Ministry of Transport
TE MANATŪ WAKA

The New Zealand Vehicle Fleet

ANNUAL FLEET STATISTICS 2012

FEBRUARY 2013

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STATISTICAL REPORT

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FOREWORD

The Annual Vehicle Fleet Statistics report is part of a range of research and analysis carried out by the Ministry of Transport to help us better understand the transport issues facing New Zealand. This report provides information on the number of vehicles on our roads (New Zealand's vehicle fleet) as well as their age, their fuel and emissions, and the distance they travel.

This year's report shows our light vehicle fleet continues to age. This is consistent with other countries, and it's likely that improvements in vehicle design and technology are helping vehicles stay on the road for longer. However, the average age of our light fleet, 13.2 years, is high by international standards.

2012 was unusual in that more new light vehicles entered the fleet than used imports. The last time that happened was 1996. The number of vehicle replacements is still relatively low which has resulted in the levelling off of the light vehicle fleet size and an increased proportion of older vehicles. The percentage of vehicles aged 15 years or more has increased from 25.2 percent in 2005 to 39.6 percent in 2012. It is only the low number of vehicles being taken off the road that has prevented the overall numbers in the fleet from dropping.

Martin Matthews
Chief Executive, Ministry of Transport

ACCESSING THE GRAPHS AND INFORMATION IN THIS REPORT

The graphs and information presented in this report, and the report itself, are available on the research tab of the Ministry of Transport website http://www.transport.govt.nz/research. A series of brief quarterly fleet reports are also available there.

The Ministry has developed a set of Transport Indicators, which include further information on the vehicle fleet, including some regional breakdowns. The Transport Indicators are available at the top left of the Ministry of Transport homepage www.transport.govt.nz.

DESCRIBING THE VEHICLE FLEET

this report is based on data from the Motor Vehicle Register . The statistics presented in this publication have been categorised differently to the traditional motor vehicle statistics produced by the Transport Registry Centre of the New Zealand Transport Agency (NZTA)[1]. The objective was to produce a categorisation better suited to the estimation of fuel use and levels of emissions.

There are two significant differences:

1) VEHICLE CATEGORISATION

The vehicle categories used in this report are:

- Light passenger
- Light commercial
- Truck
- Bus
- Motorcycle

NZTA categorisation	Fleet statistics categorisation
Passenger car/van	Light passenger
Goods vans/trucks/utilities	Light commercial if under 3500kg Truck if over 3500kg
Buses	Light commercial if under 3500kg Bus if over 3500kg
Motor caravans	Light commercial if under 3500kg Truck if over 3500kg
Motorcycles	Motorcycles
Mopeds	Motorcycles

2) VEHICLES LEAVING THE FLEET

The second difference is in judging when a vehicle has left the fleet. Unless a vehicle owner actively de-registers it, or the vehicle has not been re-licensed for 12 months, then the practice of the New Zealand Transport Agency has been to include those vehicles in fleet statistics. This is likely to over-estimate the size of the active fleet, as some vehicles will become inactive well within the 12 months.

In this report vehicles are considered to have left the fleet when their warrant of fitness or certificate of fitness[2] renewal is more than six months overdue. This is considered more realistic.

Appendix A expands on the reasons for these approaches.

[1] http://www.nzta.govt.nz/statistics/motor-vehicle-registration/index.html
[2] Warrant of Fitness is a 6 or 12 monthly vehicle inspection for private light vehicles (under 3500kg), and Certificate of Fitness is a 6 monthly vehicle inspection of commercial and heavy vehicles (over 3500kg).

1. SETTING THE SCENE – THE VEHICLE FLEET IN CONTEXT

HOW MUCH IS THE FLEET GROWING?

Figure 1.1 shows the light fleet (shown as light passenger and light commercial vehicles) makes up over 90 percent of the total vehicle fleet. The light fleet is made up of cars, vans, utes, four wheel drives, sports utility vehicles (SUVs), buses and motor caravans under 3.5 tonnes. Figure 1.2 shows the light fleet grew by 19 percent between December 2000 and December 2006 but only by 4.4 percent from December 2006 to December 2012.

However, the light fleet is not the fastest growing segment of the fleet. Figure 1.2 shows that motorcycle/ moped and bus numbers grew by 60 percent since December 2000.

The fleet has only grown slightly since December 2007. The whole fleet has increased in size by 2.6 percent in that time while the light fleet increased by 2.5 percent.

Figure 1.1 : Fleet composition

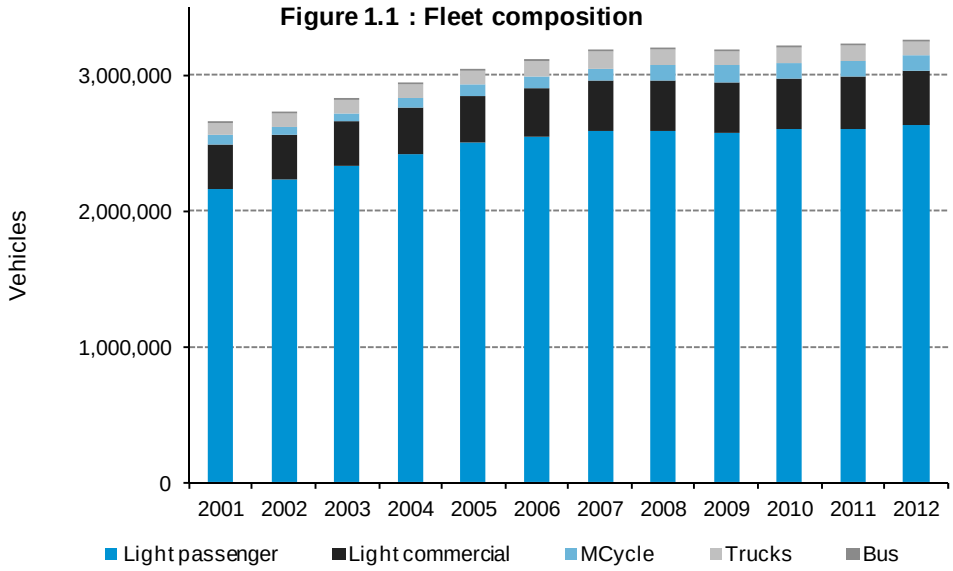
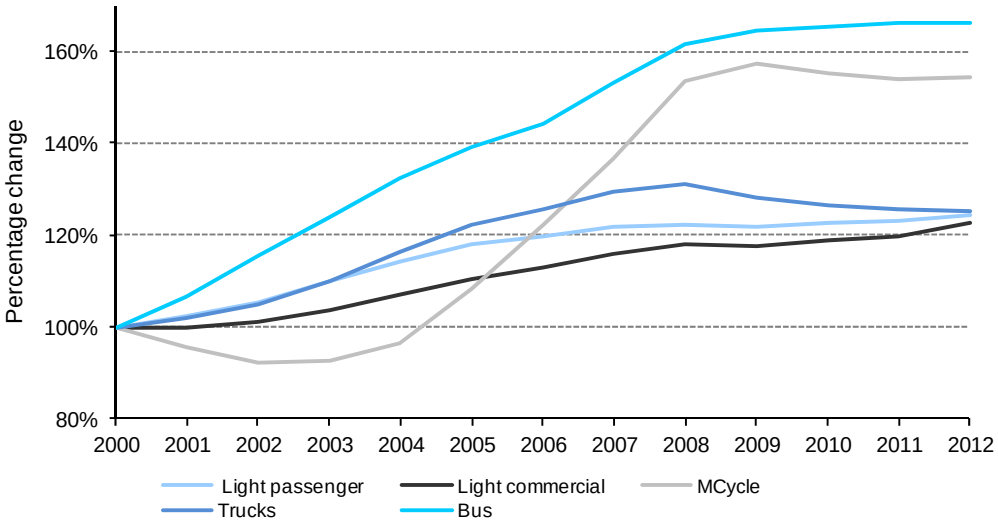


Figure 1.2 : Fleet composition relative to Jan 2000

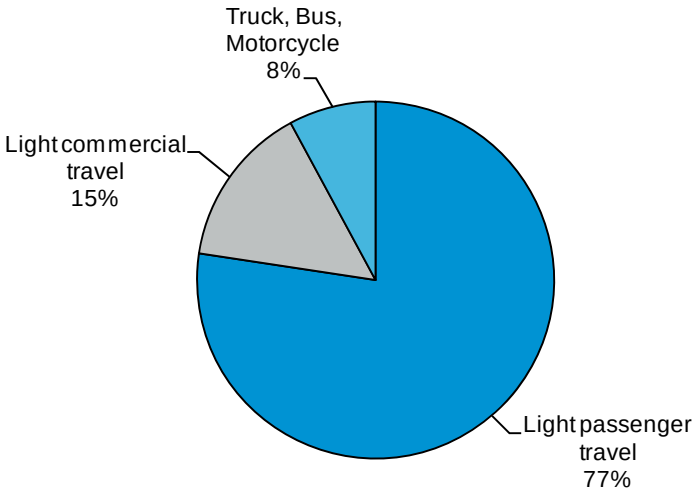


WHAT PART OF THE FLEET TRAVELS THE MOST?

This page will be updated in August 2013 when more accurate travel estimates for 2012 are available.

Travel on New Zealand roads is dominated by the light fleet. Light passenger vehicles contributed 77 percent of road travel in 2011, and light commercial vehicles a further 15 percent. Only eight percent of road travel was by other vehicles (motorcycles, heavy trucks and buses).

Figure 1.3a : Travel in 2011

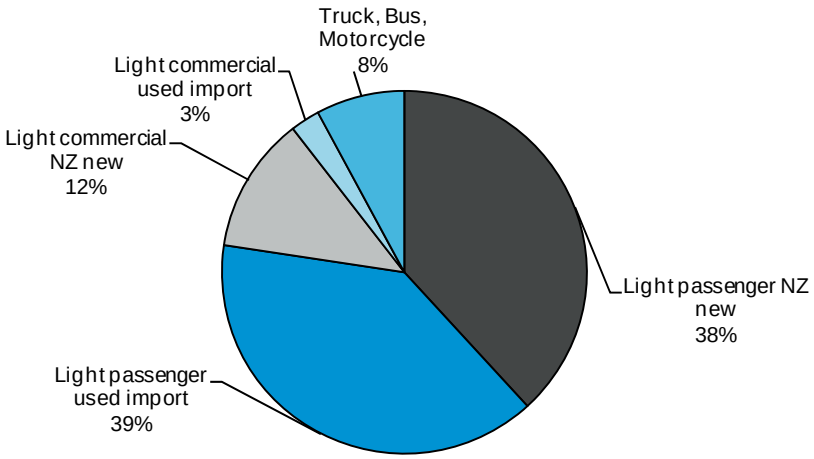


IS THE LIGHT FLEET TRAVEL DONE BY NEW ZEALAND-NEW OR USED IMPORTED VEHICLES?

The light passenger and light commercial fleets are significantly different. Light passenger travel[3] is almost equally split between vehicles imported new into New Zealand, and vehicles imported second-hand. Light commercial travel is dominated by New Zealand-new vehicles.

Also see Section 8.2, which provides a diesel/petrol breakdown.

Figure 1.3b : Travel in 2011, new/used import



[3] Travel has been estimated using the odometer readings from the (warrant of fitness or certificate of fitness) vehicle inspection system.

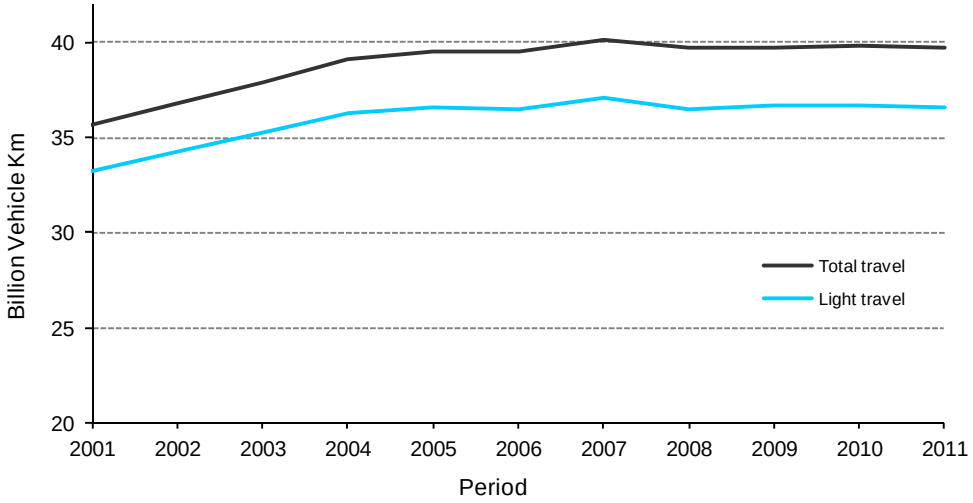
WHAT ARE THE TRENDS IN TRAVEL?

This page will be updated in August 2013 when more accurate travel estimates for 2012 are available.

Total annual travel in New Zealand was increasing until 2006 (up 13 percent from 2001 to 2006), but since then three periods of high oil prices and the economic downturn have seen a slight fall in travel (down 1 percent from 2007 to 2011).

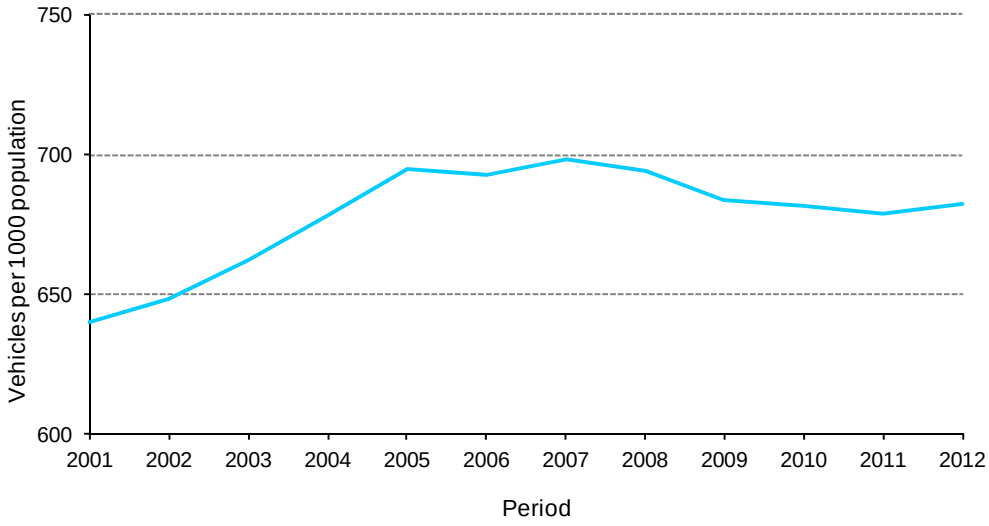
The growth in travel by the light fleet of 10.1 percent from 2001 to 2011 is less than the 30.2 percent growth in truck, bus and motorcycle travel during the same period.

Figure 1.4 : Light fleet total travel



Ownership per capita[4] of light vehicles increased significantly between 2000 and 2005. The increase reflected a number of factors, including the high value of the New Zealand dollar (which made vehicles cheaper), high employment and the positive economic outlook that typified that time. Light vehicle ownership per capita has declined in recent years, but increased again in 2012. It is almost back to the 2009 level. The peak rate was 698 light vehicles per thousand population in December 2007, and was 682 per thousand in December 2012.

Figure 1.5 : Light fleet ownership per 1000 population

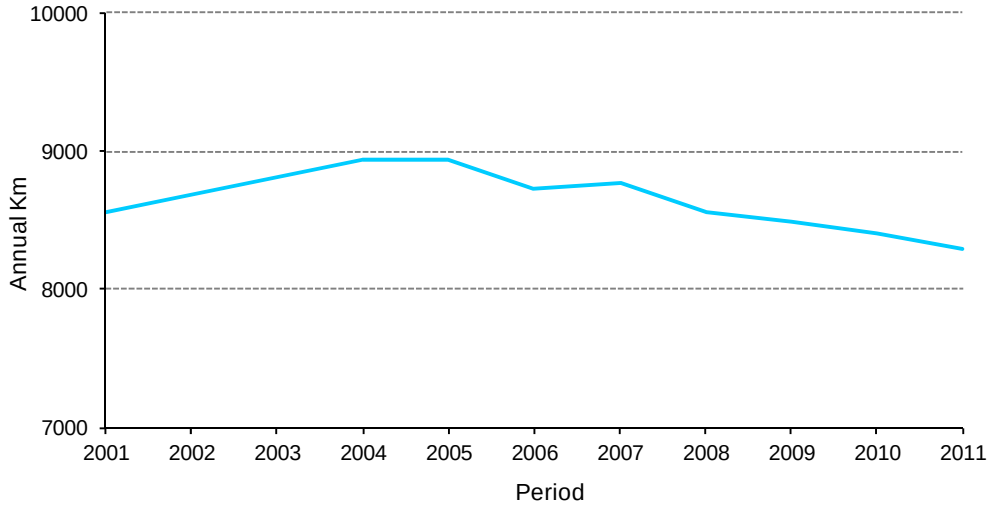


[4] Population data obtained from the Statistics New Zealand website www.stats.govt.nz.

This page will be updated in August 2013 when more accurate travel estimates for 2012 are available.

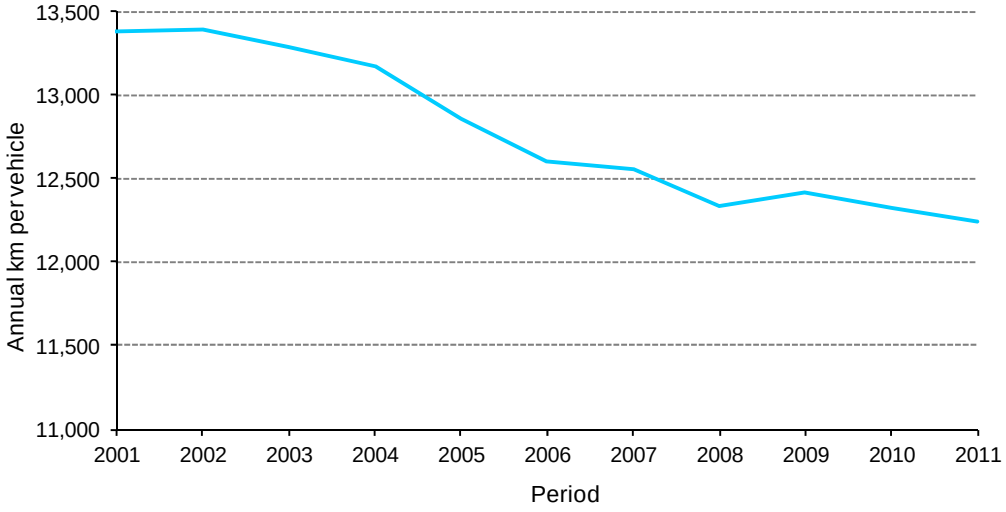
The increased ownership rate up to 2005 was accompanied by increased travel per capita. Light travel per capita (and fleet travel) dropped in response to the fuel price surges in 2006, rose slightly in 2007 and has continued to drop since then. This reflects that travel has remained largely static since 2007 (see Figure 1.4) while the population has grown.

Figure 1.6 : Light fleet travel per capita



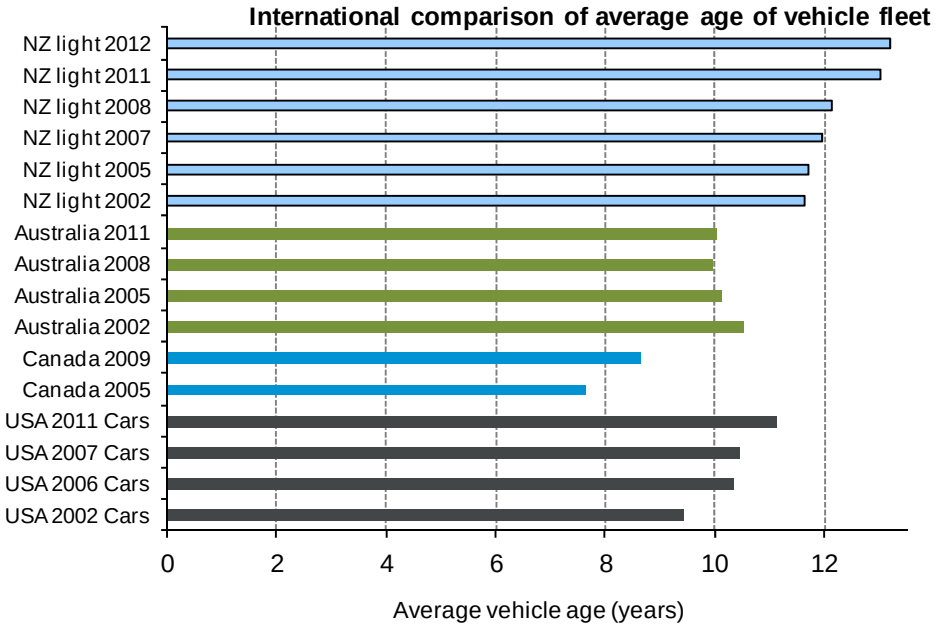
The very high level of vehicle ownership (see Figure 1.5) does not translate proportionately into increased travel. The amount of travel per light vehicle declined during each year since 2002, with the exception of 2009. It rose in 2009 after the drop in 2008, which was associated with an oil price spike. Part of this decline is due to the increase in vehicles per capita from 2000 to 2005. (Also see Figures 1.5 and 1.6)

Figure 1.7 : Light fleet average annual travel per vehicle



HOW DOES THE AGE OF THE NEW ZEALAND FLEET COMPARE INTERNATIONALLY?

This comparison has been confined to countries with high levels of motorisation, and with similar patterns of development to New Zealand. The United Kingdom has not been included as its motorisation level is comparatively low.



Source : USA Polk, Canada Derosiers, Australia Bureau of Statistics

LIGHT PETROL FLEET FUEL ECONOMY

This page will be updated in August 2013 when more accurate travel estimates for 2012 are available.

The economy of the light petrol fleet has been estimated by comparing the travel of the light petrol fleet with petrol deliveries, less estimated other uses of petrol.

The fuel that has been removed from the calculation is:

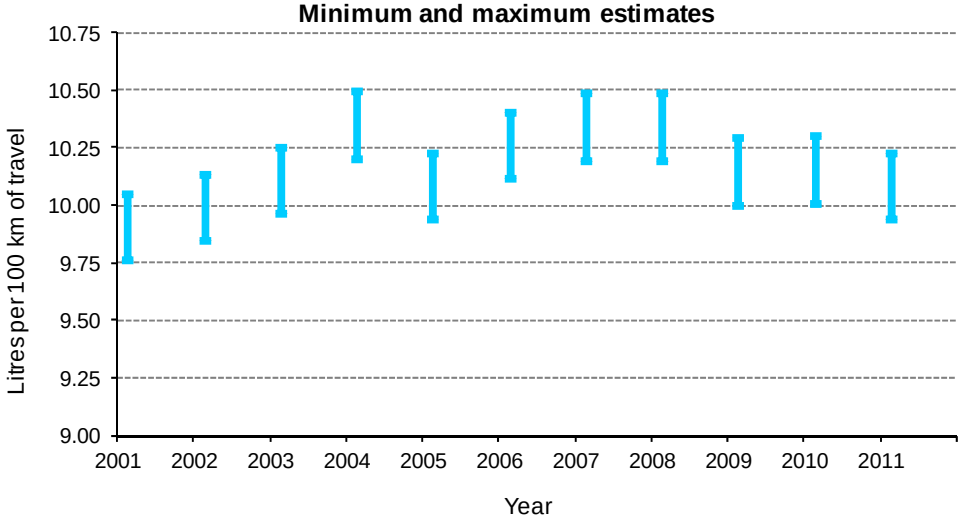
- fuel used on-road by other parts of the fleet (motorcycles, heavy goods and buses), which is estimated as 0.97 percent of petrol deliveries[5]
- fuel used off-road (boats and jet skis, lawnmowers, circuit racing, rallying, speedway, motocross and other off-road motorcycling and agricultural quad bikes), which is estimated as 3.7-4.7 percent of petrol deliveries[6]

The bars on the chart in Figure 1.9 show the petrol economy estimates, which are based on the minimum non-light fleet estimate (4.7 percent of petrol) and maximum non-light fleet estimate (5.7 percent of petrol).

The resulting rates are indicative of what happens on New Zealand roads in New Zealand driving conditions. These values are higher than the vehicle fuel test cycle values shown in Section 9, which are based on European and Japanese laboratory test cycles.

The graph indicates that real work petrol economy has only improved slightly in recent years, despite the entry of more fuel efficient vehicles into the fleet (also see Section 9).

Figure 1.9 : Light petrol fleet fuel economy 2001-2011
Minimum and maximum estimates



[5] Ministry of Transport Vehicle Fleet Emissions Model.

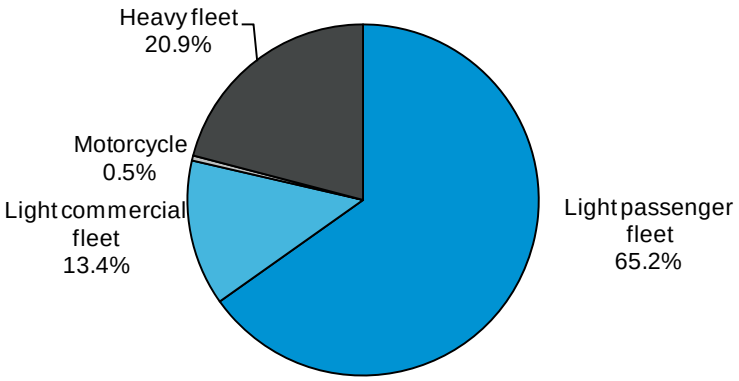
[6] Detailed in the accompanying data spreadsheet, see the research tab at www.transport.govt.nz.

