed in the section on cycling trends, the time spent cycling and the distance cycled by children has decreased over the past 20 years. There has been no such decrease for adults. Cyclist deaths and injuries in motor vehicle crashes have followed a similar pattern.

Table 12 examines cyclist risk in three main age groups – primary and intermediate school aged (5-12 years old), high school/college aged (13-17 years old), and adult (18 years and over). As stated when comparing modes, the speed of travel makes a big difference. While children aged 5-12 have the lowest risk of death or injury per time spent travelling, they have the highest risk per distance travelled due to the longer time exposure for travelling the same distance as older cyclists. This is simply because they cycle more slowly than adults and take longer to cover the same distance, averaging approximately seven km per hour. In contrast 13-17 year olds average 10 km per hour and adults average 15 km per hour.

As noted, the crash data presented here only includes crashes when a motor vehicle is involved.



Photo courtesy of NZTA

Table 12: Cyclist travel and risk by age group (2003-2008)

Age	PER YEAR				
	100 million km	Million hours	Deaths and injuries	Deaths/injuries per million hours	Deaths/injuries per 100 million km
5-12 years	0.26	3.6	108	30	421
13-17 years	0.36	3.4	127	37	352
18 +	2.22	15.2	531	35	240

Motorcycling risk

Motorcycling is the riskiest of our travel modes by time spent travelling and by distance travelled.

Motorcyclist deaths on New Zealand roads have decreased dramatically over the past 20 years, declining from a high of around 130 per year in the late 1980s, to 27 in 2003. Since then however, the number of motorcyclist deaths has started climbing again, reaching 37 in 2007. Injury rates also follow this pattern with a decline since the 1980s which has been reversing since 2000 onwards, with a 73 percent increase in deaths and injuries between 2003 and 2007.

We have some indication of a change of travel from the light fleet statistics which indicate motorcycle vehicle kilometres travelled (VKT) has increased from 0.17 billion km in 2003 to 0.27 billion in 2007³, indicating a 59 percent increase in travel on motorcycles.

This correlates with motorcycle usage measured in the travel survey, with the distance and time spent motorcycling declining from 1989/1990 to 1997/1998, but increasing again by 2003–2008.

The overall effect appears to be a decline in the risk per time spent motorcycling and distance motorcycled. It remains to be seen if the most recent travel changes will translate to a change in motorcyclist risk.



While still the riskiest mode of travel, motorcyclist risk has decreased over the past 20 years.

Table 13: Motorcyclist travel, deaths and injuries and associated risks

Travel, deaths, injuries and risks	1989/1990	1997/1998	2003 - 2008
Distance motorcycled per year (100 million km)	3.1	1.8	2.4
Time spent motorcycling per year (million hours)	10.4	5.8	8.0
Motorcyclist deaths/injuries per year	2386	1084	1039
Motorcyclist deaths per year	129	55	36
Deaths/injuries per million hours travelled	230	190	130
Deaths/injuries per 100 million km travelled	760	610	430

3. New Zealand vehicle fleet annual statistics 2008 annual spreadsheet, Table Fleet travel 2000-2007, found at www.transport.govt.nz/research/newzealandvehiclefleetstatistics/

List of tables

Table 1	100 million km travelled per year, by mode (road-based modes only, ages five and over)	04
Table 2	Million hours per year spent travelling by mode (ages five and over)	05
Table 3	How people travel to different destinations - mode share of distance (2004-2008)	13
Table 4	Travel from home to work on weekday mornings (6 - 9.30 am)	14
Table 5	Primary school children - travel from home to school	16
Table 6	Secondary school age - travel from home to school	17
Table 7	Total distance driven, by age group	18
Table 8	Total time spent driving, by age group	19
Table 9	Trends in hours spent walking each week per person by age group	25
Table 10	Trends in time spent cycling and distances cycled per person per week, by age group	26
Table 11	Comparative deaths and injuries and distances and time spent travelling by mode	29
Table 12	Cyclist travel and risk by age group (2003-2008)	38
Table 13	Motorcyclist travel, deaths and injuries and associated risks	39

