Resource 1 – Facts and figures

Overview

Introduction

In this document, you can find a vast range of facts and figures that you can use to illustrate the current dominance of the car, its impacts and what workplace travel plans have been shown to achieve in reducing car dependence.

Contents

This document contains the following topics:

Increasing car use

Car travel in New Zealand

Overall car travel

- More than half of New Zealanders' travel time is spent driving.[1]
- Driver and passenger travel together account for 80% of all time spent travelling.
- The total distance driven increased by 16% (2% per year) between 1997/98 and 2003–06. Population increased by 7% over same period.
- The driver was the sole vehicle occupant in two-thirds (68%) of **trip legs** in cars, vans and utes.
- On average, New Zealand adults now spend four and three-quarter hours a week driving, compared with less than four hours 20 years ago.[2]
- One-sixth of household car trips (trip chains) in New Zealand are under 2km long and almost half are less than 6km long.[3]
- Short distance car trips are particularly polluting, as cold engines consume around 40% more fuel, produce more emissions and increase engine wear and tear.[4]

Travel to work

- Travel to work is the largest travel category and most dependent on driving.
- 72% of time spent travelling to work is driver travel (down from 77% in 2003–2006).
- Nearly 84% of known distance travelled to work is as a driver (excludes walking, train, plane or ferry) (down from 90% in 2003–2006).
- Work-related travel accounts for one-third of all household driving time and distance, most of which is commuting to and from work.[5]
- 90% of people travelling to work in cars are single occupants.[6]
- 77% of individuals drove a car to work in 2006, an increase from 73.9% in 1996.[7]

[1] Ministry of Transport (2008) 'Comparing travel modes' in *Household Travel Survey*, v1.4 (rev Jan 2008), 1–13, MoT, Wellington. www.transport.govt.nz/research/Documents/Comparing-travel-modesv1.4.pdf (accessed 2 February 2010)

[2] Ministry of Transport, 'How New Zealanders travel: trends' in *New Zealand household travel 1989–2008*, MoT, Wellington, page 4. www.transport.govt.nz/research/Documents/How%20New%20Zealanders%20travel%20web.pdf (accessed 2 February 2010)

[3] Ministry of Transport, *Household Travel Survey, 2003–2009* (sourced from: Lynley Povey, L.Povey@transport.govt.nz, 3 February 2010).

17% (one-sixth) of driver trip chains are less than 2km long.
43% of driver trip chains are less than 5km long.
48% of driver trip chains are less than 6km long.
53% of driver trip chains are less than 7km long.
65% are less than 10km long.

[4] www.mfe.govt.nz/issues/transport/sustainable/vehicles.html (accessed 9 July 2010)

[5] Ministry of Transport (2007) 'Driver travel in cars, vans, utes and SUVs' in *Household Travel Survey*, v1.2 (rev May 2007). www.transport.govt.nz/assets/NewPDFs/Driversfinalv1.2.pdf (accessed 2 February 2010)

[6] Ministry of Transport (2008) *The New Zealand Transport Strategy 2008*, MoT, Wellington, page 87. www.transport.govt.nz/ourwork/Pages/AppendixC-TheNewZealandTransportStrategy.aspx (accessed 2 February 2010)

[7] Statistics New Zealand (2009) 'More Wellingtonians use public transport to get to work' in *New Zealand official yearbook 2008* (106ed), David Bateman, Wellington, page 432.

Car ownership in New Zealand

Rates of car ownership and access to a car:

- The New Zealand vehicle ownership rate is 0.75 vehicles per person. This has been steadily rising from 0.69 vehicles per person in 2002.[8]
- The latest OECD comparison (2006) shows that New Zealand ranked third highest amongst OECD countries in terms of vehicle ownership per person, behind Portugal (78) and United States (76).[9]
- In 2007, there were 70 light vehicles for every 100 New Zealanders, compared to 64 in 2001 (Ministry of Transport, 2008c).[10]
- New Zealand had the highest number of passenger vehicles* per 1000 in 2005 at 607 vehicles per 1,000, followed by Italy at 595, Switzerland at 520, Portugal and Slovenia at 471, USA at 461[11] (*seating no more than nine passengers).
- 92% of households have access to a motor vehicle, compared with 87% in 1986.[12]

[8] http://www.transport.govt.nz/ourwork/TMIF/Pages/TV035.aspx (accessed 2 February 2010)