VEHICLE FLEET CO_2 EMISSIONS

This page will be updated in August 2013 when more accurate travel estimates for 2012 are available.

Vehicles produce CO_2 in direct proportion to the amount of fuel used. Modern vehicles are typically engineered to reduce their harmful emissions, and sometimes this is confused with their CO_2 emissions. CO_2 emissions are purely a product of the fuel consumed, and are not affected by any controls a vehicle has to reduce harmful emissions (such as fine particulates, NOX, carbon monoxide, volatile organics and hydrocarbons).

Figure 1.10 : 2011 CO_2 emissions



Source : Vehicle Fleet Emissions Model

2. COMPOSITION OF THE FLEET

NEW ZEALAND NEW AND USED IMPORTED VEHICLES

Used imported vehicles make up a large proportion of the light vehicle fleet. Figure 2.1 shows their share reached almost 50 percent in 2006 before dropping. The share declined recently due to the decrease in imports of used vehicles.

Figure 2.2 shows the used import share of the bus and truck fleet is also dropping. The used imported segment of the bus and truck fleets was growing faster than the used imported segment of the light fleet. This growth has ceased since the 2007 Vehicle Exhaust Emissions Rule effectively prevented the import of older used diesel vehicles. There have also been increased sales of new buses since 2007 (see Figure 5.1d).

Figure 2.1 : Light fleet composition

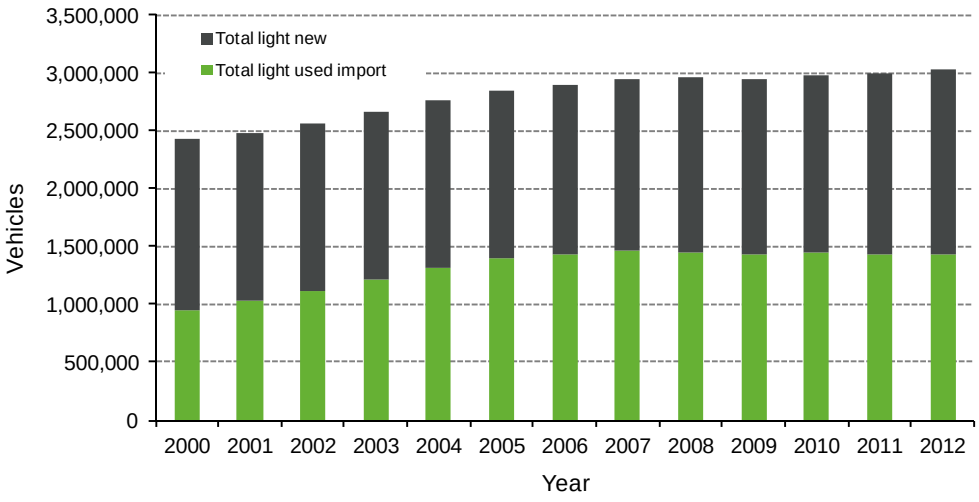
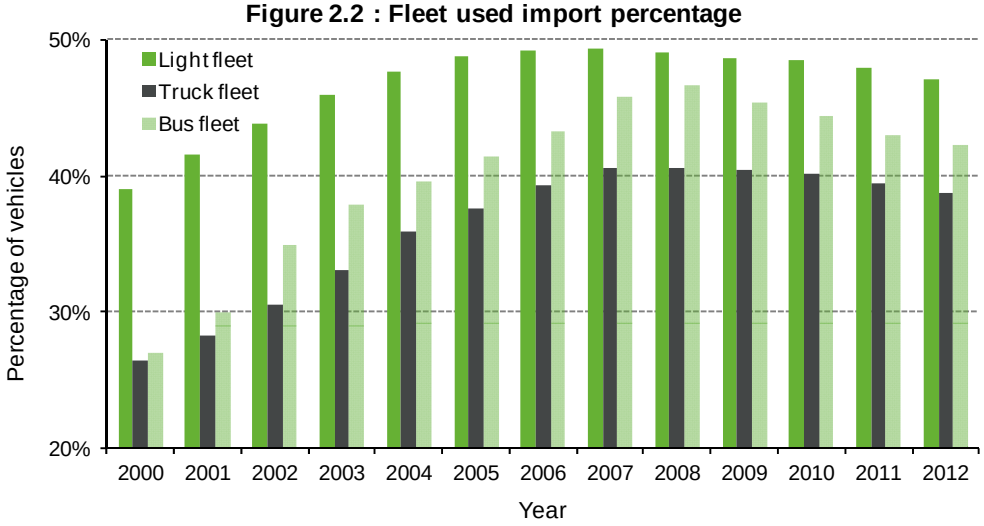


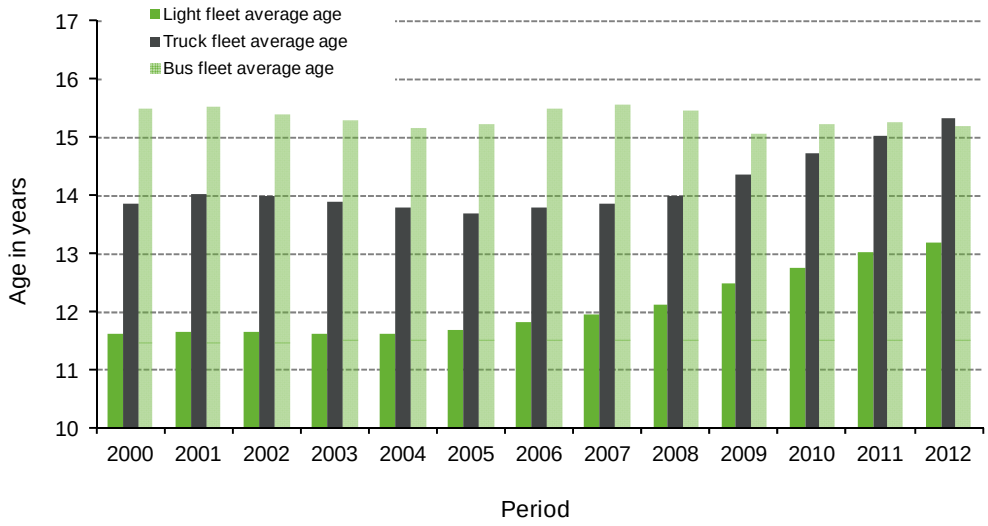
Figure 2.2 : Fleet used import percentage



AVERAGE VEHICLE AGE

The average age of the light fleet and the truck fleet have been increasing in recent years. This is not isolated to New Zealand and one possible influence is improved mechanical reliability leading to vehicles lasting longer. The average age of the bus fleet has dropped slightly in recent years in response to increased new vehicle purchasing (see Figures 2.8a and 5.1d).

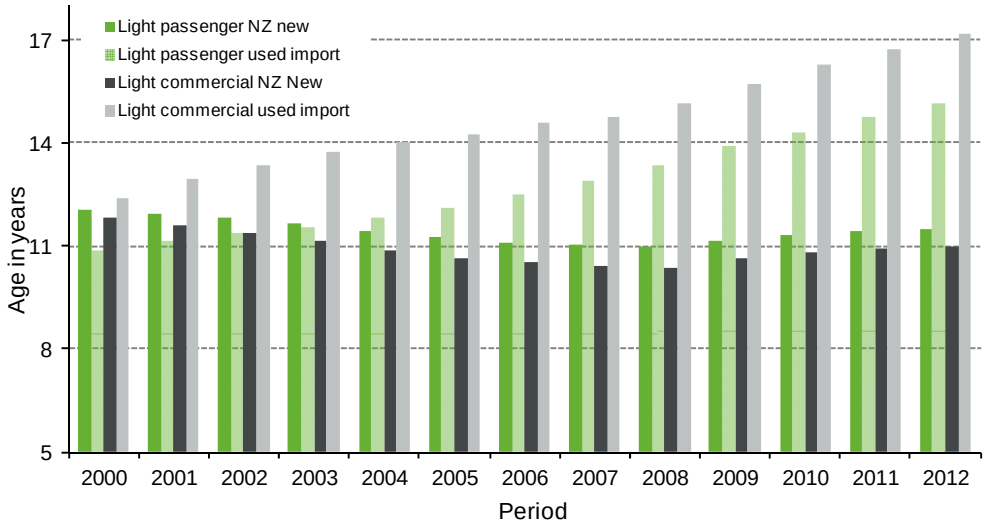
Figure 2.3 : Fleet average age



The average age of the vehicles in the light fleet is high by international standards (see Figure 1.8). Figure 2.4 shows that the average age of the used imported vehicles in the fleet is increasing, and that the average age of the NZ new light vehicles in the fleet is remaining about the same.

The aging of the light vehicle fleet is discussed in a separate report[7].

Figure 2.4 : Light fleet average age



[7] Aging of the New Zealand light vehicle fleet, May 2011, http://www.transport.govt.nz/research/othertransportresearch/agingofnzlightvehiclefleet/

LIGHT FLEET YEAR OF MANUFACTURE

The light vehicle fleet age mix includes a significant number of used imports manufactured in the mid 1990s.

The 1996 year of manufacture peak in the New Zealand fleet is in part a consequence of the Frontal Impact Standard[8], which had the effect of restricting used car imports to those vehicles manufactured during or after 1996 (and some older vehicles that met the standard).

As these mid-1990s vehicles age, we expect a significant effect on the age of the fleet. The actual effect will depend on future vehicle import and scrappage patterns (also see Figure 2.5b, 2.11a and 2.11b).

Figure 2.5a : Light fleet vehicle year of manufacture Dec 2012

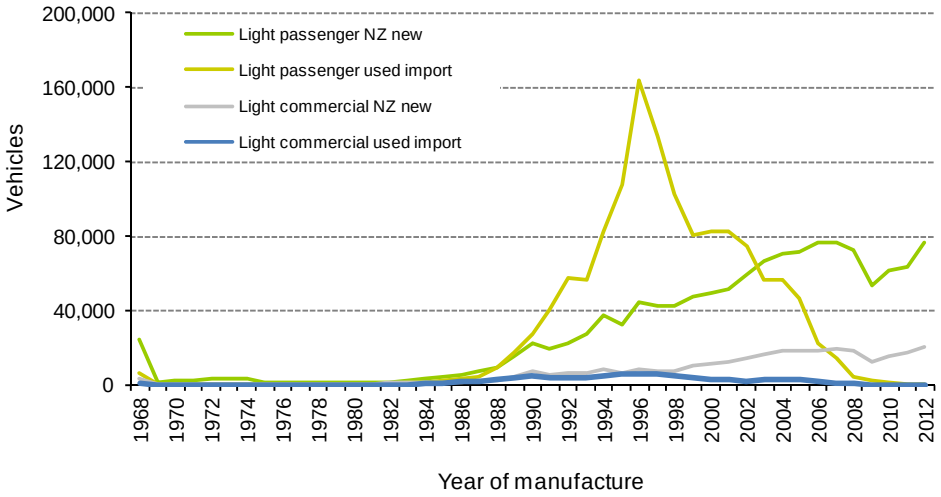
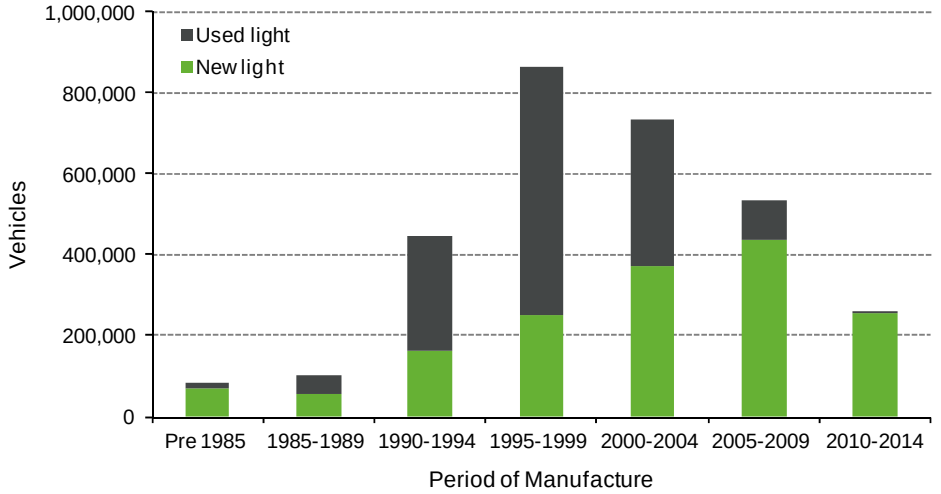


Figure 2.5b shows the relative numbers and ages of the vehicles in the light fleet. There are many vehicles manufactured in the mid 1990s in the light fleet (also see Figure 2.5a, 2.11a and 2.11b).

Figure 2.5b : Light fleet composition Dec 2012



[8] http://www.nzta.govt.nz/resources/rules/frontal-impact-2001-index.html

There is a significant difference between the make-up of the light passenger and light commercial fleets. Light commercial vehicles are typically relatively young New Zealand-new vehicles, whereas the passenger fleet is more typically older used imports.

Figure 2.5c : Light passenger fleet compostion Dec 2012

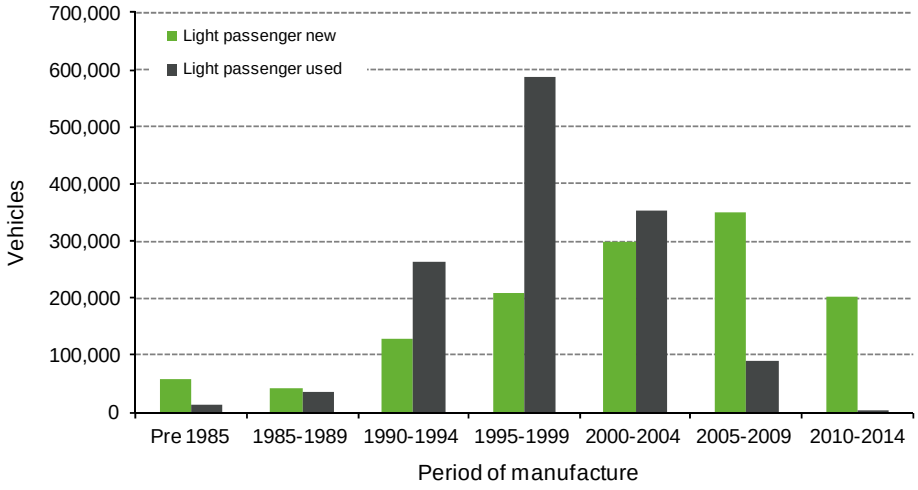
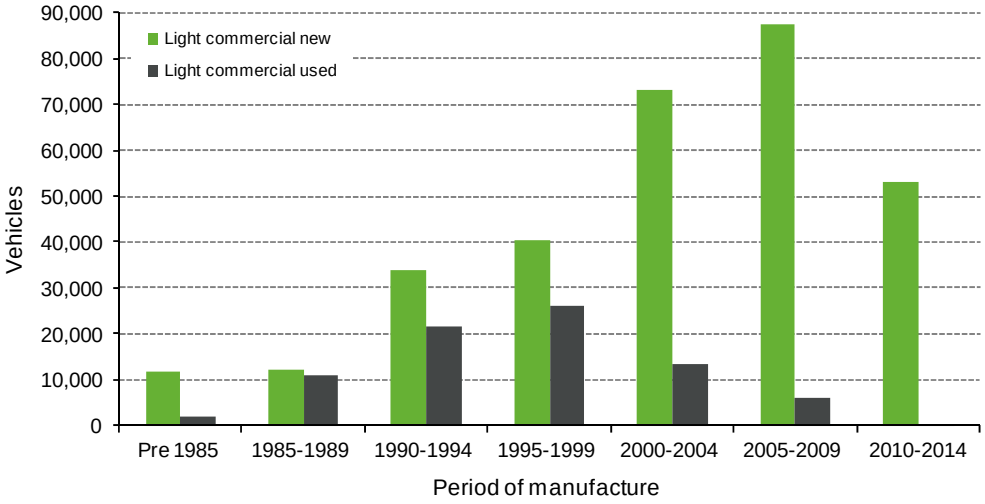


Figure 2.5d : Light commercial fleet compostion Dec 2012



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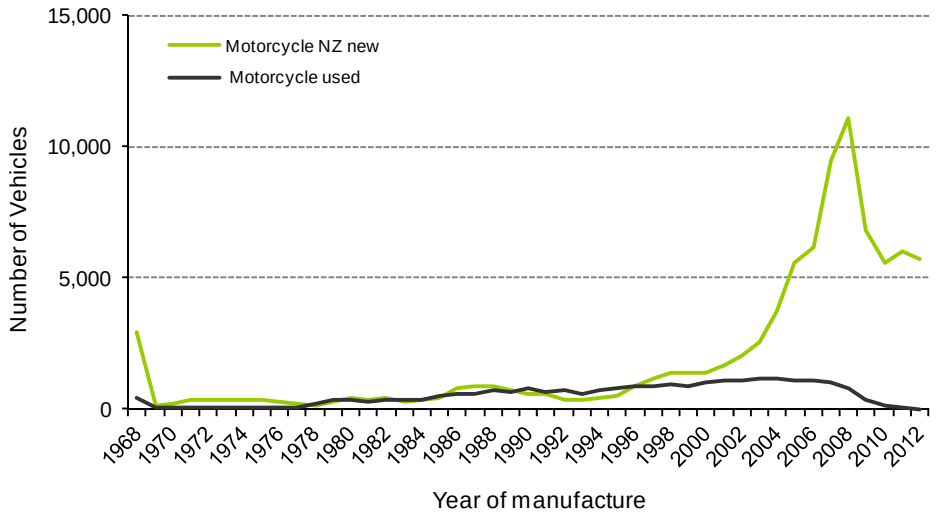
MOTORCYCLE AND MOPED YEAR OF MANUFACTURE

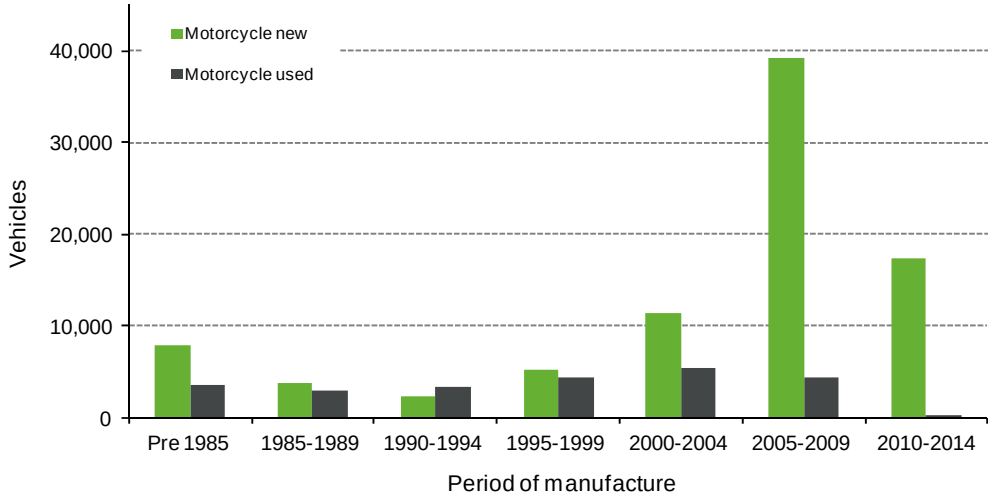
The motorcycle and moped fleet grew rapidly from 2004 to 2008 (see Figure 1.2). The age structure shown in Figure 2.6a shows that registrations peaked in 2008, and that New Zealand-new motorcycles and mopeds predominated. Also see Figure 2.6b.

Figure 2.6a : Motorcycle year of manufacture Dec 2012



Motorcycles and mopeds have been typically purchased new in recent years, although there is a higher proportion of used imports among the older bikes.

Figure 2.6b : Motorcycle fleet compostion Dec 2012



TRUCK YEAR OF MANUFACTURE

The truck age structure shows large numbers of 1990s used imports in that fleet, which is a characteristic of the light fleet as well. Also see Figure 2.7b.

The peaks in used vehicle models that were made in the mid-1990s reflected the effective banning of these vehicles in many Japanese cities for air quality reasons. This was achieved by a retrospective requirement for vehicles to meet more recent emission standards. Many owners chose to export their vehicles rather than fit aftermarket emission controls. Imports of used diesel trucks fell after 2005 (see Figure 5.1c). Used truck imports increased slightly in 2012 as used vehicles became available that met the NZ emissions requirements.

Figure 2.7a : Truck year of manufacture Dec 2012

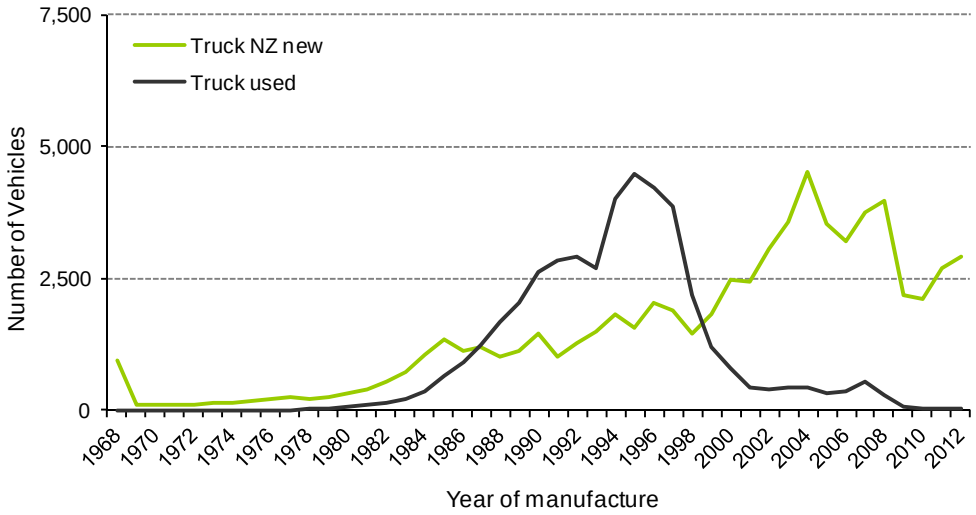
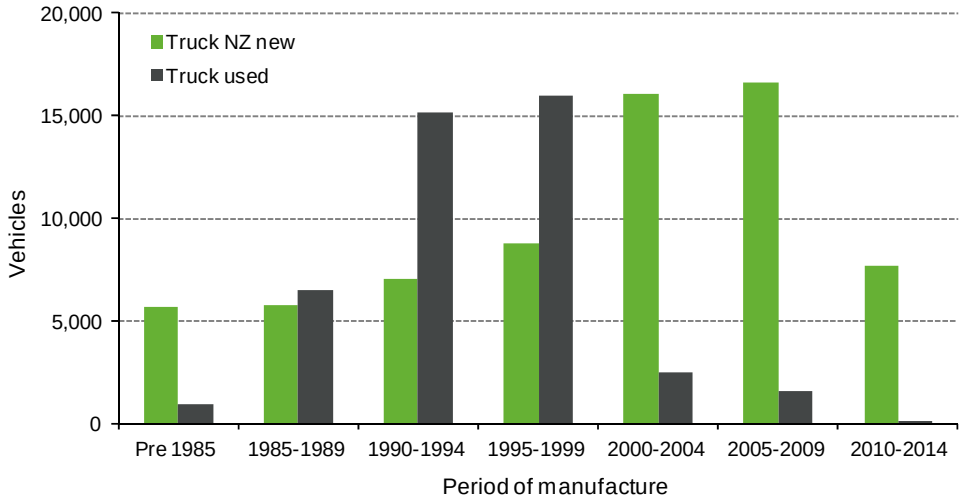


Figure 2.7b : Truck fleet composition Dec 2012



BUS YEAR OF MANUFACTURE

The bus fleet has a different age profile to the truck fleet. It has a larger proportion of older used imported vehicles manufactured in the late 1980s and early 1990s rather than the mid 1990s. There have been substantial purchases of new buses in recent years.