List of figures

Figure 1	Weekly time spent travelling per person (ages 5 and over)	05
Figure 2	Distance travelled per person, per year, by age group (2004-2008)	06
Figure 3	Weekly time spent travelling, by age group (2004-2008)	07
Figure 4	Distance travelled per person, by region of residence (2004-2008)	09
Figure 5	Weekly time spent travelling per person, by region of residence (2004-2008)	09
Figure 6	Annual distance driven per driver, by region of residence	10
Figure 7	Weekly time spent walking per person	11
Figure 8	Why and how people travel - mode share of time spent travelling (2004-2008)	12
Figure 9	Reason for travel, by age group (2004-2008)	15
Figure 10	Travel from home to work on weekday mornings	15
Figure 11	Travel to school by children (aged 5-12)	17
Figure 12	Travel to school by secondary school students (ages 13-17)	17
Figure 13	Distance driven per driver (cars, vans, utes and SUVs)	19
Figure 14	Females: Lifetime driving experiences by current age group	21
Figure 15	Males: Lifetime driving experiences by current age group	22
Figure 16	Time spent travelling as a car or van passenger (hours per person per week)	23
Figure 17	Historical time series of time spent walking per person per week	25
Figure 18	Trends in time and distance spent cycling per week	27
Figure 19	Deaths/injuries per million hours spent travelling, by mode	30
Figure 20	Deaths/injuries per 100 million km travelled, by mode	31
Figure 21	Drivers involved in fatal or injury motor vehicle crashes per year	33
Figure 22	Passenger deaths/injuries in motor vehicle crashes per year, by age and gender (2003-2008)	35
Figure 23	Pedestrian deaths/injuries on motor vehicle crashes	37

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O'Fallon, C and Sullivan, C. 2004. Trip chaining: understanding how New Zealanders link their travel. *Transfund Research Report No 268*. 70pp.

The New Zealand Vehicle Fleet: Fleet statistics 2008 (2009)

Additional information

Transport Monitoring Indicator Framework
www.transport.govt.nz/ourwork/transportmonitoring/

Cyclist fact sheet (cyclists involved in motor vehicle crashes)
www.transport.govt.nz/research/cyclistcrashfacts/

Pedestrian fact sheet (pedestrians involved in motor vehicle crashes)
www.transport.govt.nz/research/pedestriancrashfacts/

More results from the New Zealand Household Travel Survey
www.transport.govt.nz/research/latestresults/

New Zealand vehicle fleet annual statistics
www.transport.govt.nz/research/newzealandvehiclefleetstatistics/

O'Fallon, C and Sullivan, C. 2009. Trends in trip chaining and tours: analysing changes in New Zealanders' travel patterns using the Ongoing New Zealand Household Travel Survey. *NZ Transport Agency Research Report 373*. 66pp.

More information about the background to the survey
www.transport.govt.nz/research/travelsurvey/

Glossary

Census meshblock: Geographical units varying in size from a city block in urban areas to extensive tracts of land in rural areas used for surveying purposes.

Crash Analysis System: (CAS) Integrated computer system that provides tools to collect, map, query and report on crashes on New Zealand roads.

Distance: For road-based travel, distances are calculated by measuring the distance from the start address along the roads to the finish address. If an unusual route was used, the interviewer records an intermediate point to indicate the route; otherwise, the journey is assumed to follow the quickest available route.

Driver: For the purposes of this report, driver refers to drives of light 4-wheel vehicles ie cars, vans, utes and SUVs. Motorcyclists have been classified separately. Professional driver travel for the purposes of work (eg taxi drivers working or couriers working) has been removed, but their personal travel data has been retained.

Duration: For road based travel, respondents were asked to record their travel start time and their travel end time and from that, a duration for the travel was calculated.

Household: A group of people living at the same address and sharing facilities but not necessarily financially interdependent. May be an individual, a couple, family, flatmates or a combination of these (eg family plus boarder).

Household vehicle: A vehicle which is owned by a household member and is generally parked at the household overnight.

Indicator: A measure used to track progress against an objective over time.

Journey: A series of one or more trip legs where the only intermediate stops are to change to another mode.

Major urban area: A very large urban area centred on a city or major urban centre. This uses the Statistics New Zealand criteria of an urban area with a population of 30,000 or more and includes satellite areas eg Kapiti, Cambridge.

Passenger: Passenger in a private light 4-wheel vehicle (car, van, ute or SUV). Passengers in buses, trains and

taxis are coded under those categories. Aircraft and boat passengers are included in the 'Other' category.

Rural area: Areas with a population of less than 9,999 people. (Statistics New Zealand definition).

Secondary urban area: An urban area with a population of 10,000 – 29,999 (Statistics New Zealand definition).

SUV: Sports utility vehicle. Normally, but not always, 4-wheel drive. Refers to light passenger vehicle with high wheel base and distinctive body shape.

Towns and rural: This uses the Statistics New Zealand criteria of an urban area between 10,000 – 29,999 or a rural area with a population of less than 10,000, including satellite areas.

Travel: Includes all on-road travel by any mode, any walk which involves crossing a road or walking for 100 metres or more along a public footpath or road, cycling on a public road or footpath and some air and sea travel. Excludes off-road activities such as tramping, mountain biking and walking around the mall or around the farm.

Travel mode: The method of travel. Includes light 4-wheel vehicle driver, light 4-wheel vehicle passenger, pedestrian, cyclist, motorcycle rider or passenger, bus or train passenger and ferry or aeroplane passenger. Passengers in buses, trains and taxis are coded under those categories. Aircraft and boat passengers are included in the 'Other' category.

Trip purposes / destinations:

Return 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, travel to any other jobs and travel done for work purposes.