[9] www.mfe.govt.nz/environmental-reporting/transport/vehicle-km-travelled/total-vkt/ (accessed 2 February 2010)

[10] www.mfe.govt.nz/environmental-reporting/report-cards/transport/2009/index.html (accessed 2 February 2010)

[11] The World Bank. 2008 *World development indicators*. Washington, D.C.: The World Bank. http://books.google.co.nz/books?id=O67oDJW01pwC&printsec=frontcover&dq=world+development+indicators&source=bl&ots=iBpXNnT_9D&sig=T9KKIEFRlFBBP4qTSQCWaDTdWJo&hl=en&ei=u5dnS4HaO4b2sgP81N2CBQ&sa=X&oi=book_result&ct=result&resnum=5&ved=0CCsQ6AEwBA#v=onepage&q=(cars%20OR%20vehicles)%20ownership&f=false

[12] www.transport.govt.nz/ourwork/TMIF/Pages/AM006.aspx (accessed 2 February 2010)

Impacts of increasing car use

Economic – congestion

The Ministry of Transport's Surface Costs and Charges study in 2005 estimates that total congestion in New Zealand costs us $1 billion per year, with $700 million of that cost felt in Auckland, $101 million in Wellington, and $77 million met by Christchurch. Over 90% of this congestion occurs in the three main centres, and over 70% of it in Auckland.[13]

Traffic congestion continues to affect the quality of life in the United States. According to the Texas Transportation Institute (TTI), congestion has several effects on travellers, business, agencies, and cities. For travellers in 2007, congestion caused 4.2 billion hours of travel delay and 2.8 billion gallons of wasted fuel, representing a total average cost of $87.2 billion.[14]

Economic – cost of car park construction

The cost of car park construction can be significant[15]:

At grade car parking:

- $120-150 per m^2*
- depending on ground conditions, there could be significant additional cost involved.

Structured car parking building:

- $750-800$m^2$*
- including architectural façade and sub-ground structure; some additional cost could be incurred in poor ground conditions.

Basement car parking above water table:

- $900–1000$m^2$*
- depending on ground conditions.

Basement car parking below water table:

- $2000–2500$m^2$*
- requires a building on top to hold the car park down against water pressure.

*These figures do not include costs for GST, land costs, design fees, resource consent, building consent, site contamination etc.

Average area per car

- $30m^2$ per car for a very efficient building (double loaded 'corridor' – ie one isle feeding two rows of car parks)
- up to $45m^2$ per car for an inefficient building (single bay per isle/irregular floor plate).

[13] 'Annex B9: Road Congestion' and 'Table B9.1: Summary of congestion cost findings' In: *Surface Transport Costs and Charges: Main Report*, by Booz Allen Hamilton, et al. page 133. Wellington: Ministry of Transport. 2005.
Phase 2 of the *Understanding Transport Costs and Charges (UTCC)* study currently being undertaken by the Ministry of Transport will update estimates for the cost of congestion in the three main urban cities (Auckland, Wellington and Christchurch) for both recurrent and non-recurrent delays. It is anticipated that this study will be completed by around December 2010.

[14] Texas Transportation Institute. 2009 'What does congestion cost us?' In: *Urban mobility report and appendices*. B-19 http://mobility.tamu.edu/ums/report/congestion_cost.pdf (accessed 4 February 2010)

[15] Figures according to Infratil, Davis Langdon per email

Social – health	• Walking by those aged 5–14 years has decreased from 1.5 hours per person per week in 1989.90 to 1.1 hours per person per week in 2003–6.[16] • One in three adults is overweight.[17] • Over 2000 deaths per year may be result of low physical activity.[18] • Air pollution from motor vehicles contributes to the premature death of 500 people per year and another 809 are suffering serious illness.[19] • It is estimated that 399 people per year will die prematurely due to exposure to particulates from vehicles.[20] • 389 road deaths (2009).[21] • One third of vehicle trips were less than two kilometres, and two thirds were less than six kilometres.[22] • Three out of every four trips are by motor vehicle.[22] • Drivers suffer stress while driving, particularly in congested areas. When drivers are surveyed, about half say they wish to drive less.[23] • Staff who are physically active for 20 minutes a day take less than half the annual sick leave of staff who are active for only 10 minutes a day.[24]
Environmental – emissions	• Vehicle exhaust emissions are a major source of air pollution in some areas, particularly around busy road corridors. Pollutants include carbon monoxide (CO), nitrogen dioxide (NO_2), benzene, and particulate matter.[25] • Vehicles also emit carbon dioxide (CO_2), which is a greenhouse gas. Transport is responsible for 44% of New Zealand's carbon dioxide emissions, and around 16% of our total greenhouse gas emissions.[25] • Road transport vehicles emit as estimated 10.9 million tonnes of CO_2 per year.[26]