Figure 2.8a : Bus year of manufacture Dec 2012

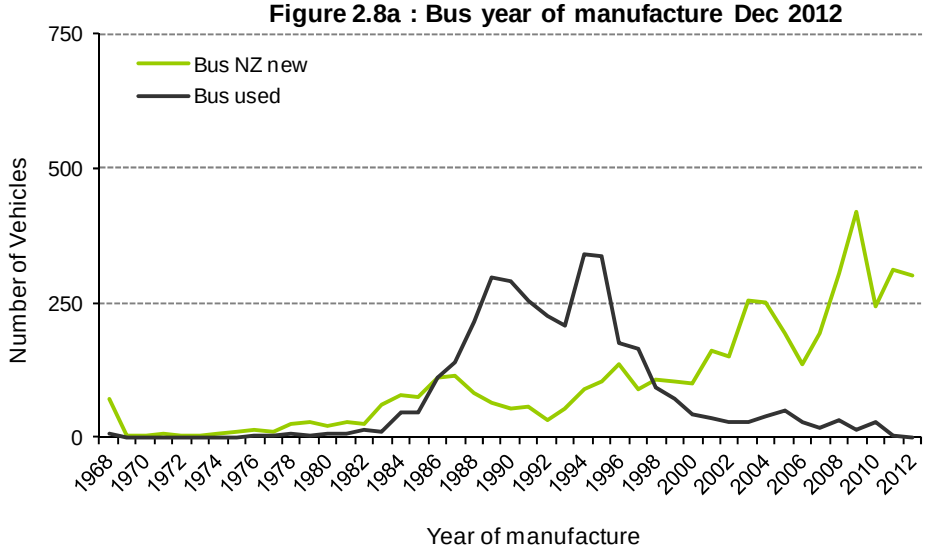
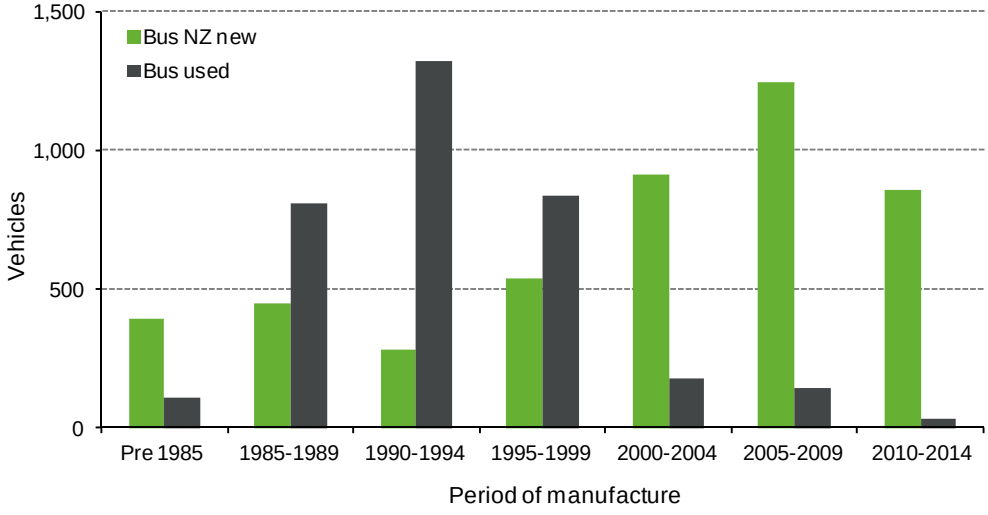


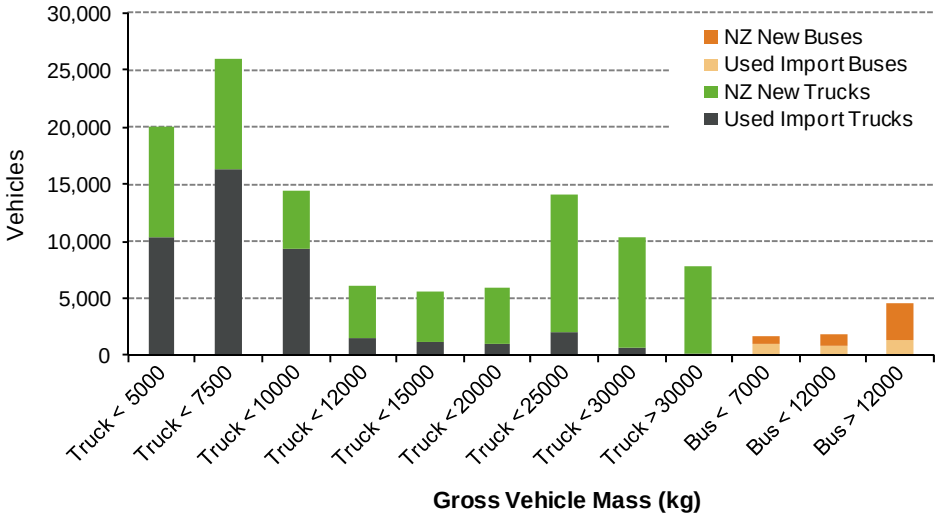
Figure 2.8b : Bus fleet composition Dec 2012



HEAVY FLEET GROSS VEHICLE MASS

The used imported vehicles in the heavy fleet are concentrated in the small to medium mass range.

Figure 2.9 : Heavy fleet mass Dec 2012



LIGHT FLEET AGE STRUCTURE

Figures 2.11a and 2.11b show how the age structure of the light fleet has changed since 2000. In 2000, 23.8 percent of the light fleet was 15 or more years old, but by 2012 this had increased to 39.6 percent. Vehicle replacement volumes dropped significantly from 2008 and the effect can be seen in the levelling off of the light fleet size (see Figure 2.11a), and the increased proportion of older vehicles (see Figure 2.11b).

In December 2012 the proportion of the light fleet that was 15 years old or older had risen to nearly 40 percent. It was only 27 percent five years earlier, in December 2007. It is expected that many of these older vehicles will require replacement in the next five years, and given the economic outlook and tightened availability of credit, it is possible that vehicles per capita will decline and the fleet size could drop.

The light fleet size increase in 2012 was partially due to a drop in the number of vehicles leaving the fleet (see Figures 5.1a and 7.2c), but the increasing age of the used import light fleet (see Figure 2.4) means that low level will not continue indefinitely.

Figure 2.11a : Light fleet age structure

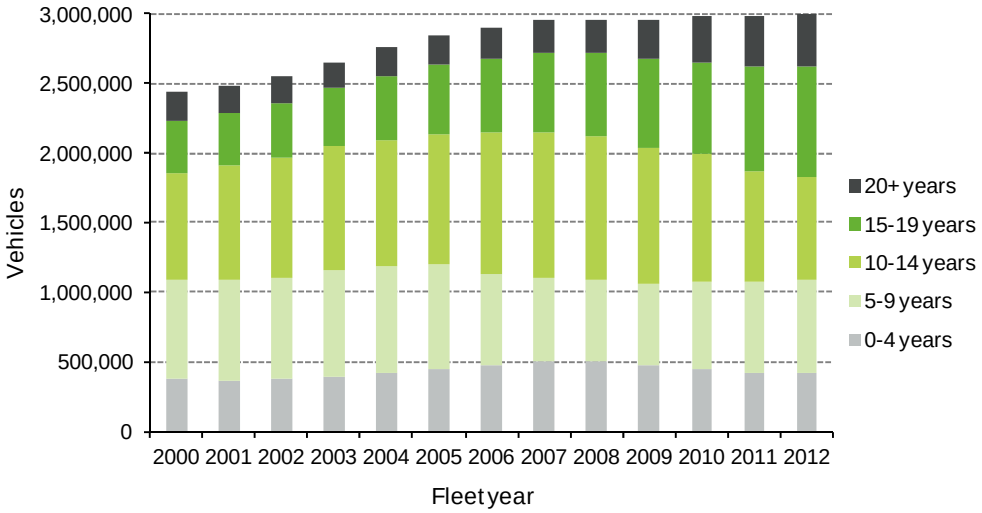
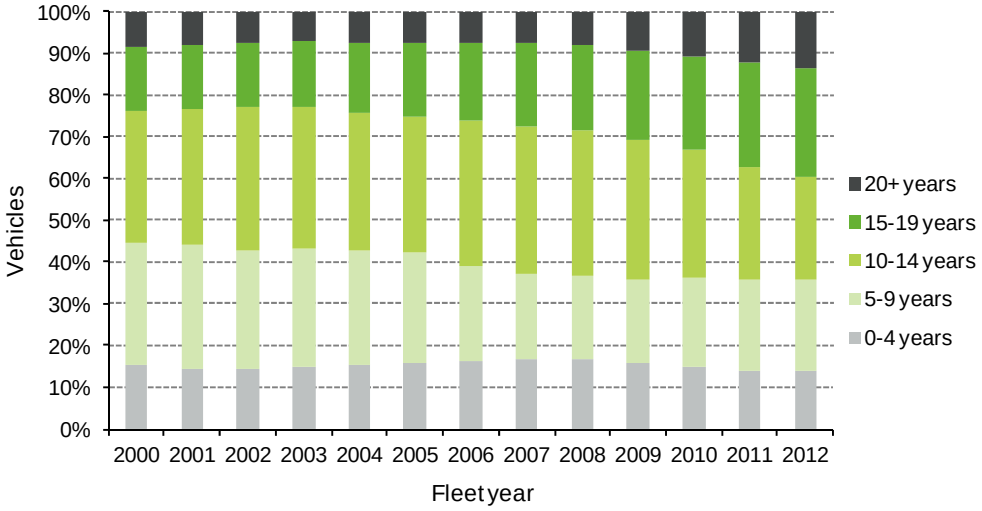


Figure 2.11b : Light fleet age structure

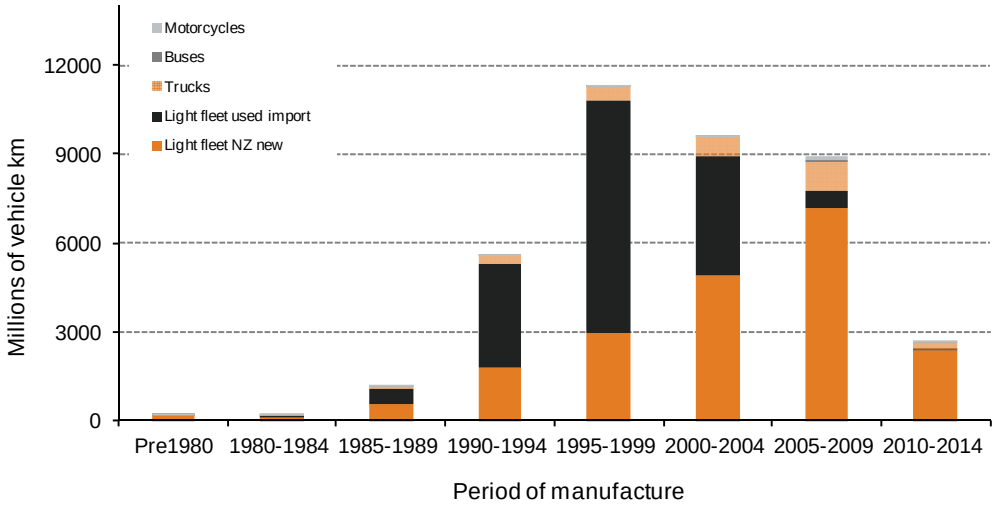


3. VEHICLE TRAVEL AND AGE

This page will be updated in August 2013 when more accurate travel estimates for 2012 are available.

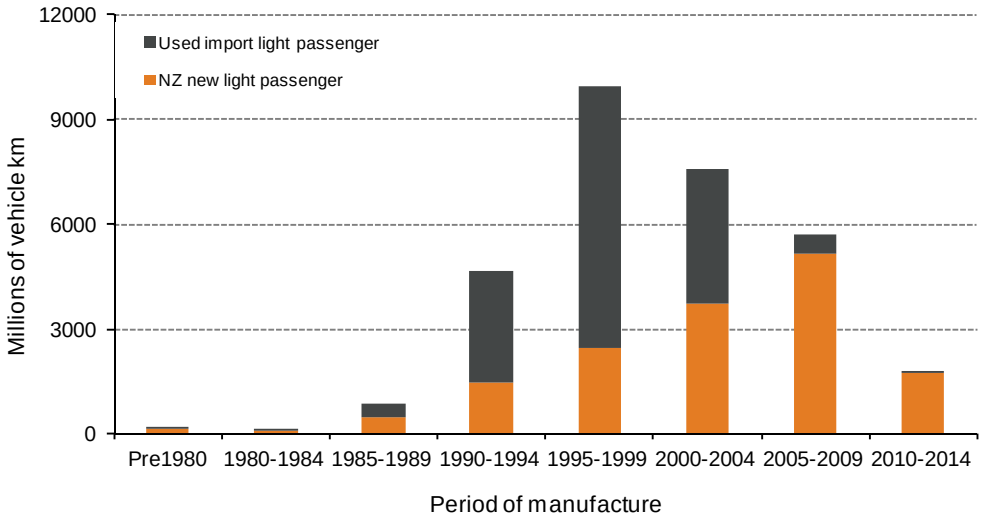
The breakdown of travel is shown in Figure 3.1. A substantial proportion of travel is by light used imported vehicles manufactured during the 1990s (also see Figures 2.5b and 3.2a).

Figure 3.1 : Fleet travel in 2011



Light passenger vehicle travel makes up the majority of travel. A significant component of this travel is done by used imported vehicles manufactured during the mid 1990s.

Figure 3.2a : Light passenger fleet travel in 2011

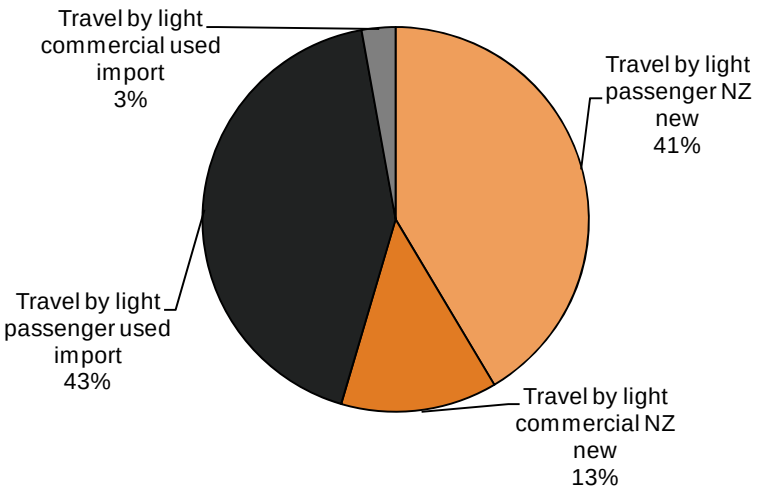


This page will be updated in August 2013 when more accurate travel estimates for 2012 are available.

New Zealand-new light vehicles do more travel than used imported light vehicles (see Figure 3.5).

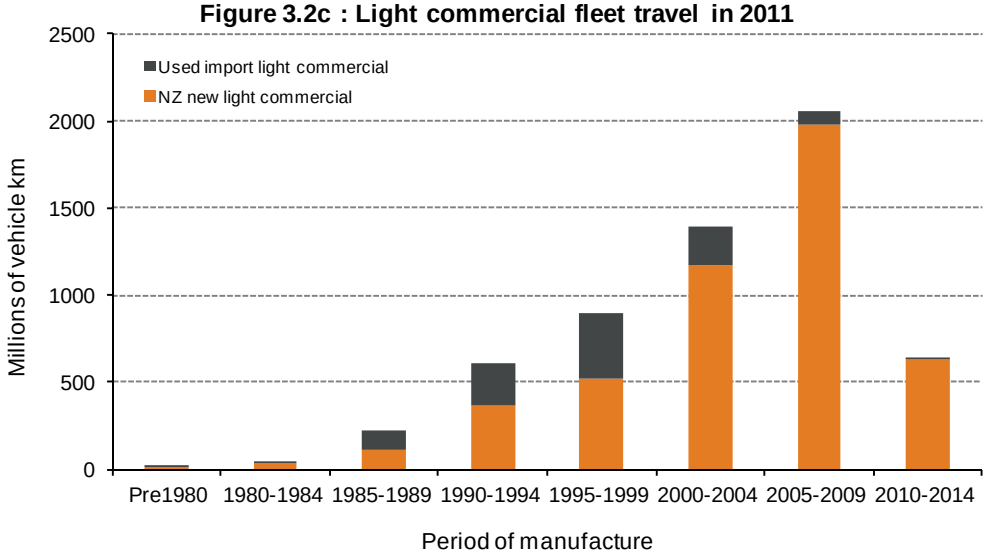
New Zealand-new light commercials do substantially more travel than used import light commercials, whereas used imported light passenger vehicles do slightly more travel than New Zealand-new light passenger vehicles (see Figure 3.2c for light commercial fleet travel and Figure 3.1 for a breakdown of total travel by vehicle age).

Figure 3.2b : Light private fleet travel 2011



Light commercial travel shows a different pattern from the fleet as a whole A far higher proportion of travel is done by recently purchased New Zealand-new vehicles (also see Figure 2.5c).

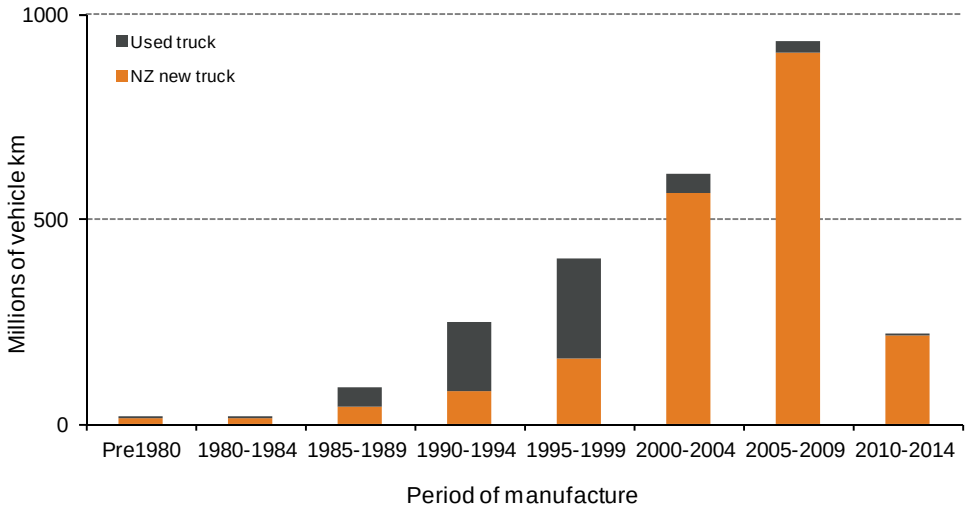
Figure 3.2c : Light commercial fleet travel in 2011



This page will be updated in August 2013 when more accurate travel estimates for 2012 are available.

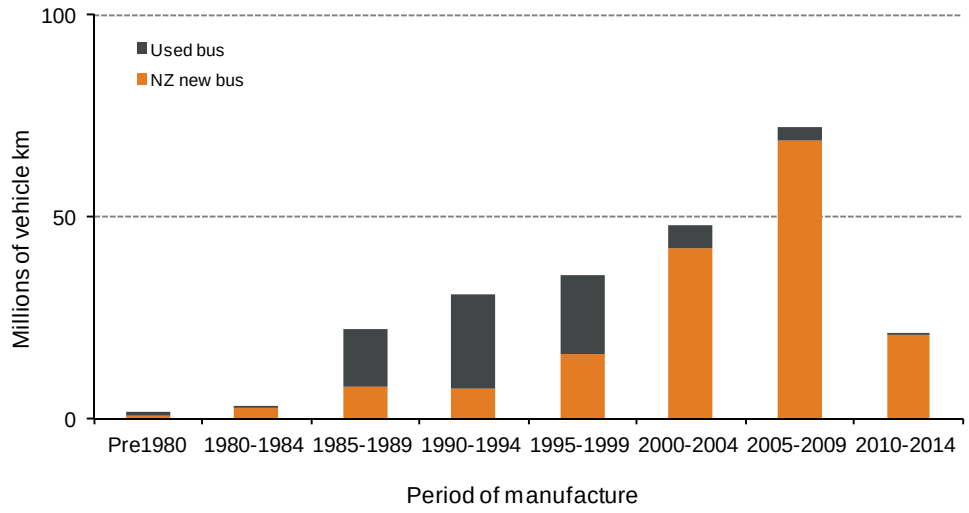
Half of all the travel by trucks is by New Zealand-new vehicles built after 2005, although they make up a much smaller part of the fleet then that (see Figure 2.7b).

Figure 3.2d : Truck travel in 2011



As with trucks newer buses travel the greatest distance. However a much greater proportion of bus travel is done by vehicles manufactured in the 1980s and 1990s.

Figure 3.2e : Bus travel in 2011



AVERAGE VEHICLE TRAVEL BY VEHICLE AGE

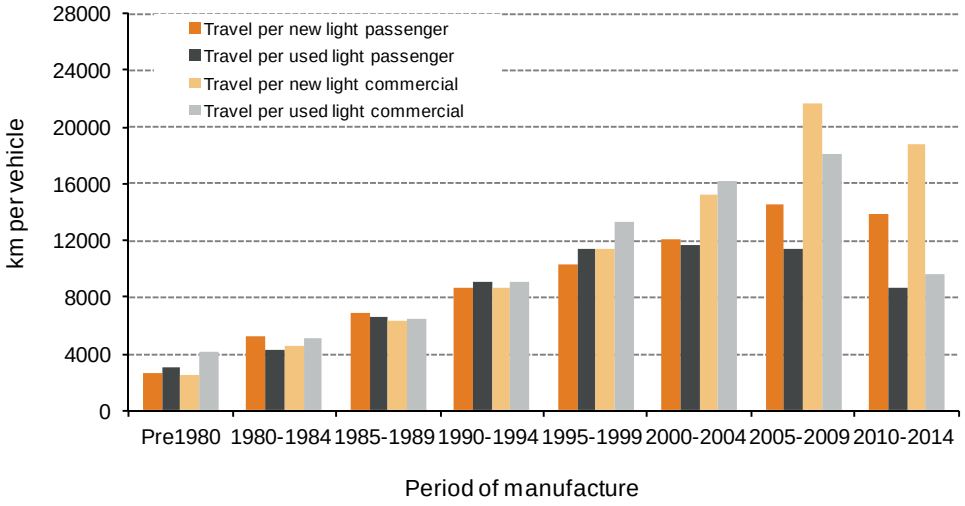
This page will be updated in August 2013 when more accurate travel estimates for 2012 are available.

There is a clear relationship between vehicle age and travel —older vehicles are not driven as far each year. The patterns of used and new light vehicle travel also vary with vehicle age.

There is a difference in travel patterns between light commercial and light passenger vehicles. Light commercial vehicles are driven further each year than passenger vehicles until they reach an age of about 15 years, after which the annual distances are similar.

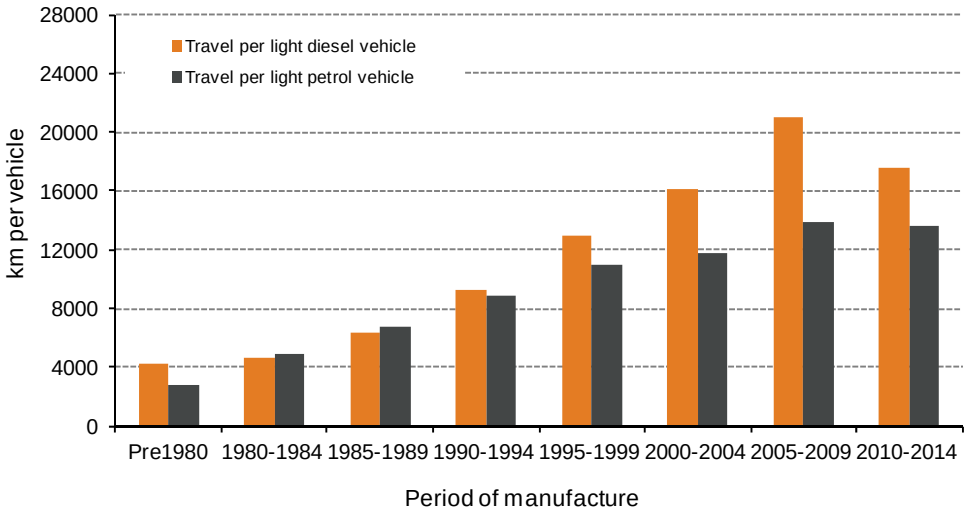
The travel by vehicles manufactured in 2011 pulls the average for 2010-2014 vehicles down, as on average they were only in the fleet for 6 months of 2011.

Figure 3.4a : Travel per light vehicle in 2011



On average diesel vehicles travel further than petrol vehicles of the same age. Many light diesel vehicles are used for commercial purposes (utes and vans) though many SUVS are diesel powered.

Figure 3.4b : Light petrol and diesel travel per vehicle in 2011



This page will be updated in August 2013 when more accurate travel estimates for 2012 are available.

Figures 3.4c and 3.4d show that buses typically travel further than trucks per year, and both travel more than light vehicles. Total travel by heavy vehicles is much less than that by light vehicles (see Figures 3.4c, 3.4d and 3.4e) as they are only a small part of the fleet (see Figure 1.1).

The travel by vehicles manufactured in 2011 pulls the average for 2010-2014 vehicles down, as on average they were only in the fleet for 6 months of 2011.