Work - Employer's business includes work-related travel other than to and from work (eg travelling to meetings or clients).

Education is for travel by students only and includes institutions such as primary and secondary schools, universities etc. It does not include preschool education such as kindergarten, play centre, crèche, kōhanga reo etc which are included under *social visit/entertainment*.

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 eg eating out at a restaurant or food court, picnics etc.

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

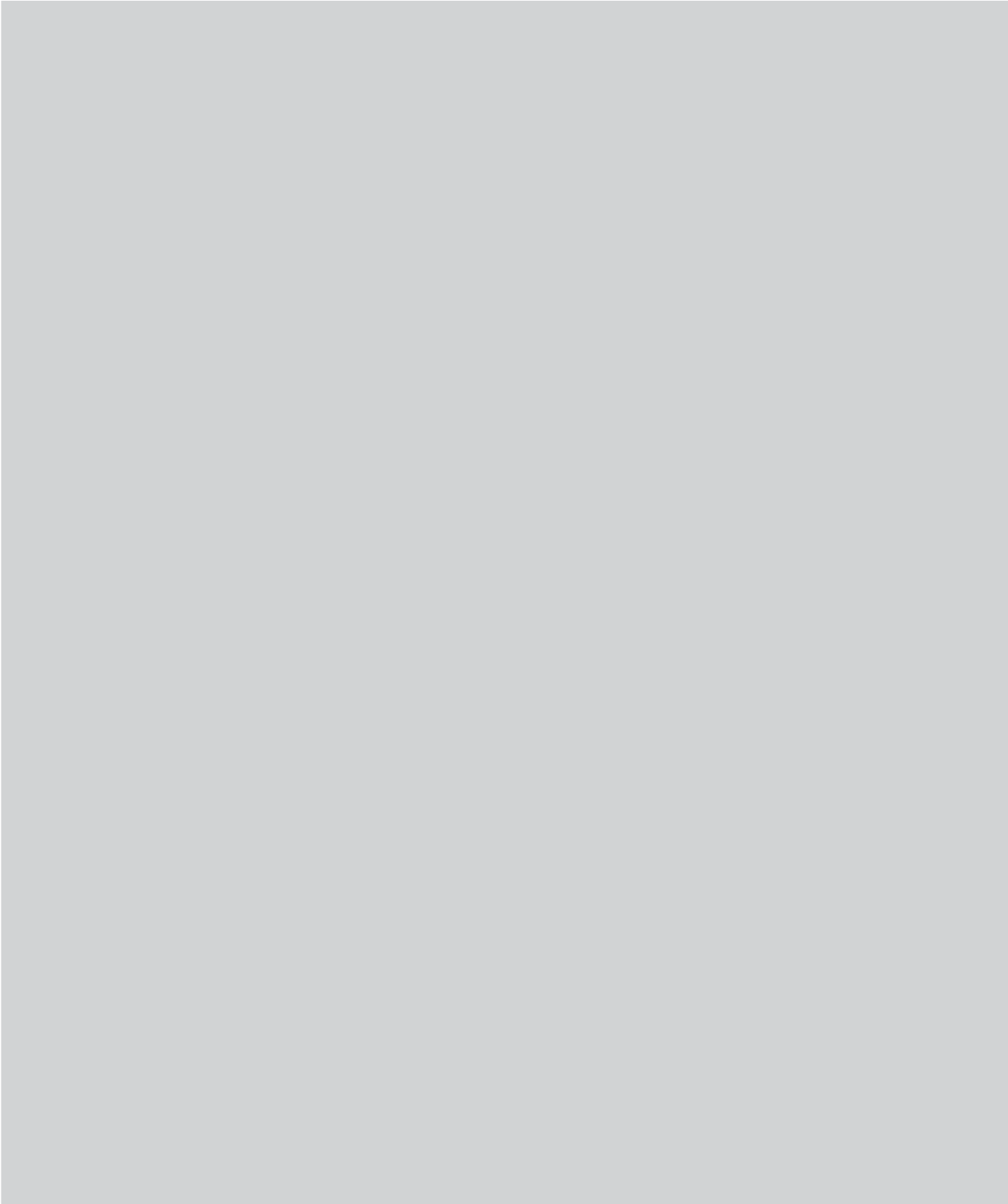
Personal business includes stops made to transact personal business where no goods were involved. This includes stops made for medical or dental needs and for dealing with government agencies involved with social welfare.

Accompany or transport someone covers when the reason for travel is to go somewhere for someone else's purpose.

Change mode of travel covers when the purpose of the stop was only to change to another mode of transport.

Walk: Includes walkers, joggers, skateboarders and children on tricycles. Does not include off-road walking such as tramping or walking around a mall or farm.

Ute: Utility vehicle - a light flatbed truck weighing up to 3.5 tonnes. Typically based on a car or van model with a front cab and a flatbed instead of rear seats or luggage space.



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