[16] Ministry of Transport. 2008. Walking for transport: Ongoing New Zealand household travel survey 2003-2007. Wellington, page 1. www.transport.govt.nz/topic/Walking/Documents/Walking_for_transport_2008.pdf (accessed 4 February 2010)
[17] Ministry of Health. Obesity in New Zealand. Wellington. page 1. www.moh.govt.nz/obesity (accessed 4 February 2010)
[18] Ministry of Health. Physical activity DHB toolkit. Wellington:
www.moh.govt.nz/moh.nsf/by+unid/7DCA3A96338A2777CC257234006F30F0?Open (accessed 4 February 2010)
[19] Ministry of Transport. 2007. Sustainable transport discussion paper: update of the New Zealand Transport Strategy. Wellington. page 46
[20] Fisher, G.W., Rolfe, K.A., Kjellstrom, T., Woodward, A., Hales, S., Sturman, A.P., Kingham, S., Petersen, J., Shrestha, R., King, D. 2002. Health effects due to motor vehicle air pollution in New Zealand. Report to the Ministry of Transport. page 66
[21] Road death statistics www.nzta.govt.nz/resources/road-deaths/toll.html (accessed 5 February 2010)
[22] Ministry of Transport. 2002. New Zealand transport strategy. Wellington. page 39.
[23] Dudleston, A. ,Hewitt, E., Stradling, S. 2005. Public perception of travel awareness. Phase 3. Edinburgh: Scottish Executive Social Research. page 60
[24] Department for Transport. 2008. *The essential guide to travel planning*. London. page 7. www.dft.gov.uk/pgr/sustainable/travelplans/work/essentialguide.pdf (accessed 5 February 2010)
[25] Ministry for the Environment. *Environmental effects*. Wellington. www.mfe.govt.nz/issues/transport/environmental.html (accessed 5 February 2010)
[26] Ministry of Transport. 2007. Sustainable transport discussion paper: *Update of the New Zealand transport strategy*. Wellington, page 61.

	• Each New Zealander's share of road transport emissions is 2.6 tonnes per year.[26] • Estimated that greenhouse gas emissions to increase by 40% by 2030.[27] • About 86% of New Zealand's oil consumption is within the transport sector.[28]
Environmental – by-products	• Waste products from vehicles (eg from braking, tyres) mix with rain water and can enter surface and groundwater.[29] • Transport can cause heavy metal contamination of harbours and estuarine areas. Contaminated stormwater can make the receiving water unsafe to swim in, drink, or collect shellfish.[25] • In-river artificial structures such as culverts and fords can disrupt fish migration when poorly designed or installed.[29] • Erosion and sediment deposition (eg from road works, steep slopes) have a detrimental effect on the environment.[30] • Suspended sediments eg from road works can affect water clarity, favouring species that prefer cloudy conditions.[25] • Transporting hazardous substances carries a risk of spillage. Marine oil spills pose a serious environmental threat.[31]
Environmental – expansion	• Transport infrastructure (roads, parking etc) currently covers 25–30% of land within most cities.[32] • Transport has the potential to damage or disturb places of cultural, archeological and historic importance.[33] • Urban expansion can create inefficient travel patterns and congestion.[25] • Habitat fragmentation by roads or rail tracks can lead to biodiversity losses, and provide corridors for the spread of pests and weeds.[25] • Many difficult waste streams are transport-related. These include end-of-life vehicles, tyres, and oil. Used oil is New Zealand's largest non-aqueous liquid waste (at 30 million litres a year).[34] • Older air conditioning systems may contain ozone-depleting CFCs, while newer ones mainly have HFCs, which are greenhouse gases.[25] • Vehicle air conditioners consume more energy than any other auxiliary vehicle equipment.[35]

[27] Ministry of Transport. 2007. Sustainable transport discussion paper: Update of the New Zealand transport strategy. Wellington, page 48

[28] Ministry of Transport. 2007. Sustainable transport discussion paper: Update of the New Zealand transport strategy. Wellington, page 47