Figure 3.4c : Truck travel per vehicle in 2011

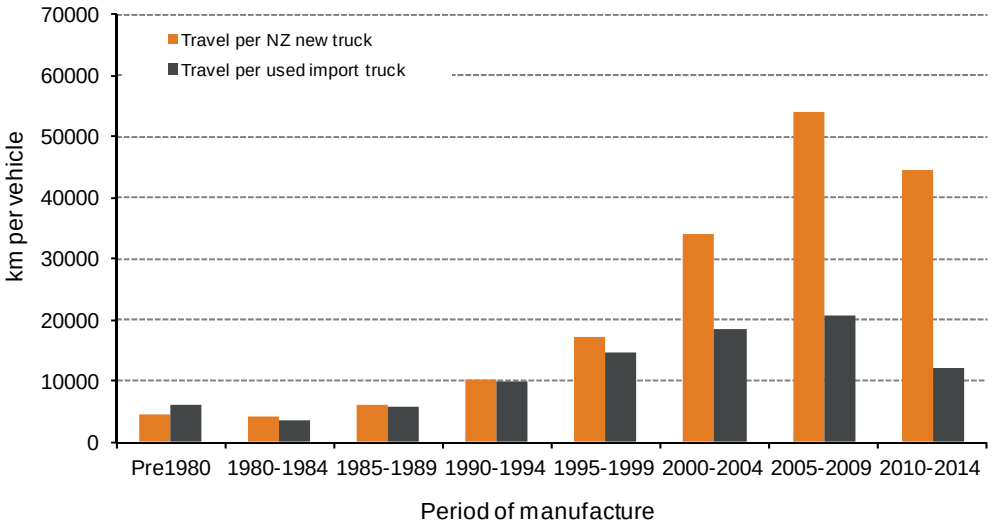
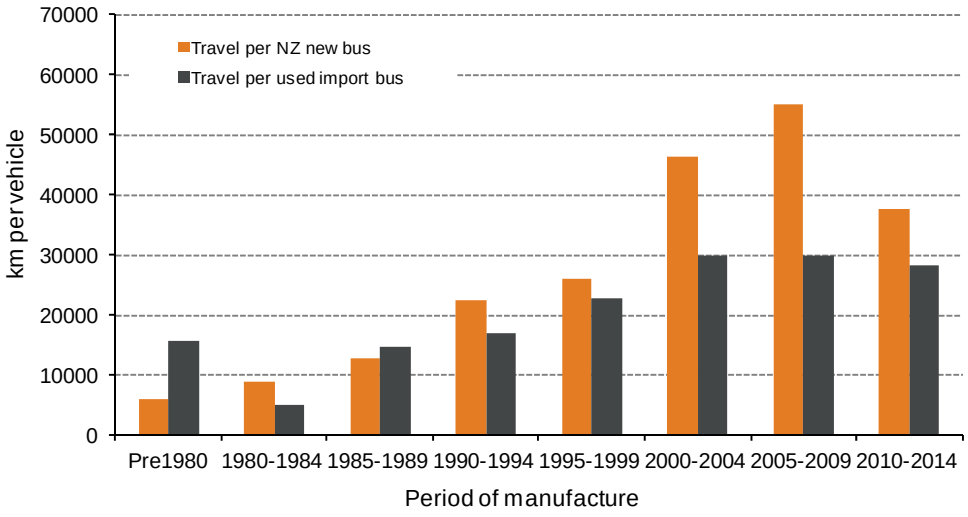


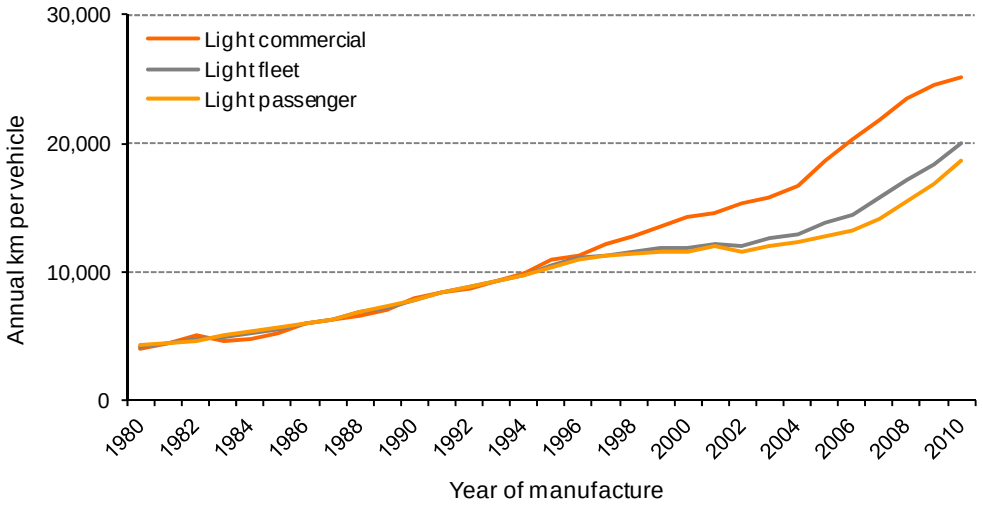
Figure 3.4d : Bus travel per vehicle in 2011



This page will be updated in August 2013 when more accurate travel estimates for 2012 are available.

Light commercial vehicles are typically driven further than light passenger vehicles early in their life. This effect starts to diminish as the vehicles age, and has disappeared by the time they are 15 years old.

Figure 3.5 Light fleet average travel in 2011, by vehicle age



4. LIGHT FLEET ENGINE CAPACITY TRENDS

The once steady month-on-month increase in average vehicle engine capacity in the light fleet this decade has almost stopped in recent years. These graphs show the averages for the vehicles in the fleet from January 2000 through to December 2012.

The New Zealand-new component of the fleet has a significantly larger average engine capacity than the used imported component. This is mainly due to Australian-made vehicles imported new into New Zealand. The increase in engine capacity has largely tailed off since 2008.

The trends in diesel and petrol engine capacities are quite different, as shown in Figure 4.1b. The capacity of New Zealand-new petrol vehicles within the fleet showed the greatest level of increase. It also shows that the average diesel engine is significantly larger than the average petrol engine.

New Zealand did not record fuel consumption data on the vehicle register before 2005. Therefore, engine capacity was previously used as a proxy for fuel consumption, but it does not take improvements in engine efficiency into account, or other factors, such as vehicle weight gain.

Figure 4.1a : Light fleet average engine capacity

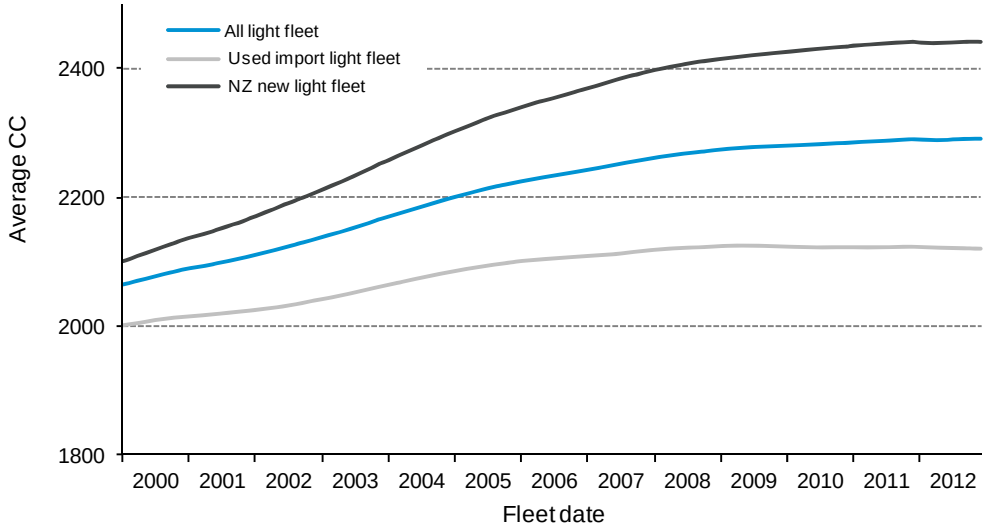
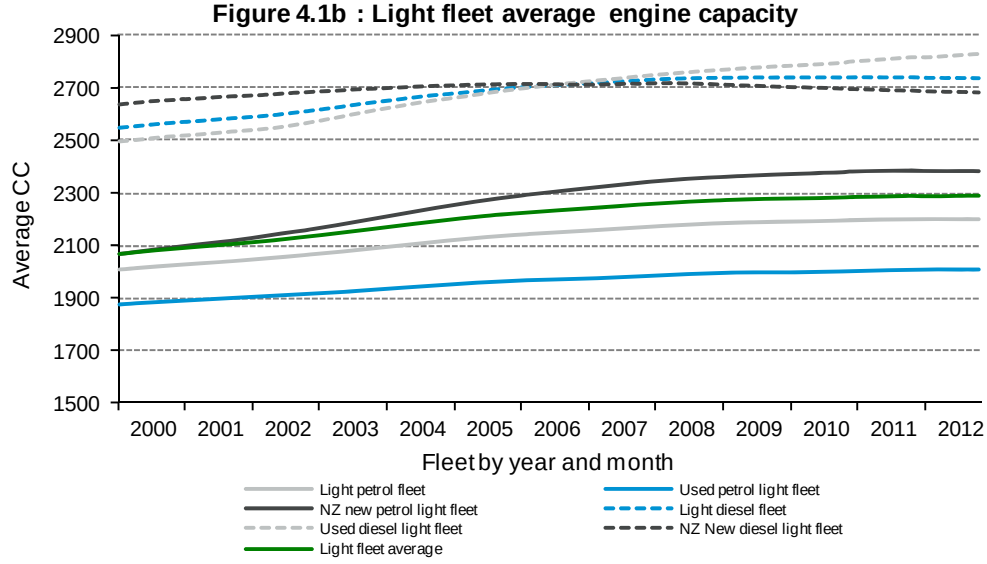
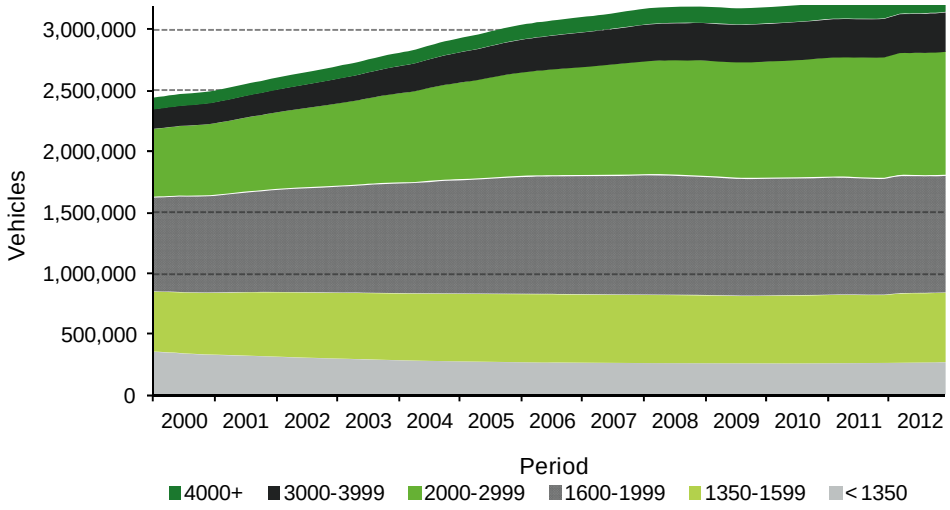


Figure 4.1b : Light fleet average engine capacity



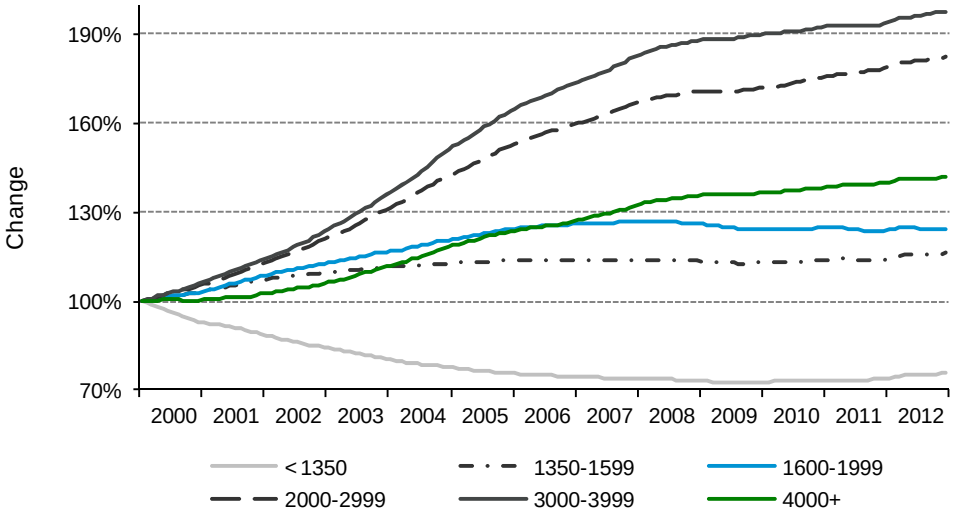
The mix of engine sizes in the light fleet has been changing. The smallest class of vehicles (under 1350cc) has declined in number, while there has been significant growth in the 2000–2999cc class.

Figure 4.2a : Light fleet engine size trend



The engine-size class that showed the greatest rate of growth is 3000–3999cc, but the number of these vehicles is relatively low. The 2000-2999cc class has shown the most growth in terms of numbers of vehicles.

Figure 4.2b : Light fleet engine size trend, relative to Jan 2000

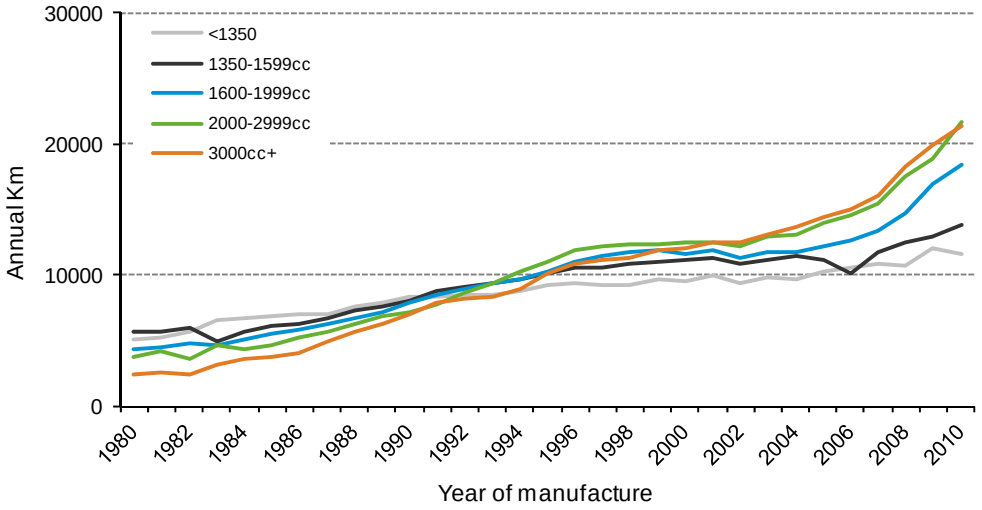


This page will be updated in August 2013 when more accurate travel estimates for 2012 are available.

LIGHT FLEET TRAVEL BY ENGINE CAPACITY AND AGE

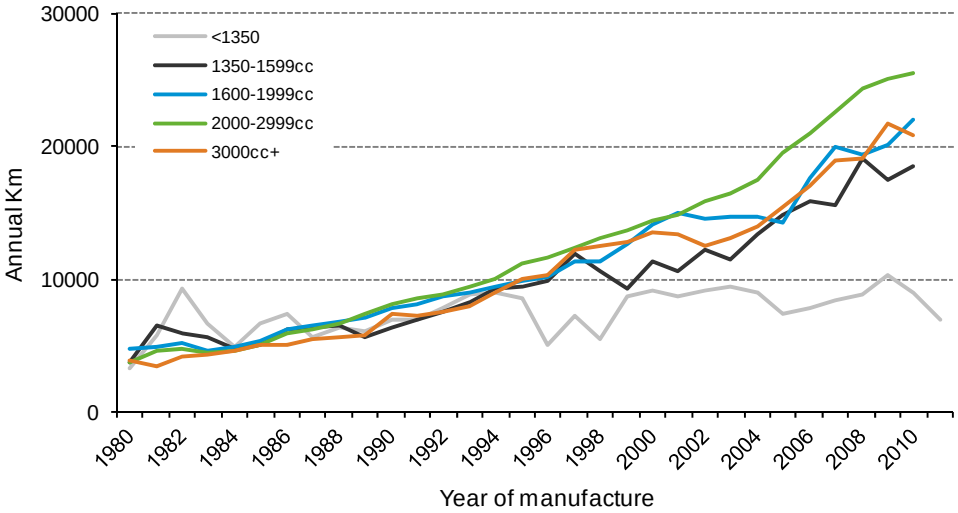
Smaller-engined vehicles do less annual travel than other vehicles, and vehicles with the largest engines travel more than other vehicles early in their life.

Figure 4.3a : Light passenger average travel 2011



The pattern for light commercial vehicles is similar to that for light passenger vehicles, although the amount of travel is far higher. Again, the vehicles with larger engines do the most travel per vehicle early in their life.

Figure 4.3b : Light commercial average travel 2011



This page will be updated in August 2013 when more accurate travel estimates for 2012 are available.

LIGHT FLEET TRAVEL TREND BY ENGINE CAPACITY

Table 1 provides a different view of travel and engine capacity. The proportion of travel done by vehicles with engine sizes of 2000cc or more grew significantly between 2001 and 2007, but has only changed slightly since then.

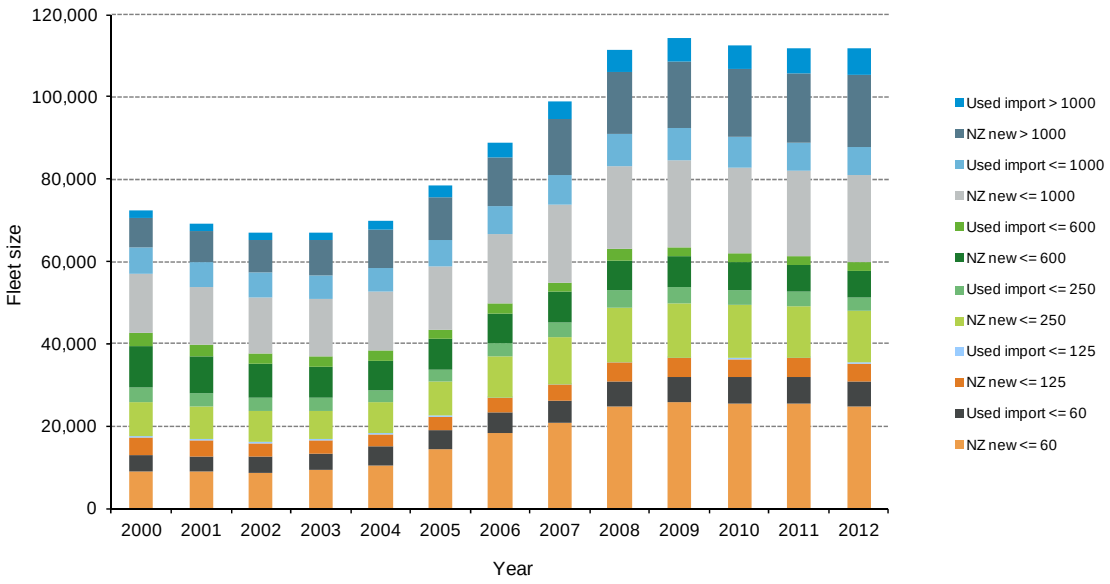
Table 1 Light Fleet travel (millions VKT[9])

Period	Engines under 2000cc	Engines 2000+ cc	Travel by vehicles 2000+ cc
2001	20,353	12,882	39%
2002	20,499	13,729	40%
2003	20,544	14,760	42%
2004	20,373	15,932	44%
2005	19,927	16,690	46%
2006	19,413	17,098	47%
2007	19,267	17,801	48%
2008	18,718	17,810	49%
2009	18,662	17,993	49%
2010	18,692	18,030	49%
2011	18,613	17,986	49%

MOTORCYCLE AND MOPED FLEET COMPOSITION

The motorcycle and moped fleet grew rapidly from 2004 to 2008. It has declined slightly in the last three years. The growth categories are concentrated at the extremes of the fleet — the under 60cc, under 250cc and over 1000cc groupings grew the most.

Figure 4.4 : Motorcycle fleet composition

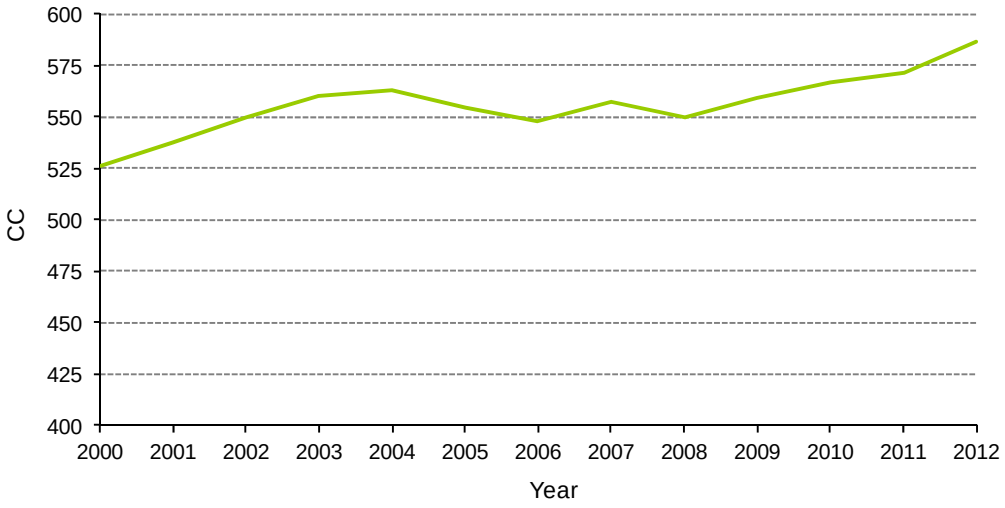


[9] Vehicle Kilometres Travelled.

MOTORCYCLE AND MOPED FLEET AVERAGE ENGINE CAPACITY

The growth in the under 60cc sector could have been expected to reduce the average engine capacity of the motor cycle fleet, but in fact the impact is quite minor because of the growth in sales of machines with very large engines. Figure 4.5 shows the average engine capacity is close to 600cc and growing (see Figure 4.4 for a detailed breakdown of the fleet composition).

Figure 4.5 : Motorcycle/moped fleet average CC



5. VEHICLES ENTERING AND EXITING THE FLEET

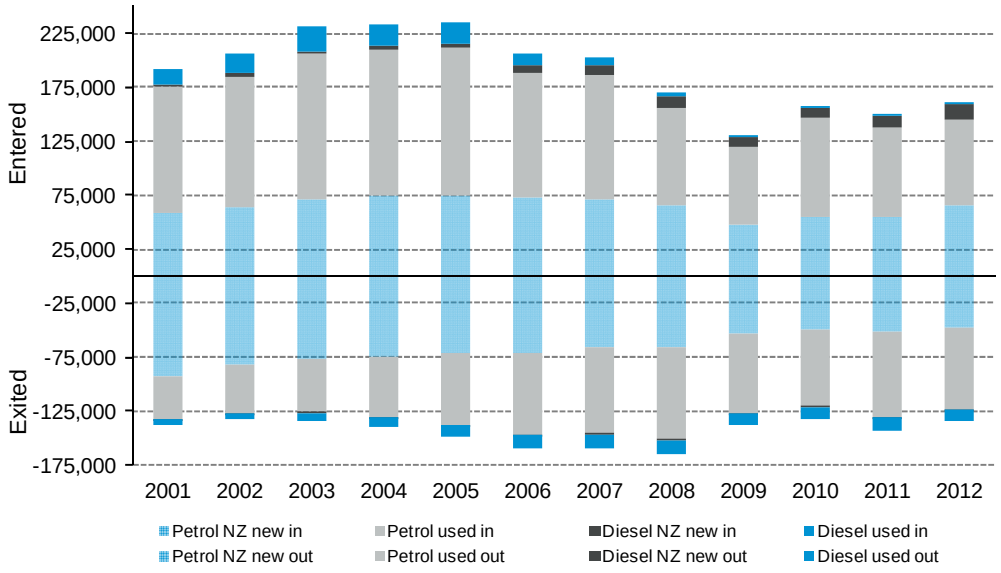
Figures 5.1a to 5.1e show the mix of vehicles that entered and exited the fleet between 2000 and 2012. The bars above zero on the vertical axis show vehicles entering the fleet, and the bars below zero show vehicles that exited.

The number of vehicles entering and exiting the light passenger fleet has dropped in recent years:

- in 2009 the fleet shrank slightly as more vehicles left the fleet than were registered
- in 2010 registrations were up and fewer vehicles left the fleet, resulting in a slight increase in the fleet size
- in 2011 registrations were slightly down and more vehicles left the fleet, but registrations exceeded the number of vehicles leaving the fleet so the fleet grew slightly
- in 2012 registrations were up and fewer vehicles left the light passenger fleet, and it grew by 26,100 vehicles. That was the largest increase since 2007, which was before the global financial crisis hit, when it grew by 43,600 vehicles

More used imports are now leaving the light passenger fleet than New Zealand-new vehicles. This reflects the vehicle mix that entered the fleet during the 1990s.

Figure 5.1a : Light passenger entry and exit



Comparing the light commercial fleet with the light passenger fleet highlights that there are very few diesel-powered vehicles entering the passenger fleet. A high proportion of the new vehicles entering the light commercial fleet are diesel powered. Businesses are again buying significant numbers of vehicles, after the drop that started in 2009.

Figure 5.1b : Light commercial entry and exit

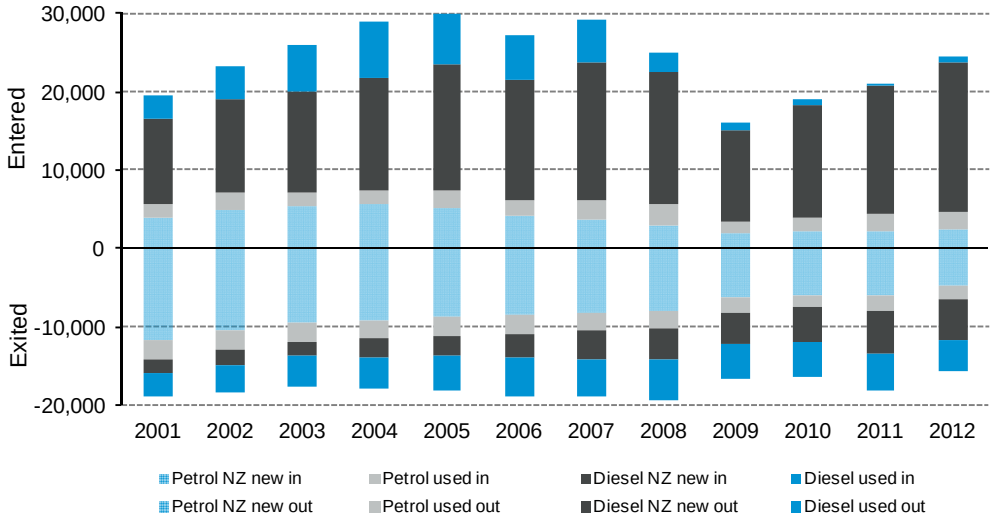
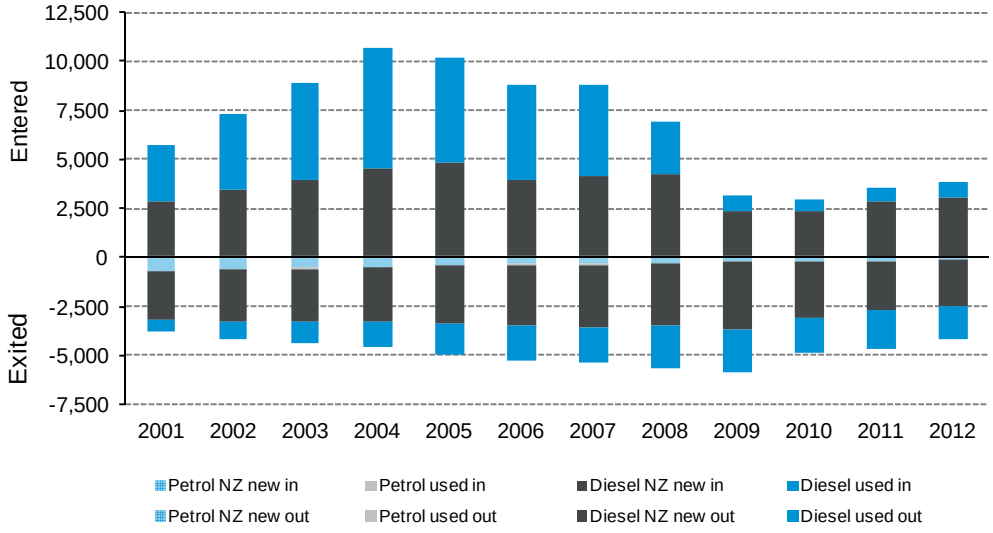


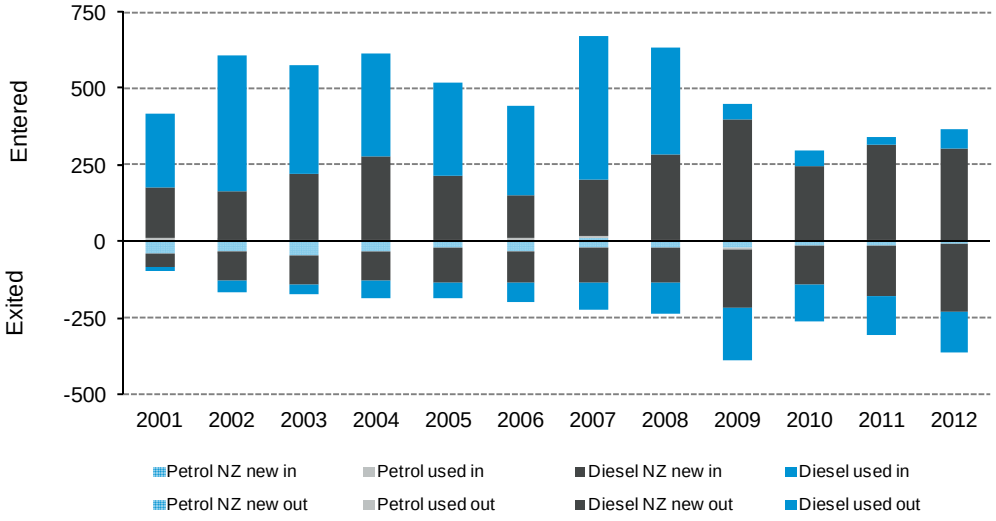
Figure 2.9 showed that used truck imports are typically lighter weight vehicles. Most of the used truck imports shown in Figure 5.1c have a gross vehicle mass under 10 tonnes (also see Figure 2.9). Used truck imports remain at low levels but have picked up a little as vehicles become available that meet our emission requirements. While purchase patterns were influenced by the rule on used truck entry and the global financial crisis, there was not the same change in disposal patterns, which have remained relatively constant.

Figure 5.1c : Truck entry and exit



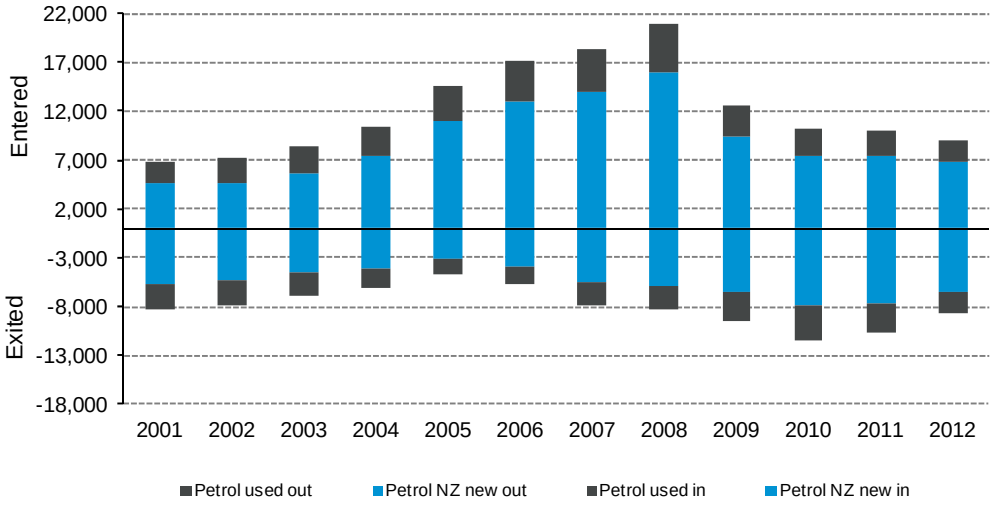
The bus fleet was expanding until 2009, and has dropped slightly since (see Figure 1.2). The majority of the buses entering the fleet until 2008 were relatively old used imports. The Vehicle Exhaust Emissions Rule effectively precluded these imports in January 2008. Bus purchase and scrapping patterns do not follow the same patterns as trucks. This may reflect that purchases are linked to government and council funding, which tends to be constant.

Figure 5.1d : Bus entry and exit



The motorcycle and moped fleet has been static since 2008, after growing significantly between 2004 and 2008 (see Figure 1.2).

Figure 5.1e : Motorcycle entry and exit

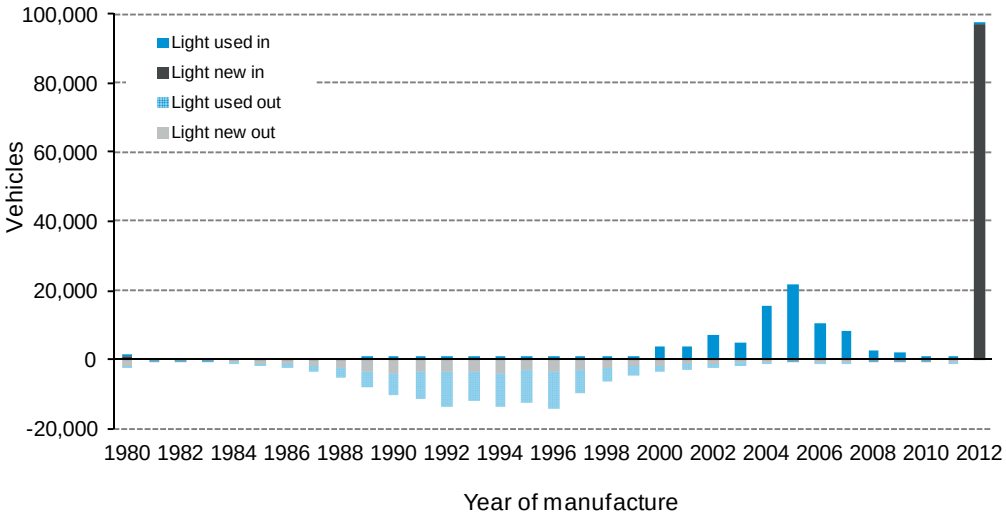


YEAR OF MANUFACTURE OF VEHICLES ENTERING AND LEAVING THE FLEET

Figures 5.2a to 5.2d show the year of manufacture of vehicles that entered and left the New Zealand light fleet in 2012. Virtually all of the new vehicles were manufactured in 2012. Figure 5.2a shows that more used light vehicles manufactured in 2005 entered the light fleet than any other age. Also see Figures 2.4, 2.5a and 6.2b.

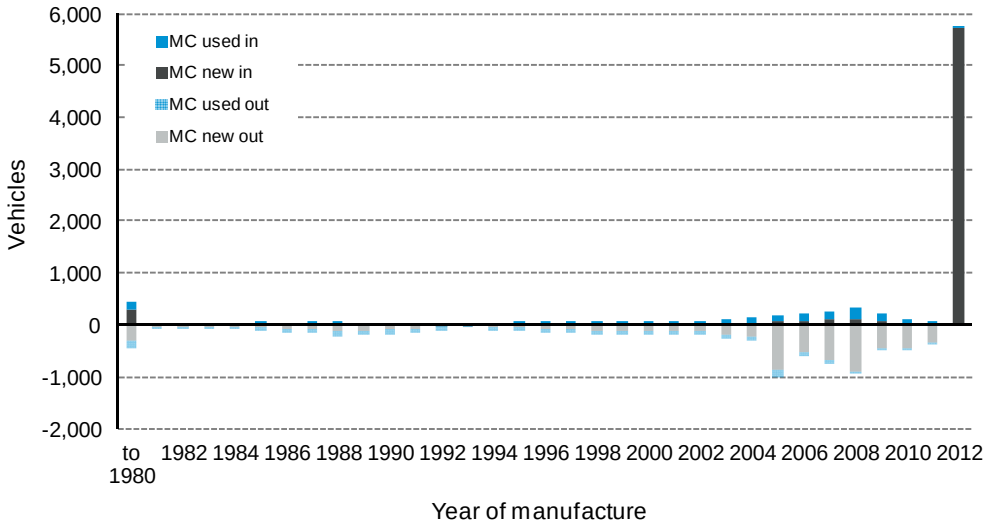
Used vehicles leave the fleet slightly earlier than New Zealand-new vehicles.

Figure 5.2a : Light vehicles entering or leaving the fleet in 2012



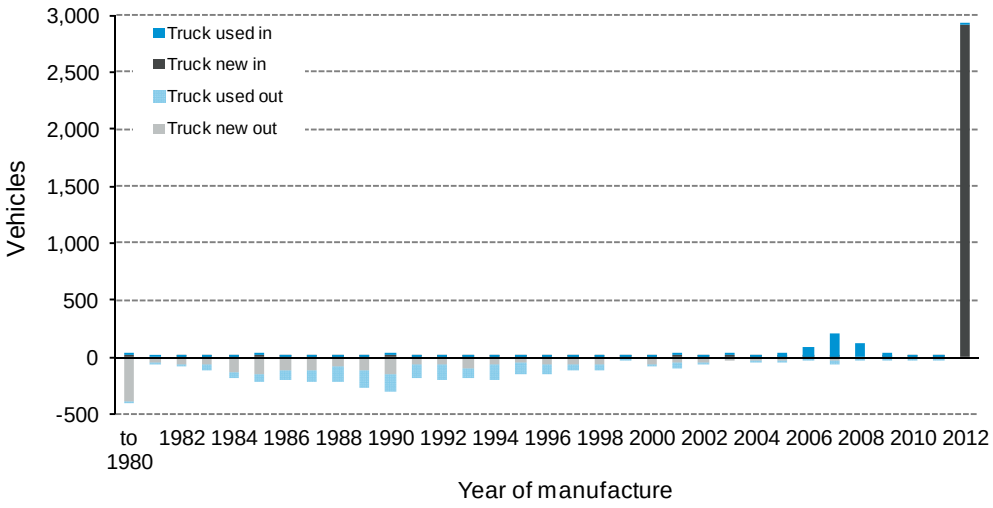
The numbers of near-new motorcycles leaving the fleet reflects the risk and severity of motorcycle crashes.

Figure 5.2b : Motorcycles entering or leaving the fleet in 2012



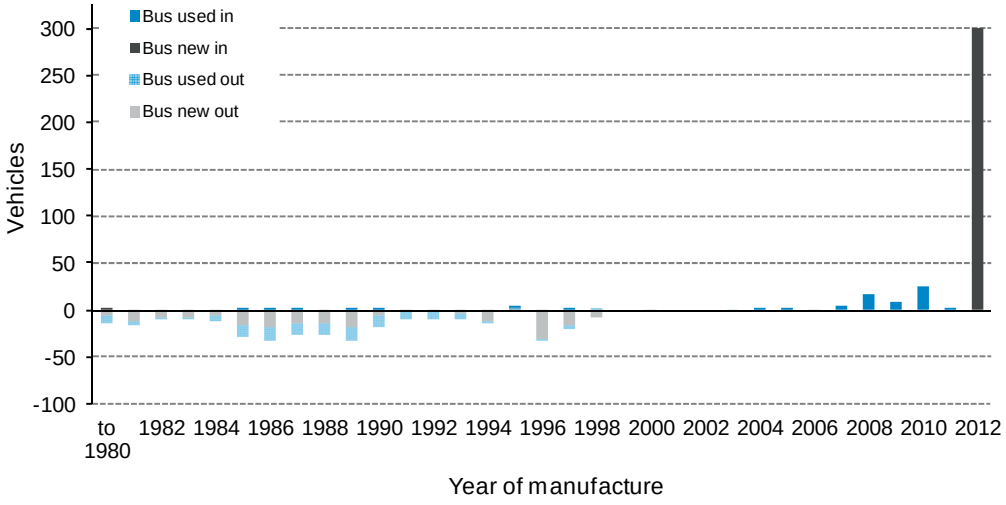
Very few used imports entered the truck fleet in 2012. Trucks leave the fleet much later than light vehicles.

Figure 5.2c : Trucks entering or leaving the fleet in 2012



Extremely few used bus imports entered the fleet in 2012. Few buses leave the fleet, which may be influenced by vehicles eventually being converted into mobile homes.

Figure 5.2d : Buses entering or leaving the fleet in 2012



ENGINE SIZE OF VEHICLES ENTERING AND LEAVING THE LIGHT FLEET

The detailed breakdowns in Figure 5.3 show the patterns of light fleet entry and exit in 2012. There are several trends in vehicle engine size growth.

- The 1500–1749 and 2000–2249 petrol classes are reducing (more vehicles left and entered).
- The 1250–1499 and 2250–2499 petrol classes are increasing.
- There are substantial numbers of 2500–2999cc diesels entering the fleet, but also now also smaller-engined diesels as well.

Figure 5.3a : Petrol vehicles entering/leaving the light fleet 2012

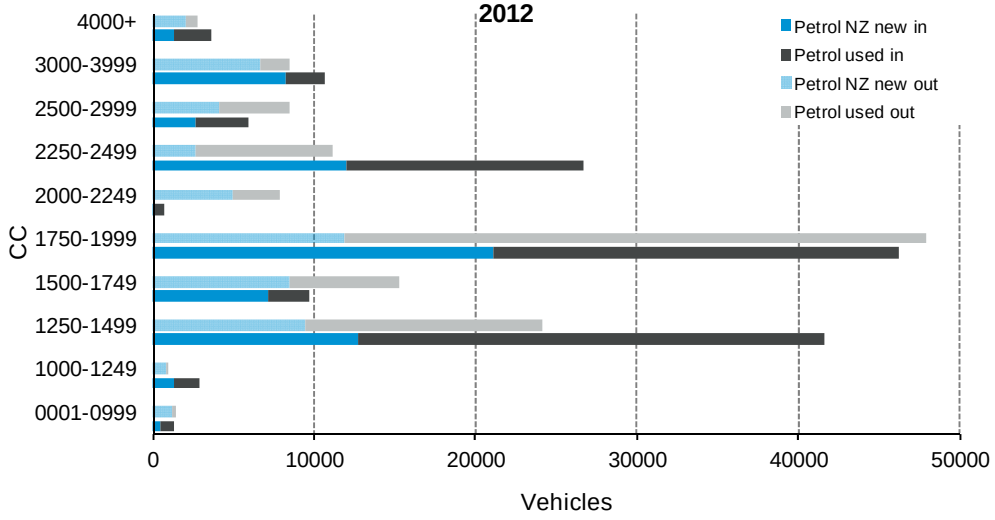
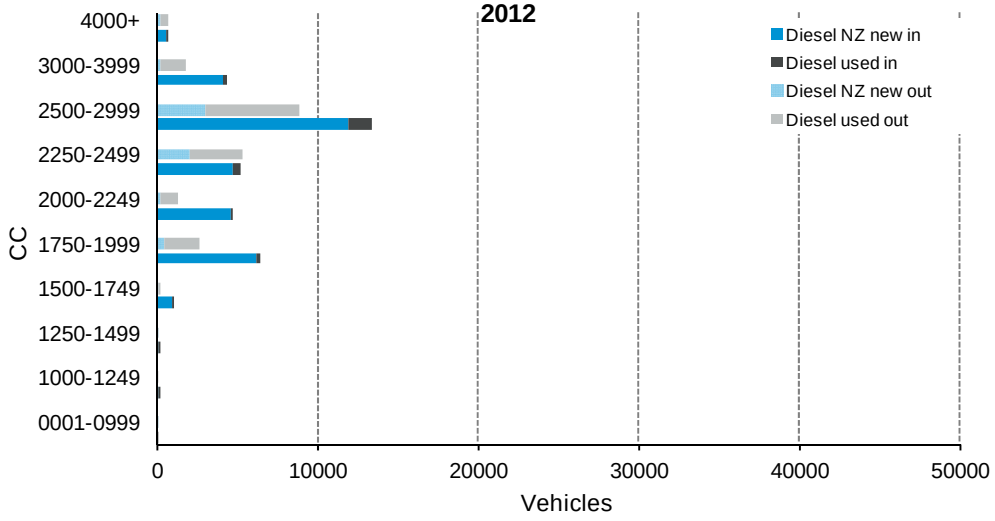


Figure 5.3b : Diesel vehicles entering/leaving the light fleet 2012

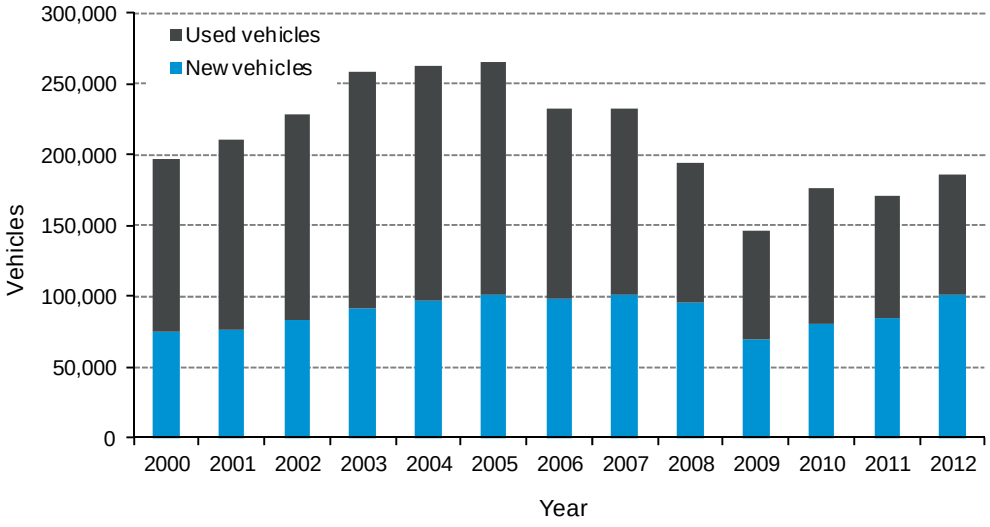


6. VEHICLES ENTERING THE FLEET

The number of light used imports registered dropped slightly in 2012, probably in response to the Vehicle Exhaust Emissions Rule, which took effect in January 2012 requiring vehicles to be built to newer standards. On the other hand registrations of new light vehicles were far higher than in recent years, back to the level of 2007. More new light vehicles were registered than used imports, which has not happened since 1996.

Although polices such as the frontal impact standard and vehicle exhaust emissions rule affect the number of used vehicles entering the fleet, factors such as the state of the economy, the exchange rate, and availability of vehicles in Japan are also important. Since 2000, other countries have imported greater volumes of used vehicles from Japan and have increased the level of competition. In 2001 New Zealanders purchased 26 percent of the 280,000 used vehicles exported, but by 2011 this had dropped to 9 percent of 707,000 exports.

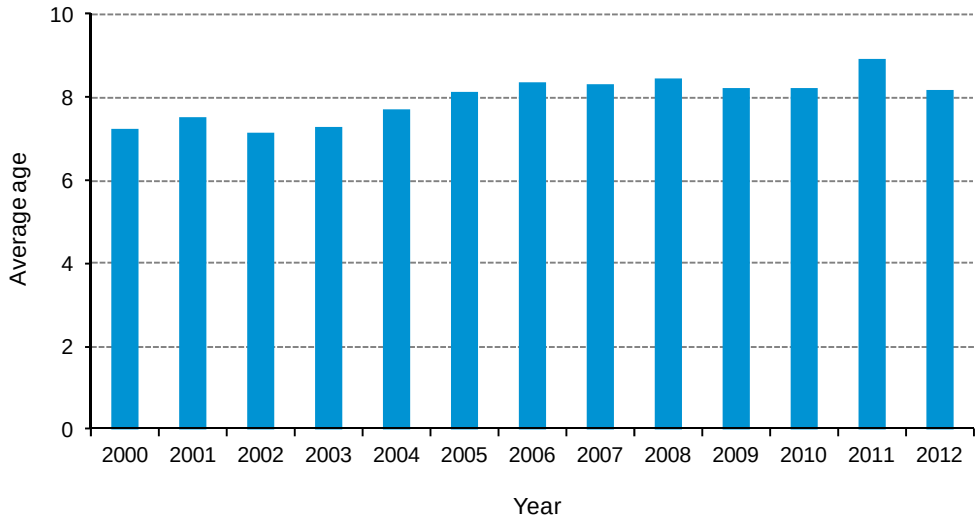
Figure 6.1 : Number of vehicles entering the light fleet



The average age of used imported vehicles entering the light fleet was increasing until 2008. The Vehicle Exhaust Emissions Rule took effect in January 2008, and required vehicles to be built to newer standards. That resulted in the average age dropping in 2009. By 2011 though, the average age of used imports entering the fleet was at an all time high. That was because older vehicles could be sourced for import, as the age range of the vehicles compliant with the rule broadened. The oldest used vehicles that could be imported in 2008 were typically manufactured in 2001, and it was still possible to import those vehicles until December 2011.

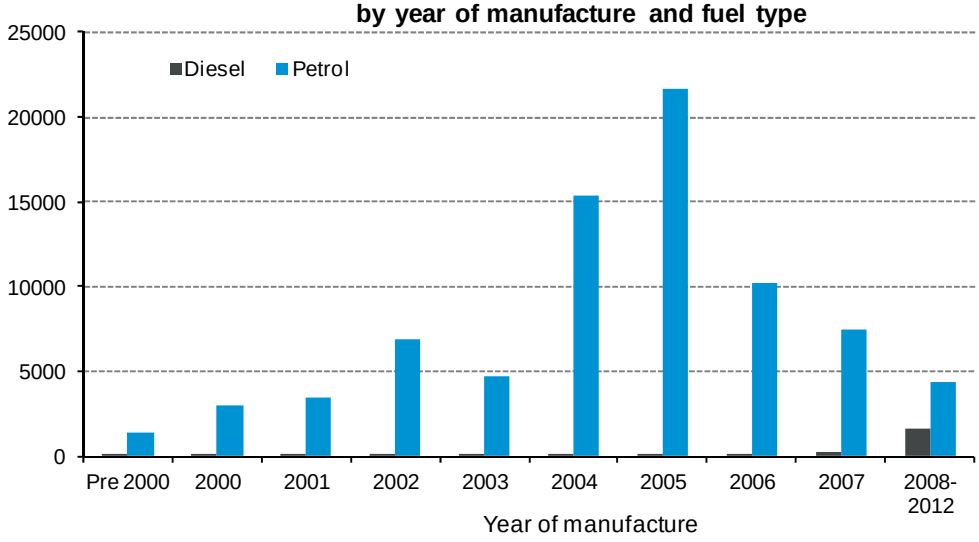
The next step of the Vehicle Exhaust Emissions Rule took effect in January 2012, again requiring vehicles to be built to 2005 standards. The effect can be seen in the reduced average age on used import registrations in 2012.

Figure 6.2a : Average age of light used imports entering the fleet



A breakdown of the 2012 used light vehicle imports by age and fuel type shows they were overwhelmingly petrol powered, and that very few were 10 or more years old.

Figure 6.2b : Used imports entering the light fleet in 2012, by year of manufacture and fuel type



The average age of used trucks and buses entering the fleet has dropped substantially following the introduction of the Vehicle Exhaust Emissions Rule, which took effect in January 2008.