[29] Transit New Zealand, Environmental Plan, Version 2, June 2008. Wellington, page 33

[30] Transit New Zealand, Environmental Plan, Version 2, June 2008. Wellington, page 40

[31] www.maritimenz.govt.nz/Environmental/Oil-and-oily-waste/Oil-biological-impact.asp accessed 7 July 2010

[32] Ministry of Transport. 2002. New Zealand transport strategy. Wellington. page 47

[33] Transit New Zealand, Environmental Plan, Version 2, June 2008. Wellington, page 52

[34] Ministry for the Environment. Used oil. Wellington. www.mfe.govt.nz/issues/waste/special/oil/index.html (accessed 5 February 2010)

[35] www.epa.gov/cpd/mac/ accessed 8 July 2010

Environmental – biosecurity	• Transport can increase biosecurity risks. As well as undesirable goods and people, international travel and trade can allow new organisms or diseases to enter New Zealand, such as Didymo.[36] • Pests can also spread within New Zealand unintentionally by transport, such as Argentine ant.[37]
Environmental – Noise and vibration	• Transport is the main source of environmental noise pollution.[38] • Noise pollution can have effects such as hearing impairment, interference with speech communication, disturbance of rest and sleep or mental-health and performance effects.[39] • Vibrations can be annoying; vibration associated with construction activity can potentially damage buildings and structures.[40] • High levels of noise can depress property values.[25]

[36] http://www.biosecurity.govt.nz/didymo accessed 10 June 2010

[37] http://www.biosecurity.govt.nz/pests-diseases/animals/invasive-ants/argentine-ant/pest-spread.htm accessed 8 July 2010

[38] World Health Organisation. 1999. *Guidelines for community noise*. 1999, Geneva, page 6

[39] World Health Organisation. 1999. *Guidelines for community noise*. 1999, Geneva, page viii

[40] Transit New Zealand, *Environmental Plan*, Version 2, June 2008. Wellington, page 82

What travel plans can achieve

Do travel plans work?

New Zealand

The 2007/08 evaluation of ARTA's workplace travel plan programme showed the programme is growing more rapidly and is resulting in fewer car trips to work than anticipated.

'Five workplaces have completed and evaluated travel plans, and collectively have achieved a reduction of 355 car trips to work each morning peak. This reduction in car trips corresponds to 2.4 million fewer kilometres travelled, and a CO_2 reduction of 779 tonnes. The benefits of these five travel plans are at least 10 times the cost.'[41]

Australia

Employee surveys show that in most workplaces where a travel plan has been implemented, solo car commuting declined by an average of ten per cent in both Melbourne and Perth.[42] Some employers have recorded reductions of 30% or more, usually after changes to employer-provided car parking and active promotional efforts. Reductions in this range are consistent with experience in the UK. [43]

An evaluation of workplace travel plans in Australia found the following outcomes:

Between 2001 and 2003, car trips in a Brisbane CBD engineering firm fell from 34% to 16%, and public transport use increase from 57 to 74% of all trips.

The four Western Australian employers all recorded declines of 6–15 percentage points in car trips for commuting, and some rises in walking, cycling and other green travel alternatives.

In 2003, 19% of staff from The Alfred Hospital in Melbourne said they used the car less after the project, and 25% said they used public transport more.[44]

UK

In the UK, 'Experience from existing travel plans shows that for a well designed plan, a 15% reduction in car driver trips to site over about three years is a typical result'.[45]

[41] Auckland Regional Transport Authority. 2008. *TravelWise programme evaluation 2008*. Auckland: Auckland Regional Transport Authority [Held NZTA Library].

[42] Wake, David and David Meiklejohn. 2007. A tale of two cities: workplaces travel plan programs in Melbourne and Perth. Australasian Transport Research Forum (ATRF), 30th, 2007, Melbourne, Victoria, Australia. Vol. 30. page 8.

[43] Cairns, S, et al. 2002. *Making Travel Plans Work: Research Report* London: Department for Transport.

[44] *Evaluation of Australian TravelSmart Projects in the ACT, South Australia, Queensland, Victoria and Western Australia: 2001–2005: report to the Department of Environment and Heritage and State TravelSmart Program Managers.* 2005. Canberra, Act: Australian Greenhouse Office, Department of the Environment and Heritage.