Figure 6.2c : Average age of heavy used imports entering the fleet

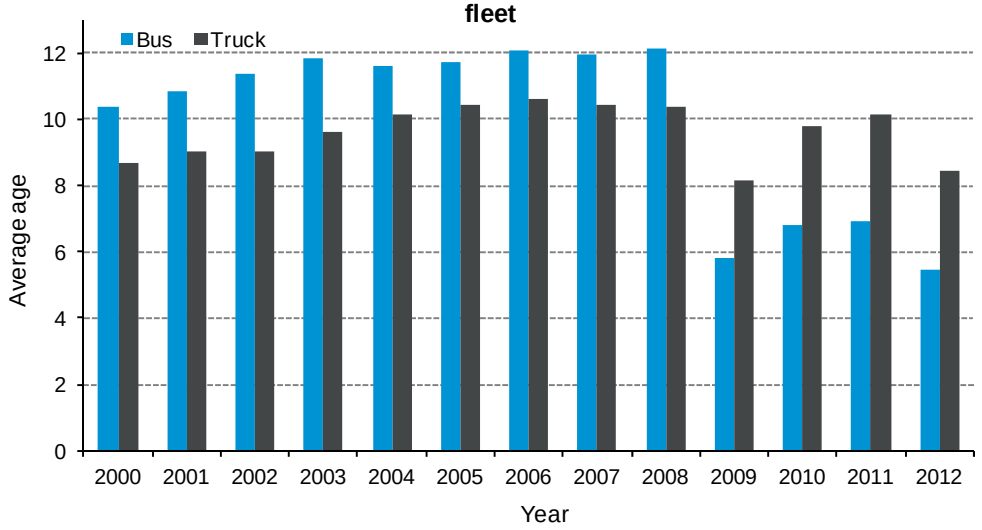
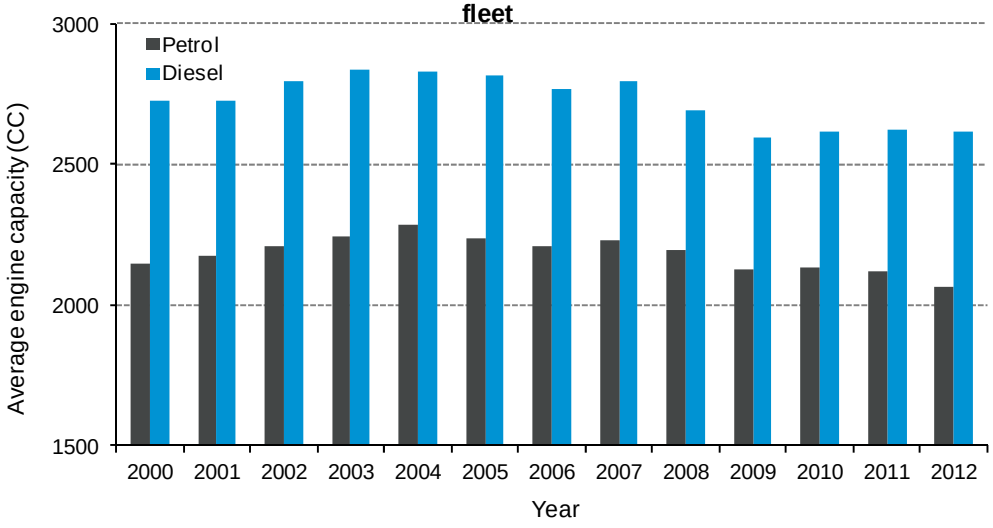


Figure 6.3 shows the average engine capacity of vehicles entering the light fleet was increasing until 2004. Figure 4.1a shows the average of all the vehicles in the light fleet.

The average engine size of entrants has decreased since 2004, however, the average engine capacity of the light fleet continued to increase for some years as the vehicles entering the fleet had larger engines than those exiting.

Figure 6.3 : Average engine size of vehicles entering the light fleet



USED IMPORT VERSUS NEW ZEALAND-NEW ENGINE CAPACITY MIX

Figure 6.4a shows the engine size mix of the used imports entering the light fleet is different to that of New Zealand-new vehicles. There are relatively more smaller-engined used imported vehicles than New Zealand-new. Figure 5.3 provides a more detailed breakdown. It shows both entry and exit, and splits petrol and diesel. There are graphs for each year in the fleet statistics spreadsheet.

Figure 6.4a : Engine size of NZ new vehicles entering the light fleet

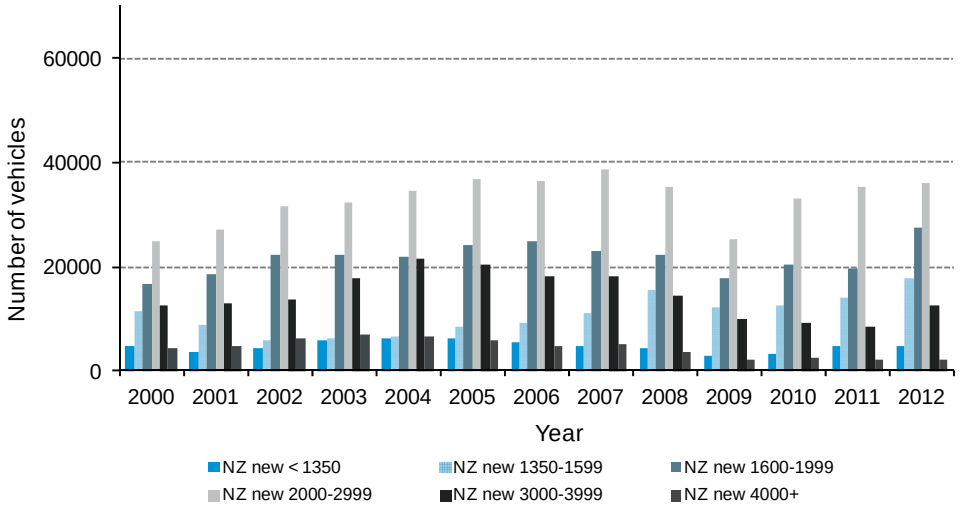
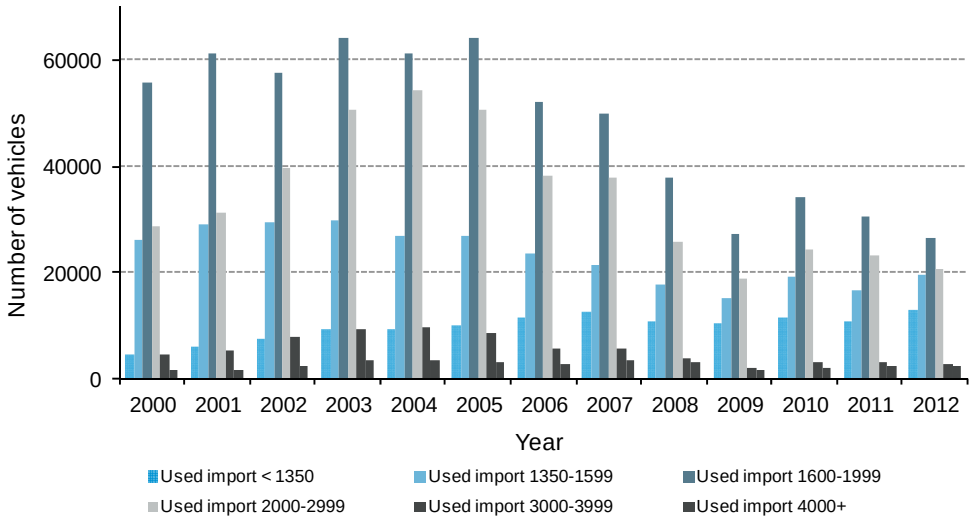
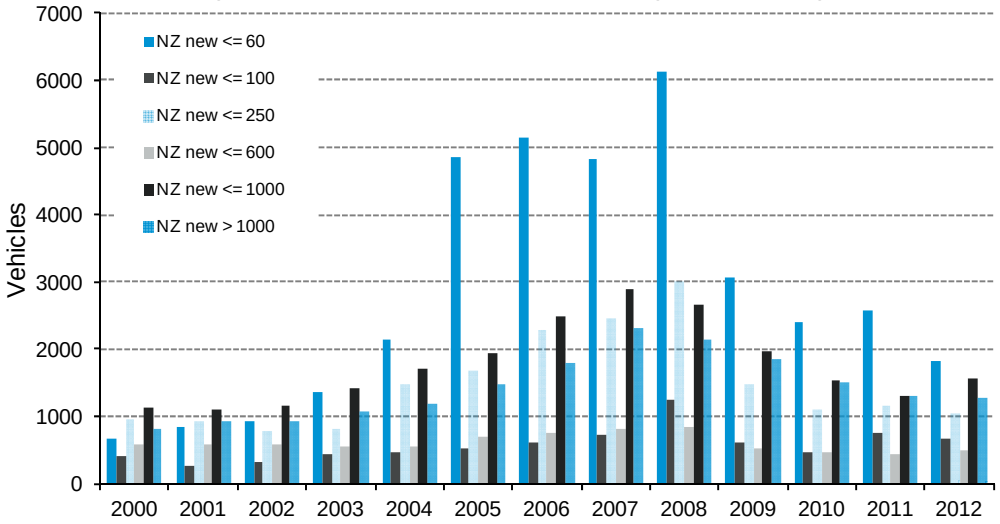


Figure 6.4b : Engine size of used imports entering the light fleet



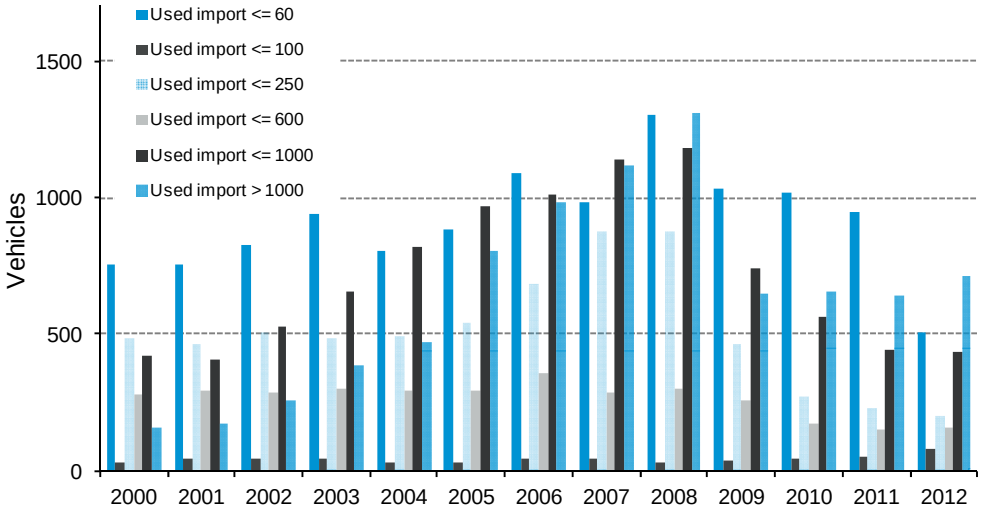
Much of the growth in new motorcycle registrations in recent years has been in machines under 60cc, although the number of larger machines has also increased.

Figure 6.5a : New Zealand new motorcycles entering the fleet



Used motorcycle imports increased from 2005 to 2008, but to a far lesser degree than new motorcycles (see above).

Figure 6.5b : Used motorcycles entering the fleet



7. VEHICLES EXITING THE FLEET

In earlier years more New Zealand-new vehicles left the fleet than used imported vehicles, but Figure 7.1a shows that this has changed now that used imports make up half the light fleet. The increase also reflects that used imports tended to leave the fleet earlier than NZ-new, although this is changing (see Figure 7.2a).

Figure 7.1a : Vehicles leaving the light fleet

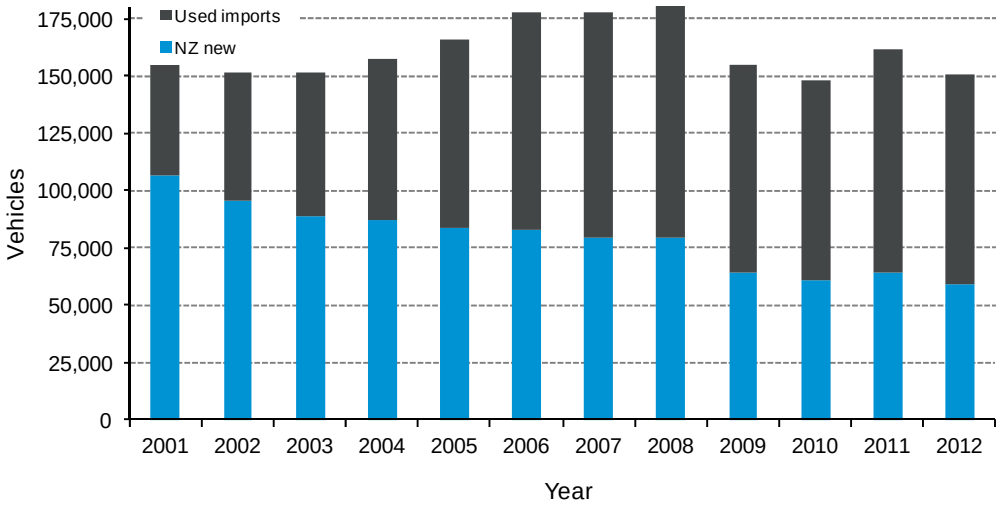
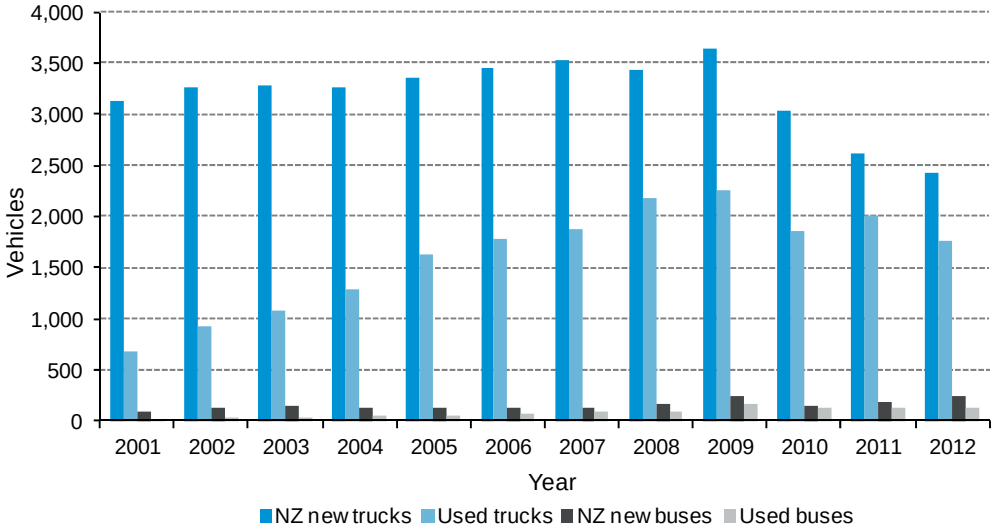


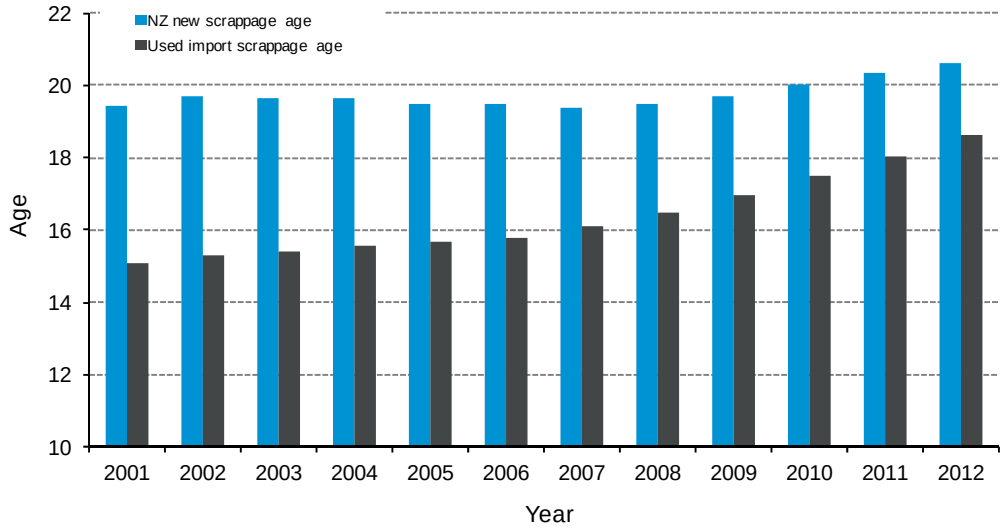
Figure 7.1b : Vehicles leaving the heavy fleet



Used imports are leaving the light fleet at an average age of 18.6 years in 2012, whereas New Zealand-new vehicles averaged 20.6 years old (see Figure 7.2a). The gap between the average ages at which New Zealand-new and used imports leave the fleet has continued to close.

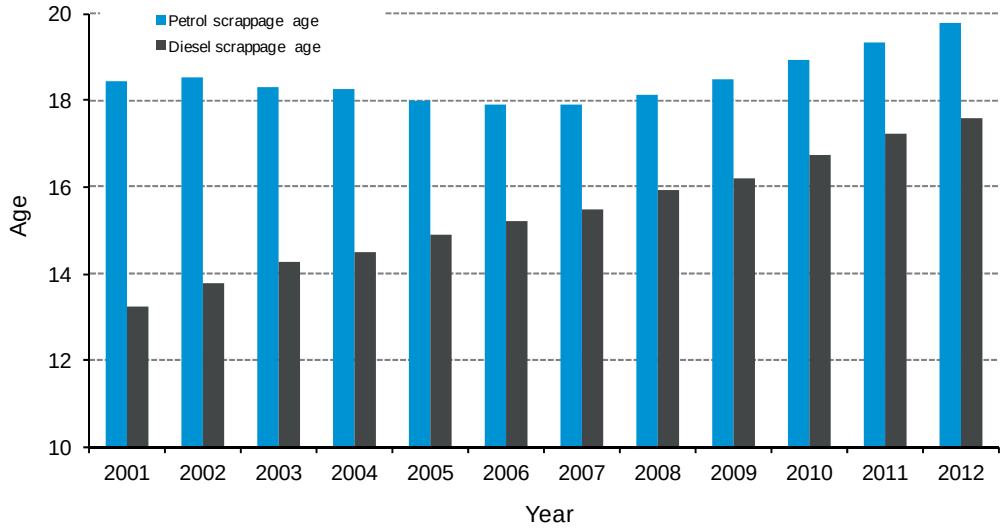
The age at scrappage for NZ new and used imports has been increasing in recent years.

Figure 7.2a : Average age when leaving the light fleet



The average age of light diesel vehicles when scrapped has risen as the light diesel fleet has changed from being very commercially orientated (vans and utes) to including large numbers of SUVs and some diesel cars. The distance covered in the lifetime of light diesel vehicles exceeds that of petrol vehicles on average, even though they are scrapped earlier (see Figure 7.3a).

Figure 7.2b : Average age when leaving the fleet



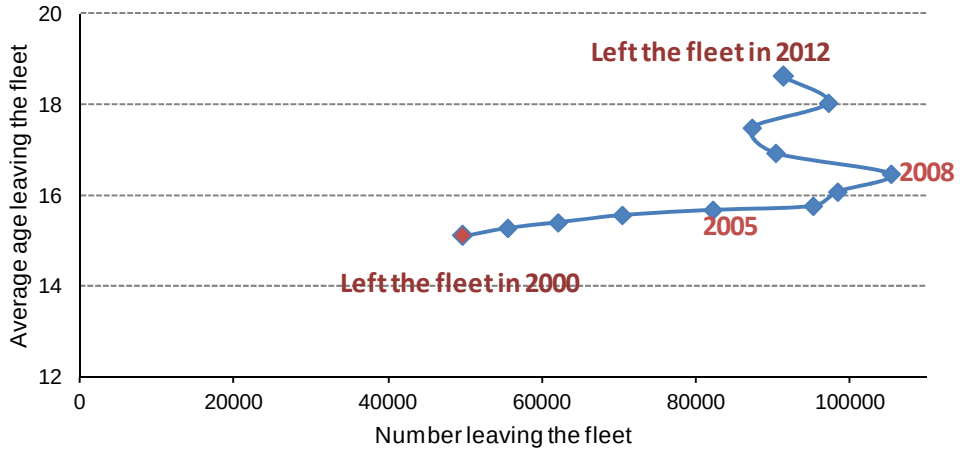
In recent years, coinciding with the economic downturn, we have seen a change in the pattern of used imports leaving the fleet. Figure 7.2c shows how the volume of used imports leaving the fleet, and the age of those vehicles, had been increasing until the economic downturn began in 2009.

The number of used imported vehicles leaving the fleet in 2009-2012 have been lower than the record number in 2008. The number leaving dropped in 2009, dropped again in 2010, increased in 2011 and dropped in 2012 (see Figure 7.2c).

The average age at scrappage of used imports has increased every year since 2006.

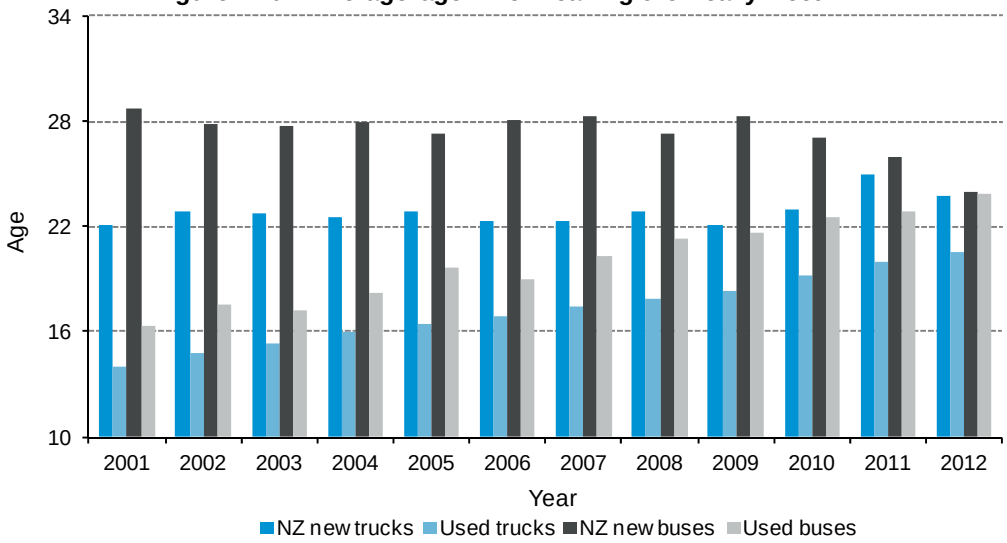
Many of the used imports manufactured in the mid 1990's will be reaching the end of their lives over the next 5 years, and the numbers leaving the fleet will increase. Figures 2.5a, 2.5b and 2.11 show the age structure of the light fleet.

Figure 7.2c Used imports leaving the fleet vs average age at that time



While not many buses leave the fleet, the average age when they do is extremely high (also see Figure 5.2d).

Figure 7.2d : Average age when leaving the heavy fleet



This page will be updated in August 2013 when more accurate travel estimates for 2012 are available.

How far have vehicles travelled before they leave the fleet? The final warrant of fitness or certificate of fitness odometer reading provides a good estimate. Figures 7.3a, 7.3b and 7.3c show that the average lifetime distance travelled has been increasing, and that trend is apparent no matter how the light fleet is split.

The lesser lifetime distance covered by used imports may reflect their smaller average engine size (see Figure 4.1a). Figure 7.3e shows that larger-engined vehicles typically cover a greater lifetime distance.

Figure 7.3a : Final odometer reading of vehicles leaving the light fleet

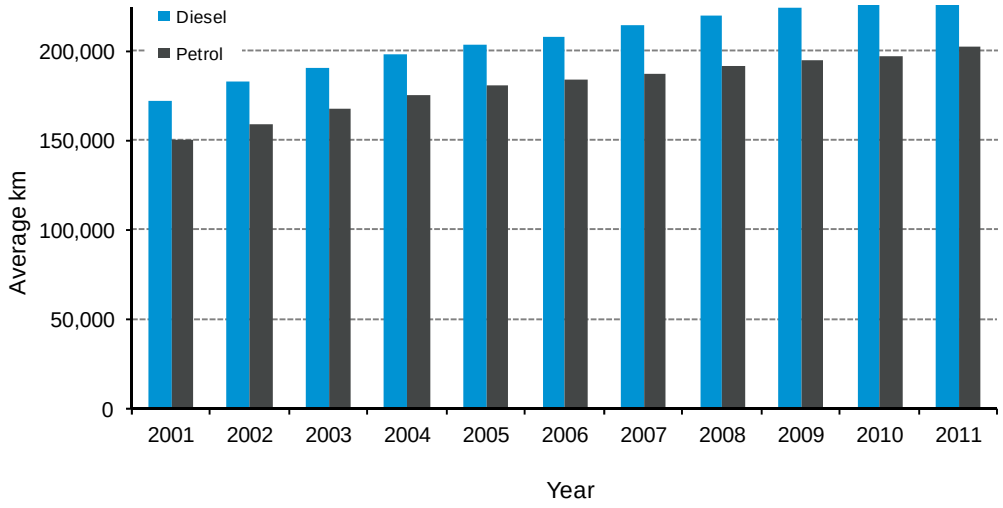
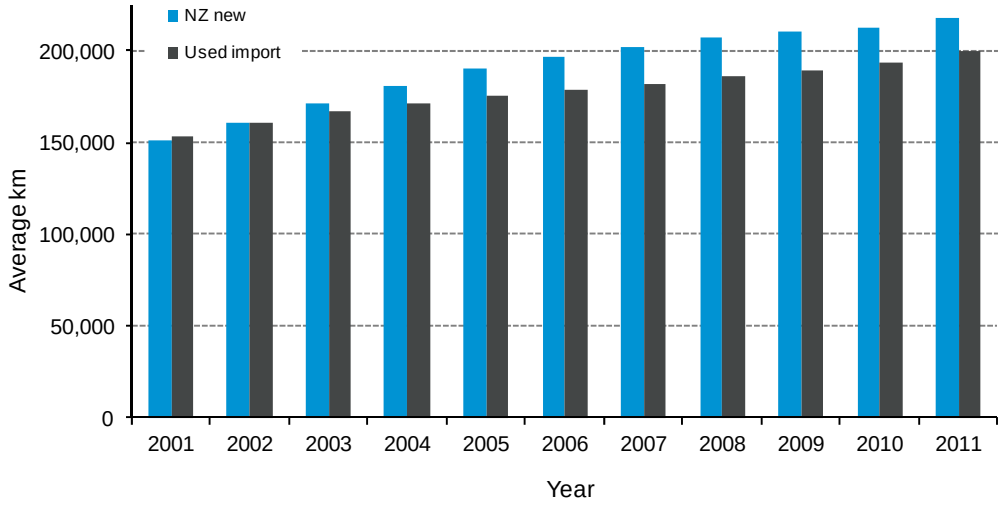
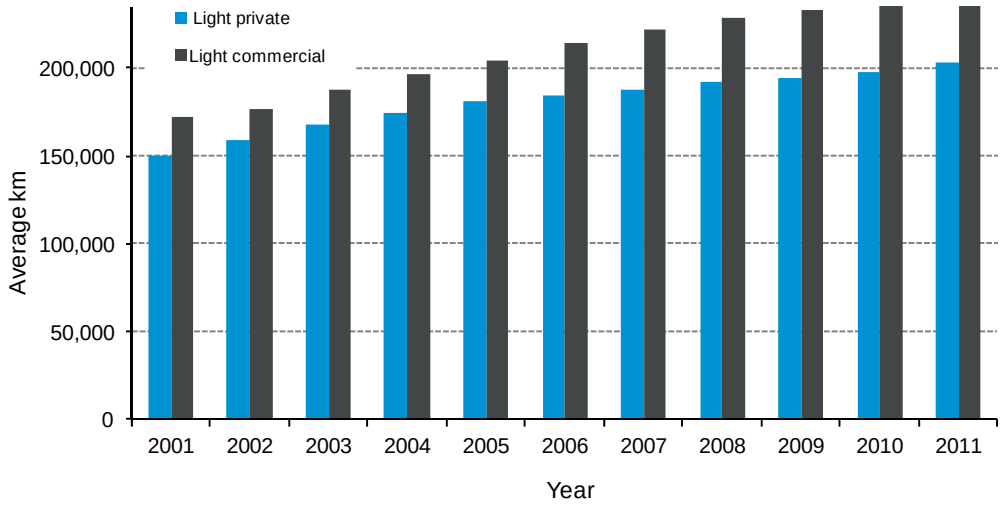


Figure 7.3b : Final odometer reading of vehicles leaving the light fleet



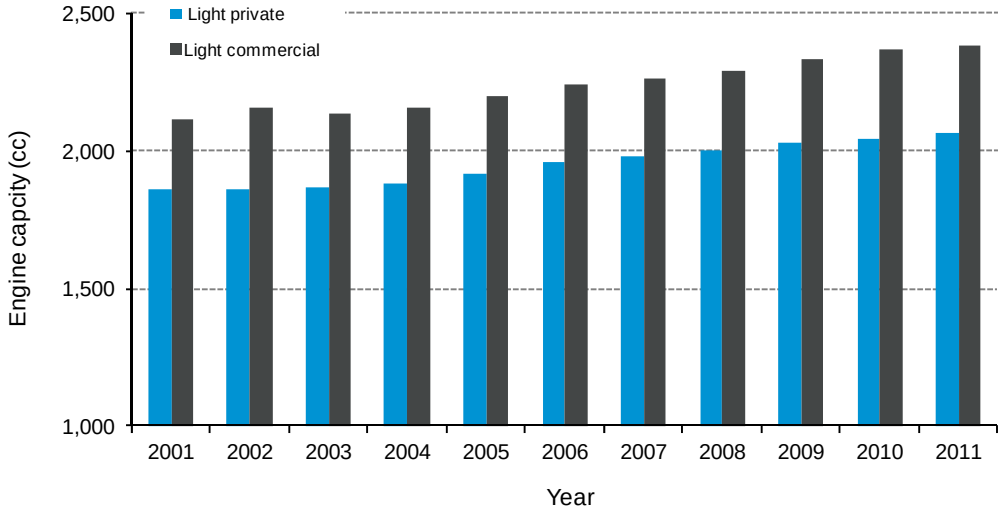
This page will be updated in August 2013 when more accurate travel estimates for 2012 are available.

Figure 7.3c : Final odometer reading of vehicles leaving the light fleet



But why would the average lifetime distance travelled have been increasing? An examination of the engine sizes of vehicles leaving the fleet shows that the average size has been increasing.

Figure 7.3d : Average engine size of vehicles leaving the light fleet



If the final odometer reading is broken down by vehicle type and engine capacity, then one underlying factor becomes clearer. Figure 7.3d shows that engine size of vehicles leaving the fleet has been increasing. Figures 7.3e and 7.3f show that larger-engined vehicles travel further in their lifetime, which, combined with 7.3d, explains in part why the fleet average lifetime distance is increasing.

In addition, Figures 7.3e and 7.3f show that lifetime distance has been increasing for vehicles of all engine sizes. When these two effects are combined, we get the lifetime distance increases seen in 7.3a, 7.3b and 7.3c.

Figure 7.3e : Final odometer reading of light passenger vehicles leaving the light fleet

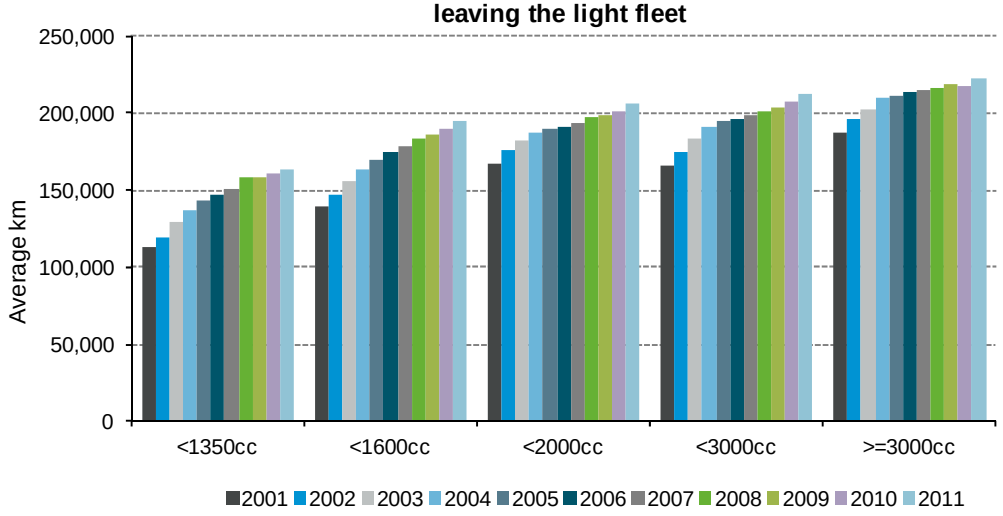
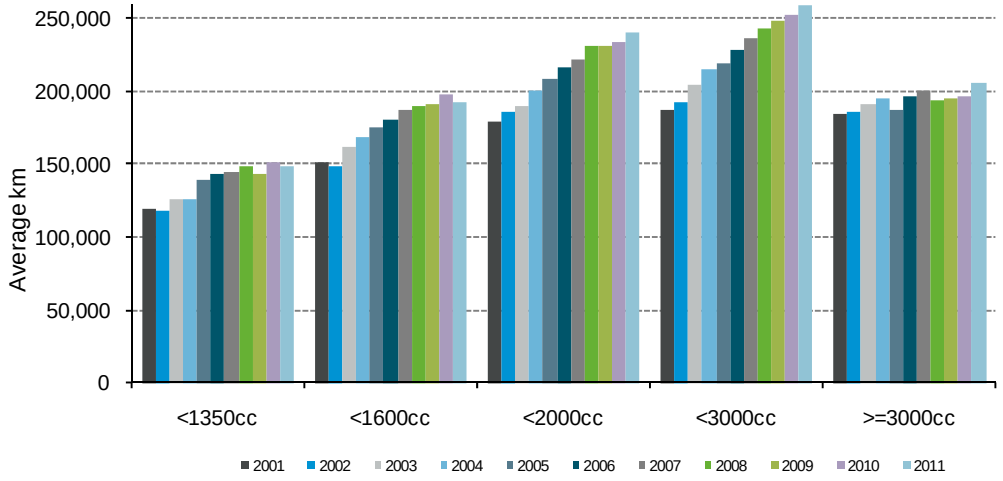


Figure 7.3f : Final odometer reading of light commercial vehicles leaving the light fleet



SCRAPPAGE CURVES

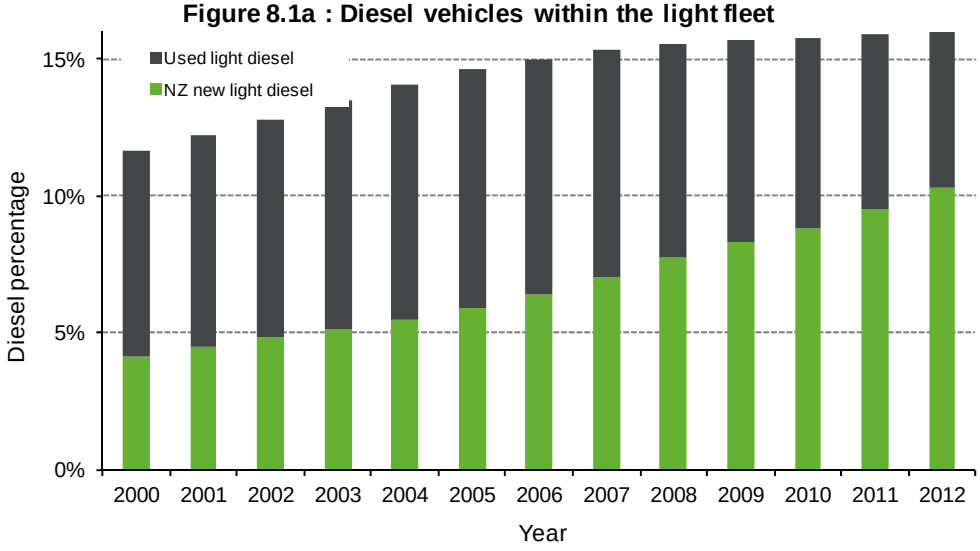
The accompanying spreadsheet (available from the research tab on the Ministry of Transport website: www.transport.govt.nz) includes scrappage curves for 2012. The curves show the percentage of vehicles of each age that were in the fleet at the start of January 2012, but gone from the fleet by the end of December 2012. They are shown in table 7.4 in the website spreadsheet.

8. THE DIESEL FLEET, DIESEL TRAVEL AND VEHICLE FUELS

THE PROPORTION OF DIESEL VEHICLES IN THE FLEET

The proportion of the light fleet, which is diesel powered, grew steadily from 11.7 percent in 2000 to 16.2 percent in 2012. The diesel share has only grown slightly since 2006. Most light diesel vehicles are commercial vehicles. The rate of growth has fallen in recent years with the decline in the import of used diesels. (Also see Table 3 and Figures 8.2a, 8.2b and 8.3.)

Figure 8.1a : Diesel vehicles within the light fleet



Most trucks are diesel powered. The petrol trucks in Figure 8.1b are either very old, or large American SUVs that weight more than 3500 kg.

Figure 8.1b : Diesel vehicles within the truck fleet

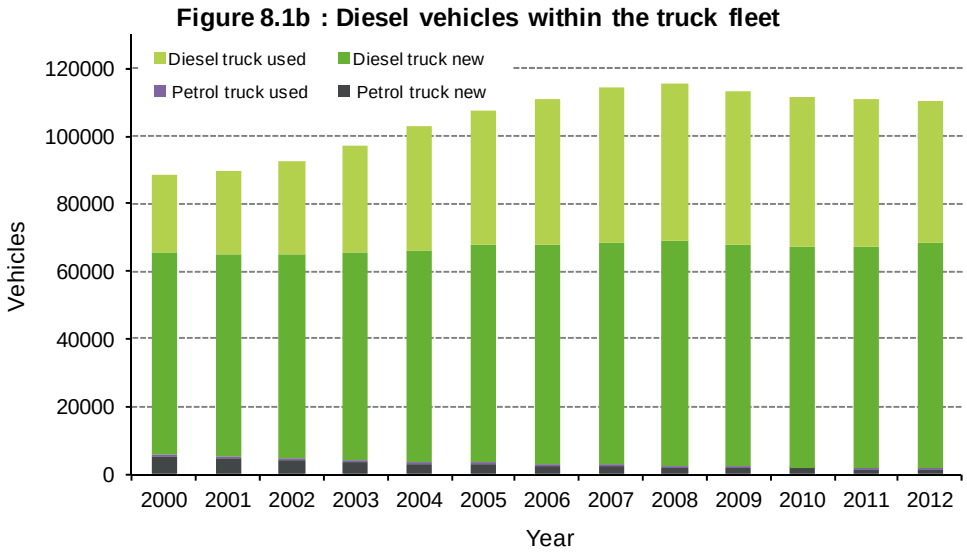
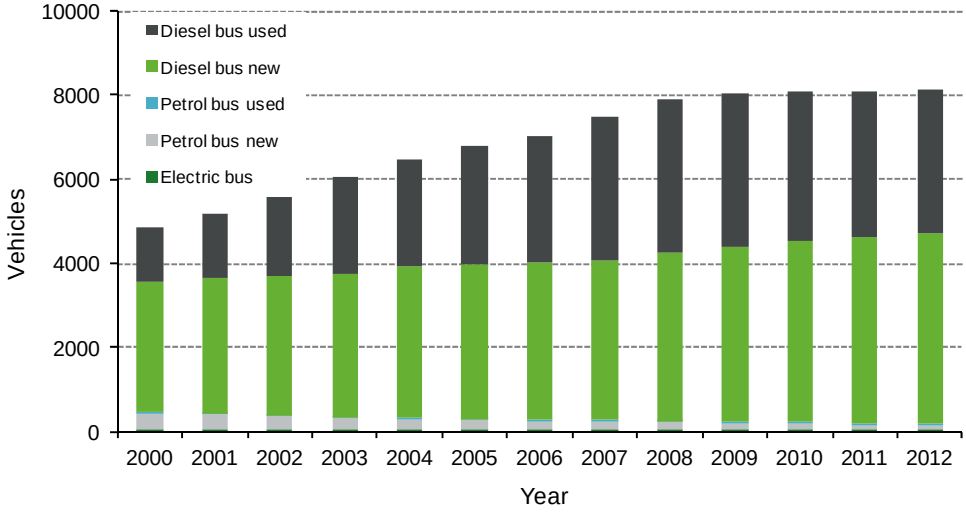


Figure 8.1c : Diesel vehicles within the bus fleet



This page will be updated in August 2013 when more accurate travel estimates for 2012 are available.

DIESEL VEHICLES IN THE LIGHT FLEET

Table 3 shows the segment of the light fleet that is diesel powered, and the percentage of light fleet travel by diesel vehicles. Figures 8.2a and 8.2b show this information for the entire light fleet (also see Figure 1.3a, which shows travel for the entire fleet).

The vehicle percentages are based on the vehicles that contributed travel during 2011. They were not necessarily still in the fleet at the end of the year.

Table 3	Diesel vehicles 2011	Diesel travel 2011
2011 Light fleet overall	16.0%	20.4%
2011 Light passenger fleet	8.5%	9.8%
2011 Light commercial fleet	67.0%	75.7%

Figure 8.2a : Light fleet makeup by fuel type 2011

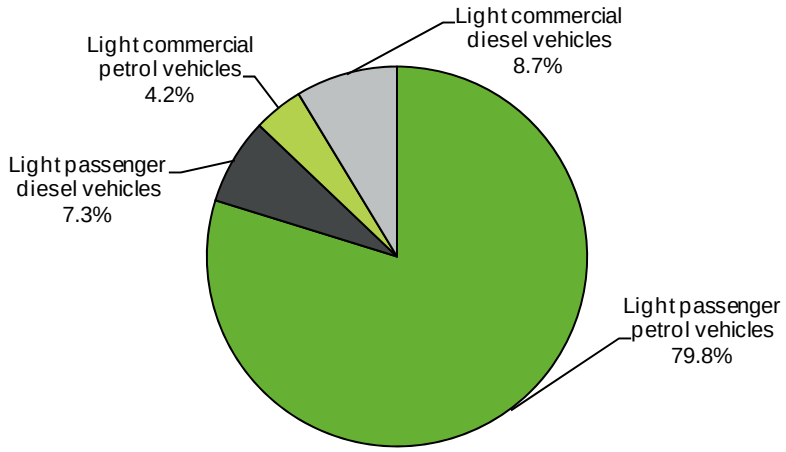
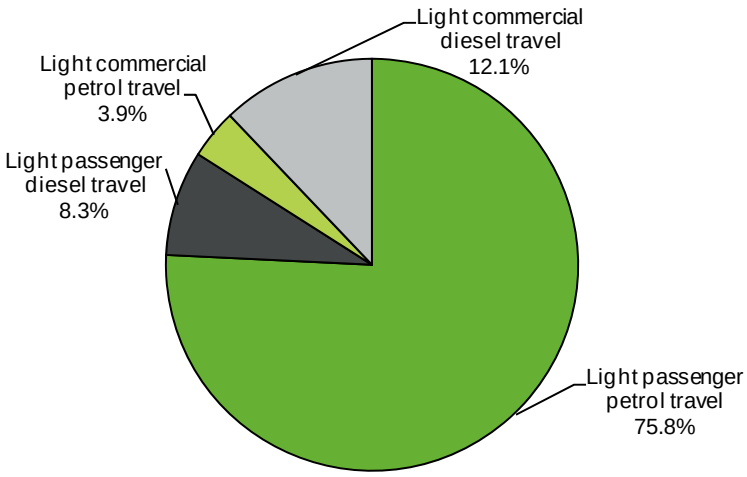


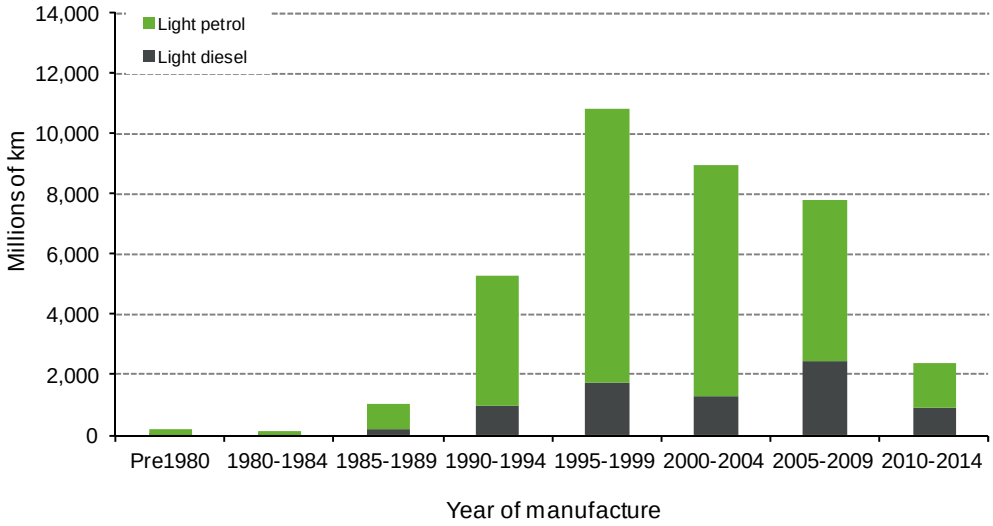
Figure 8.2b : Light fleet travel by fuel type 2011



This page will be updated in August 2013 when more accurate travel estimates for 2012 are available.

Light fleet travel can also be broken down by year of manufacture. Figure 8.3 shows that a high proportion of the light fleet diesel travel is by vehicles manufactured in the second half of the 1990's, when the harmful emissions standards that vehicles were built to were typically far inferior to recent standards[10].

Figure 8.3 : Light petrol and diesel travel in 2011



[10] The PM (Particulate Matter) column in Table 1 in http://www.dieselnet.com/standards/eu/hd.php shows how successive standards have tightened emission requirements.

VEHICLE FUEL TYPES

Primary and secondary fuels

When vehicles are first registered in New Zealand they are required to indicate a primary fuel type. For the vast majority, this is petrol or diesel, but it can also be CNG, LPG, electricity or "other". The record can also indicate if there is a secondary fuel. This is often CNG or LPG for dual fuel vehicles. Unfortunately the secondary fuel field is not always filled in correctly and some of the data presented in these tables is clearly incorrect or absent. It is extremely unlikely that there are vehicles that operate on both petrol and diesel, for example. We are also aware that the field is not always updated when vehicles are converted to run on LPG or CNG, or if a conversion to another fuel is subsequently removed.

Hybrids

There is no specific code on the register to indicate a hybrid vehicle. Hybrid electric vehicles, such as the Toyota Prius or Honda Insight should be recorded as having a primary fuel of petrol and a secondary fuel of electricity (or potentially the other way around). The numbers of dual fuel petrol and electric vehicles is less than the known number of hybrid vehicles when selected by model.

Table 4 Vehicle fuel types, Dec 2012

Fuel	No alternative fuel		With an alternative fuel					Total
			Petrol	Diesel	Electricity	CNG	LPG	
Light vehicles								
Petrol	2528232		0	190	676	1282	2530	2532910
Diesel	486126		4545	0	6	51	81	490809
Electricity	73		0	0	0	0	0	73
CNG	21		1	0	0	0	0	22
LPG	1197		16	1	0	2	0	1216
Unknown	98		0	0	0	0	1	99
Total	3015747		4562	191	682	1335	2612	3025129
Motorcycles and mopeds								
Petrol	111682		0	0	1	10	7	111700
Diesel	3		0	0	0	0	0	3
Electricity	291		0	0	0	0	0	291
CNG	1		0	0	0	0	0	1
LPG	3		0	0	0	0	0	3
Unknown	49		0	0	0	0	0	49
Total	112029		0	0	1	10	7	112047
Buses								
Petrol	85		0	1	0	0	5	91
Diesel	7916		1	0	0	4	1	7922
Electricity	59		0	1	0	0	0	60
CNG	29		1	0	0	0	0	30
LPG	12		0	0	0	0	0	12
Unknown	0		0	0	0	0	0	0
Total	8101		2	2	0	4	6	8115
Trucks								Total
Petrol	1553		0	1	0	5	69	1628
Diesel	108588		72	0	0	24	13	108697
Electricity	0		0	0	0	0	0	0
CNG	19		0	0	0	0	0	19
LPG	66		1	0	0	2	0	69
Unknown	5		0	0	0	0	0	5
Total	110231		73	1	0	31	82	110418

Table 4 Vehicle fuel types, Dec 2012 — continued								
Fuel	No alternative fuel		With an alternative fuel					Total
			Petrol	Diesel	Electricity	CNG	LPG	
Other vehicle types								Total
Petrol	945		0	0	0	2	14	961
Diesel	13704		1	0	0	1	0	13706
Electricity	5		0	0	0	0	0	5
CNG	2		0	0	0	0	0	2
LPG	44		0	0	0	0	0	44
Unknown	41		0	0	0	0	0	41
Total	14741		1	0	0	3	14	14759

Figure 8.4a shows that the number of light vehicles primarily fuelled by CNG, LPG or electricity is very low. Figure 8.4b shows that the number of light vehicles with an alternative fuel of CNG or LPG has dropped to very low levels over the last decade. As already noted, the vehicles with an alternative fuel of electricity are typically hybrids, but not all hybrids are recorded in the vehicle register in this way.

Figure 8.4a : Primary light vehicle fuel

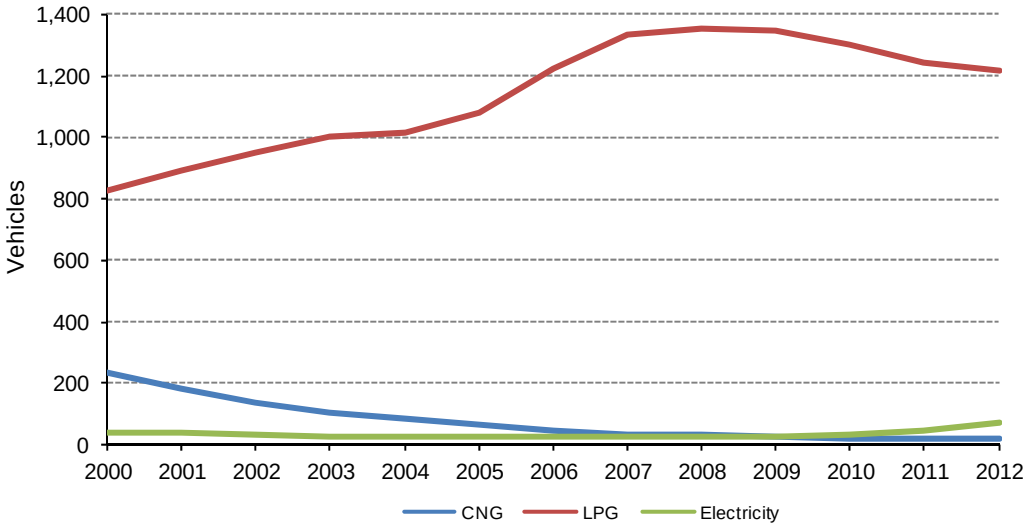
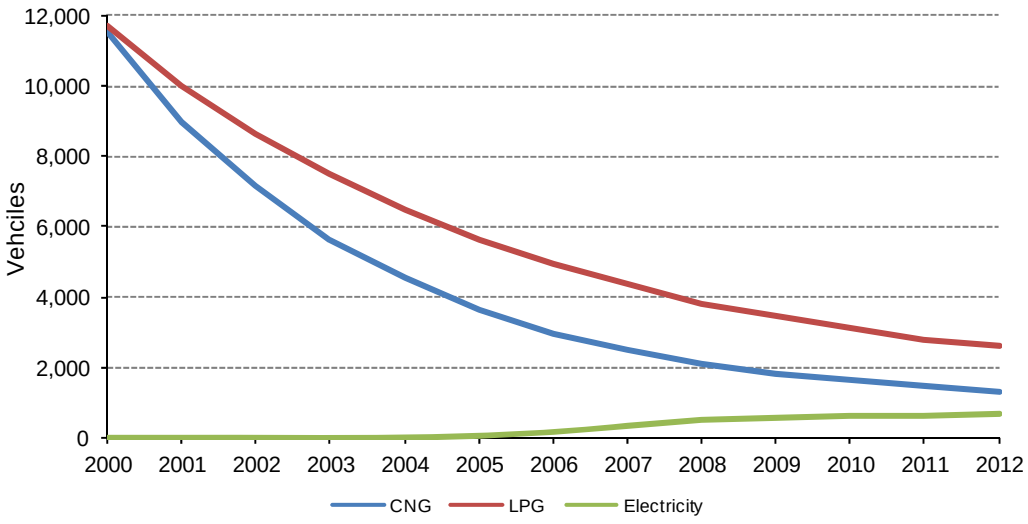


Figure 8.4b : Alternative light vehicle fuel



9. HOW FUEL-EFFICIENT IS THE LIGHT FLEET?

THE CO_2 EMISSIONS OF NEW LIGHT VEHICLES ENTERING THE FLEET

Figure 9.1a shows the CO_2 emissions[11] per kilometre of travel of New Zealand-new light vehicles that entered the fleet from April 2005.