[45] Department for Transport. 2008. *The Essential Guide to Travel Planning*. London: Department for Transport, page 19, quoting: Making travel plans work: lessons from UK case studies, Department for Transport, 2002. www.dft.gov.uk/pgr/sustainable/travelplans/work/essentialguide.pdf (accessed 11 February 2010)

Further studies

Studies from Smarter Choices – Changing the Way We Travel DfT July 2004:

Table 3.1: Changes in commuter car use at British organisations with travel plans[46]

Study	Conclusion
Cairns et al (2002)	A selection of good practice travel plans reduced commuter car driving by an average of at least* 18%. Plans which included parking management measures achieved an average reduction of car driving of >24%, compared with >10% for those that did not.
Organisational Coaching and Shreffler (1996)	Successful travel plans in the US typically reduce vehicle trips by 19%. Successful travel plans in the Netherlands typically reduce vehicle mileage by 20%.
Shoup (1997)	Eight Californian employers offering cash for parking had reduced single occupancy driving by an average of 13% and vehicle miles by 12%.
TCRP (1994)	49 US employers with travel plans had achieved an average vehicle trip reduction of 15%. Averages for different types of plans were: 9% if offering commuting alternatives only (such as van pools) 16% if offering financial incentives only (such as bus fare subsidy) 25% if offering financial incentives and services
Ligtermoet (1998)	40 Dutch employers (plus an unspecified numbers of others from review work) provided information about different types of plans. This suggested average reductions in vehicle kilometres of: 6–10% for plans with 'basic' measures 15–23% for plans with 'luxury' measures
Touwen (1999)	Information from different types of Dutch travel plan suggested average reductions in single occupancy vehicle kilometres of: 8% for plans with 'basic' measures 20% for plans with 'luxury' measures

Potential effect of reducing car use in New Zealand

In New Zealand's three major urban areas Auckland, Wellington and Christchurch, there were 854,934 car trips to work on Census Day 2006 (see tables below for details).

If travel plans created a 5% reduction in car use, there would be a saving of 42,747 trips and 192,226 kilometres per day. While this is hypothesised, it does demonstrate the potential that even small changes could have. The difference between a heavily congested road and a free flowing one can be a matter of just a few vehicles tipping it over capacity.

[46] Table taken from: Cairns S, Sloman L, Newson C, Anable J, Kirkbride A & Goodwin P. 2004. Workplace travel plans. Chapter 3 in Smarter choices: Changing the way we travel. London: Department for Transport www.dft.gov.uk/pgr/sustainable/smarterchoices/ctwwt/chapter3workplacetravelplans.pdf (accessed 5 February 2010)

Table: Private car trips to work on Census Day 2006[47]:

Urban area	Number of people	Median distance travelled (km)	Total distance travelled (km)
Northern Auckland Zone	66,660		
Western Auckland Zone	49,302		
Central Auckland Zone	96,891		
Southern Auckland Zone	89,928		
Total Auckland	**302,781**	5.3	1,608,552
Upper Hutt Zone	8,490		
Lower Hutt Zone	21,549		
Porirua Zone	9,918		
Wellington Zone	34,341		
Total Wellington	**74,301**	4.5	330,854
Total Christchurch	**93,615**	5.4	503,769
Total main urban areas	***705,078***	*4.6*	*3,246,489*

Work related car trips here refers to driver of a private car, truck or van
For employed usually resident population.

[47] Prepared by Rosemary Goodyear and Martin Ralphs of Statistics New Zealand. It is not a standard statistical output, but was prepared as an ad-hoc analysis.

Table: Company car trips to work on Census Day 2006[48]:

Urban area	Number of people	Median distance travelled (km)	Total distance travelled (km)
Northern Auckland Zone	15,789		
Western Auckland Zone	10,731		
Central Auckland Zone	17,823		
Southern Auckland Zone	17,838		
Total Auckland	**62,184**	4.9	302,914
Upper Hutt Zone	2,100		
Lower Hutt Zone	5,178		
Porirua Zone	2,355		
Wellington Zone	6,573		
Total Wellington	**16,209**	3.9	63,896
Total Christchurch	**18,273**	5.2	95,672
Total main urban areas	***149,856***	*4.0*	*598,035*

Work related car trips here refers to driver of a company car, truck or van

[48] Prepared by Rosemary Goodyear and Martin Ralphs of Statistics New Zealand. It is not a standard statistical output, but was prepared as an ad-hoc analysis.