Figure 9.1a shows that the market share of the more fuel efficient petrol vehicles (up to 200g CO_2/km) has been growing. This may be partly due to a move to diesel SUVs instead of large-engine petrol vehicles.

Figure 9.1a : New Zealand new light vehicle registrations CO_2 emissions per km driven

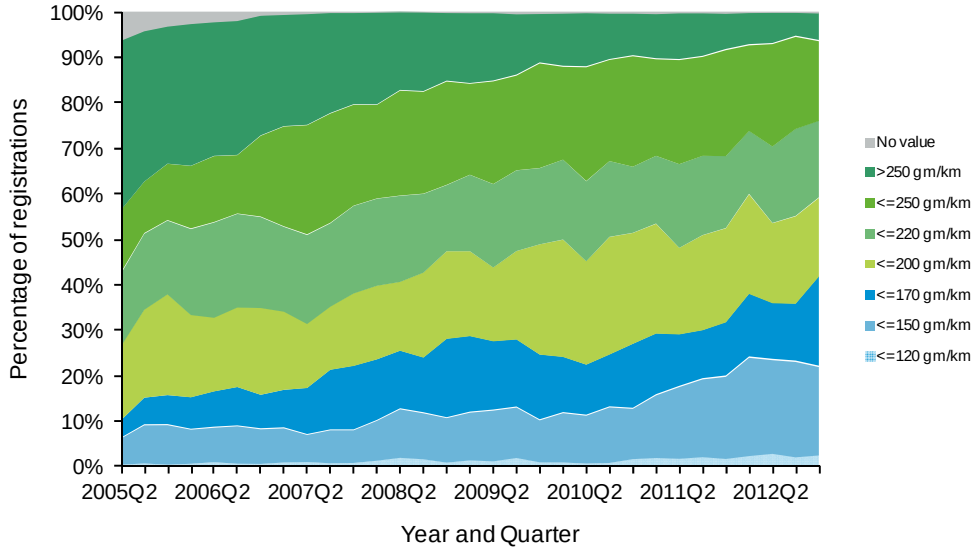
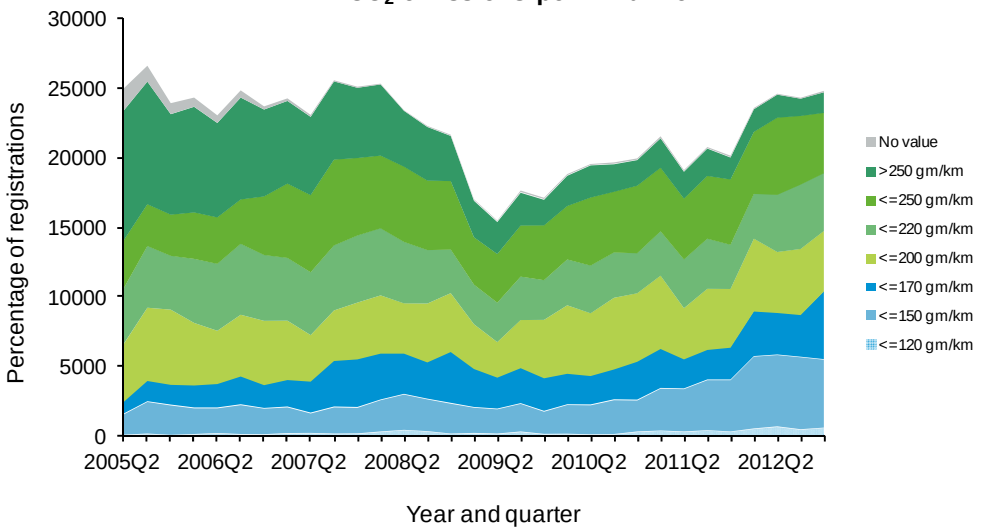


Figure 9.1b : New Zealand new light vehicle registrations CO_2 emissions per km driven



The values shown are for vehicles tested using the European test methodology (cold start). A small number of new vehicles are tested to the Japanese test standard (warm start) and their values have not been included as they are not directly comparable. A cold start test generally returns a higher consumption value than a warm start test for the same vehicle. The technical notes on page 59 detail how the gram per km calculations are done.

[11] Vehicles using petrol or diesel produce CO_2 in direct proportion to the amount of fuel used.

THE CO_2 EMISSIONS OF USED LIGHT PETROL VEHICLES ENTERING THE FLEET

Figure 9.2a is an estimation[12] of the carbon dioxide emissions of light used imported vehicles.
The lower consumption segments (under 200 g/km) have been increasing their market share, although the segment with the highest consumption (over 250 g/km) has remained relatively constant.

Figure 9.2a : Used import light petrol registrations CO_2 emissions per km driven

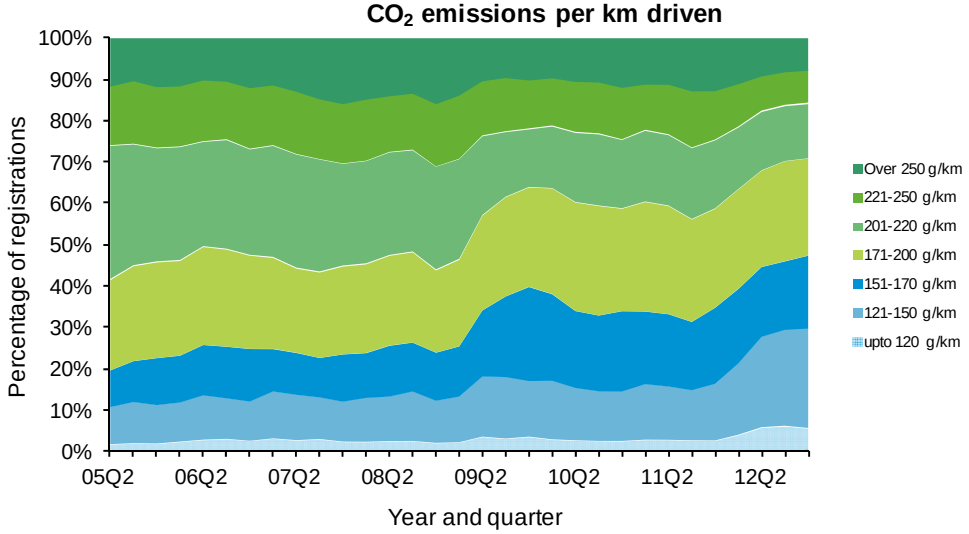
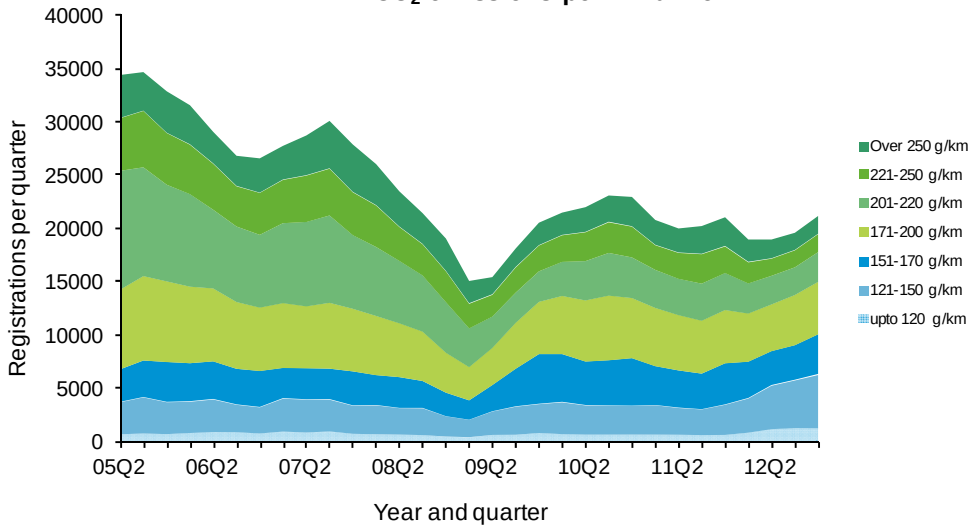


Figure 9.2b : Used import light petrol registrations CO_2 emissions per km driven



[12] The estimation process:

1. Convert the Japanese test values to European test values, using the Ministry's Japanese warm cycle to Euro cold cycle test converter (unpublished).
2. Split each quarter's new registrations into engine capacity bands.
3. Use the vehicles with known consumption values, in each engine capacity band, to establish a CO_2 mix for that engine capacity band and quarter.
4. Apply the CO_2 mix for each engine capacity band to the vehicles without a value for that quarter.

THE CO_2 EMISSIONS OF USED DIESEL VEHICLES ENTERING THE FLEET

Only 4 percent of used import diesel vehicles had known fuel consumption, therefore it is not possible to analyse their fuel economy (see Table 5 in the Fleet Statistics spreadsheet).

Typically, used diesels will have higher fuel consumption than the used petrol vehicles, as the diesel engines are larger.

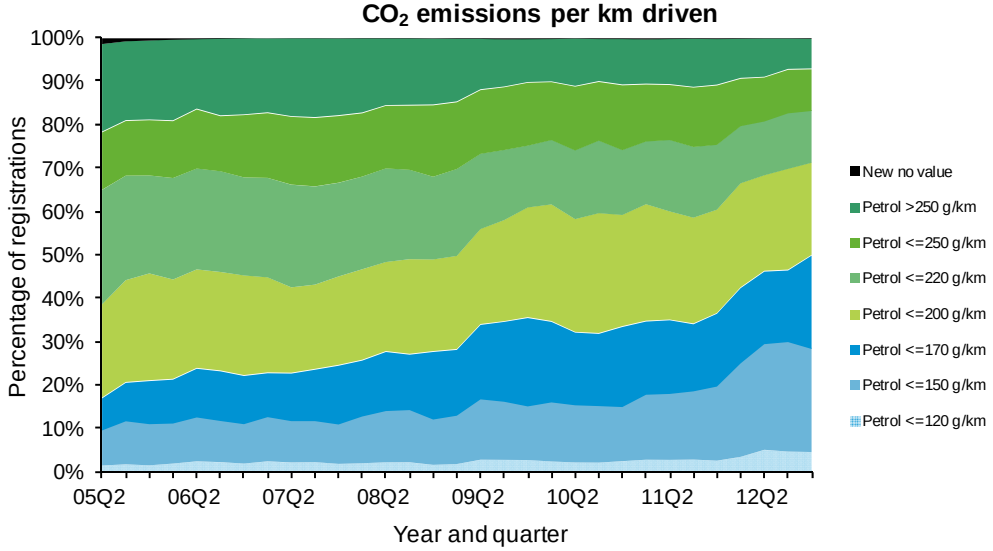
The number of used diesels imported is now very low (see Figure 5.3) and their omission from the figures below will not affect the result.

THE CO2 EMISSIONS OF PETROL VEHICLES AND NEW DIESEL VEHICLES ENTERING THE LIGHT FLEET

Figure 9.3a shows the CO_2 emissions of the new and used petrol vehicles combined.

New Zealand-new vehicles with Japanese test cycle values have been included, after their values have been converted[13] to the equivalent European test value. The fuel economy of used imports without fuel economy values has been estimated using the methodology described on page 59.

Figure 9.3a : New and used light petrol registrations CO_2 emissions per km driven



[13] See page 59 for a description of the CO_2 emissions estimation process.

Figure 9.3b : New and used light petrol registrations
CO_2 emissions per km driven

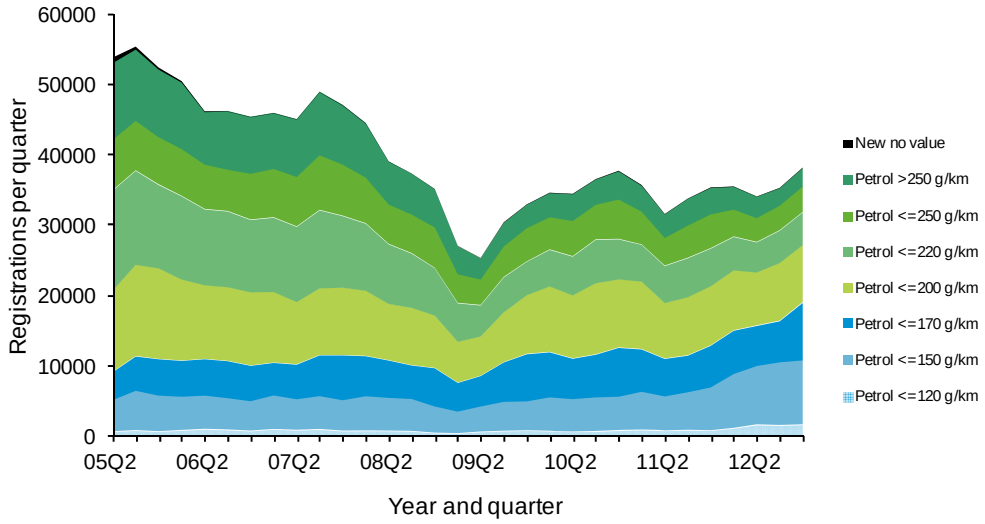


Figure 9.3c shows the CO_2 emissions of the new diesel vehicles. Used diesel vehicles could not be analysed as too few of them have known fuel consumption values.

Figure 9.3c : New light diesel registrations
CO_2 emissions per km driven

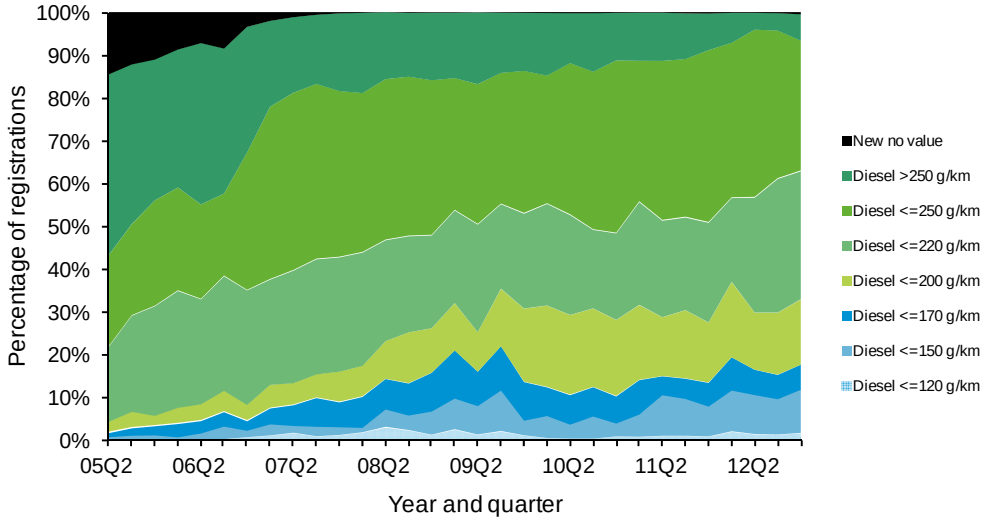
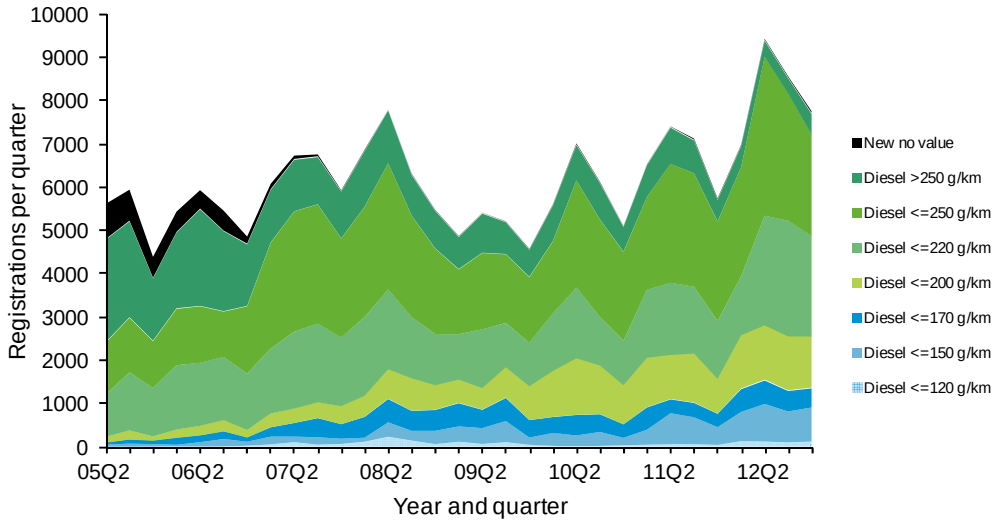


Figure 9.3d : New light diesel registrations
CO_2 emissions per km driven



AVERAGE CO_2 EMISSIONS OF LIGHT VEHICLES ENTERING THE FLEET

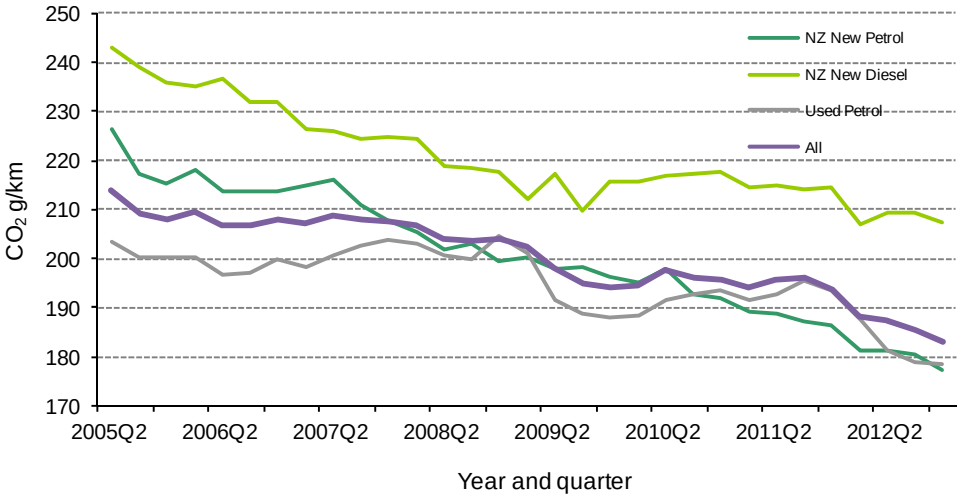
Figure 9.4 is a summary of the information that has been presented in Figures 9.1, 9.2 and 9.3. It shows some response to the increased fuel prices in 2006[14], 2008, 2011 and 2012.

Note, however, that the used import fuel consumption data is not as reliable as the new vehicle data. The Ministry of Transport has estimated values from the used petrol imports that have a fuel consumption test value, and the Japanese test cycle values have also been converted to European test cycle values.

The used diesel imports are not included in the analysis, as too few of them have known fuel consumption. Used diesels make up a very low fraction of used imports now.

Figure 9.4 shows that there was an improvement in fuel economy of light vehicles entering the fleet from 2005 to 2009. There was little improvement in the 2010 and 2011, but there has been marked drop since then (also see Figure 9.6). Figure 9.4 is updated each quarter in the Quarterly Fleet Statistics.

Figure 9.4 : Light vehicle registrations
Average CO_2 emissions



TECHNICAL NOTES

How CO_2 per km is calculated

The fuel consumption test results recorded on the vehicle register have been converted from litres per 100km (L/100km) to grams of CO_2 per kilometre driven. This allows direct comparison of petrol and diesel vehicles, which have different fuel consumption and CO_2 emissions (diesel vehicles typically have lower fuel consumption than their petrol equivalents, but there is more carbon in a litre of diesel compared with a litre of petrol). The conversions that have been used are:

- Diesel g CO_2 per km = 26.05 x diesel consumption (L/100km)[15]
- Petrol g CO_2 per km = 22.961 x petrol consumption (L/100km)[16]

The petrol factor is based on the carbon content of the regular/premium mix sold in New Zealand in 2005 (premium petrol has a higher carbon content than regular petrol).

The CO_2 emissions of used import light diesel vehicles entering the fleet

Ideally it would be possible to present the same information shown in Figures 9.5a and 9.5b for the used import light diesels. Table 5 in the Fleet Statistics spreadsheet shows few of these vehicles have a fuel consumption test value recorded, so reporting is not possible.

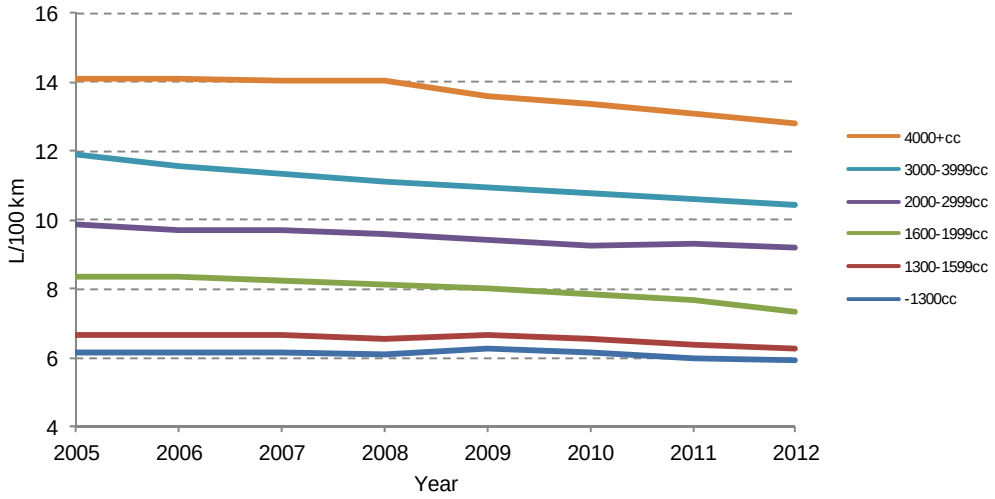
[14] See Section 12.
[15] Ministry of Economic Development, NZ Energy Greenhouse Gas Emissions 1990–2006.
[16] Ministry of Economic Development, NZ Energy Greenhouse Gas Emissions 1990–2006.

HOW HAVE THESE ECONOMY GAINS COME ABOUT?

Figure 9.8 shows the fuel economy of light vehicles entering the fleet has improved from about 220g CO_2/km in 2005 to 183g/km in 2012.

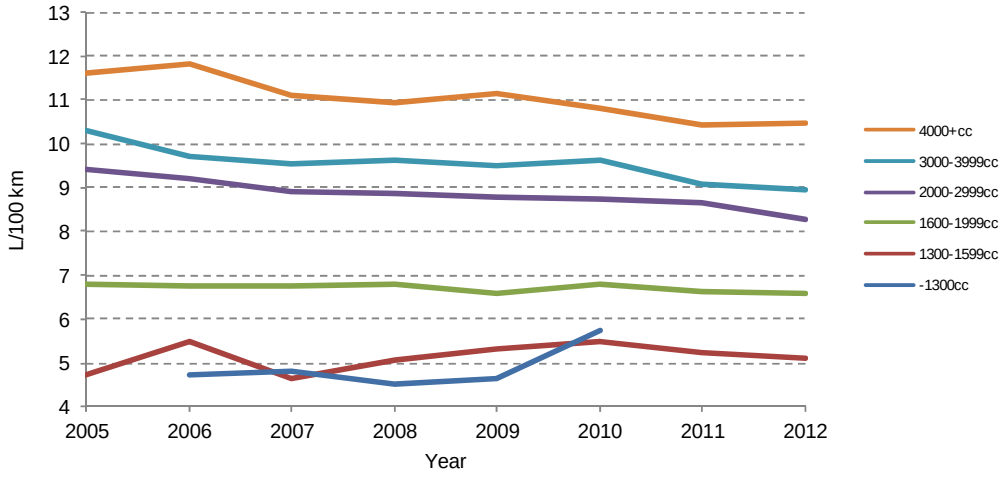
Figures 9.10a and 9.10b shows the economy trends within each engine cc band. The decreases have not been particularly marked (apart from the two largest categories of petrol vehicles), which suggests that some of the fleet reduction has been achieved by downsizing the engine purchased, or by purchasing diesels rather than the largest petrol vehicles.

Figure 9.6a : Petrol economy trend



The economy trend for diesels with engine capacity under 1300cc varies as the sales of those vehicles are very limited.

Figure 9.6b : Diesel economy trend



10. WHAT IS THE AVERAGE VEHICLE ENGINE SIZE AND AGE OF THE VEHICLES IN USE?

This page will be updated in August 2013 when more accurate travel estimates for 2012 are available.

The average vehicle age and engine capacity of the light fleet has already been detailed. But how does it compare with the average vehicle that is actually travelling on the road?

The technique to establish this is to weight engine size and age by travel.

If the fleet consisted of a 1000cc car that did 5,000 km/year and a 2000cc van that did 12,000 km/year:

- The average engine size of the fleet would be 1500cc = (1000+2000)/2.
- The travel-weighted engine size would be (1000x5000 + 2000x12000) / (5000+12000) = 1706cc.

Similarly, if the fleet consisted of a 10-year-old vehicle doing 4,000km/year, and a 4-year-old vehicle doing 10,000km/year:

- The average fleet age would be seven years = (4+10)/2.
- The average travel-weighted fleet age would be (10 x 4000 + 4 x 10000) / (4000 + 10000) = 5.7 years.

Using this technique, we learn in Figures 10.1 and 10.2 that the average vehicle actually travelling is younger than the average vehicle in the fleet, and that it has a larger engine capacity than the average vehicle in the fleet.

Figure 10.1 : Light fleet travel weighted average vehicle age

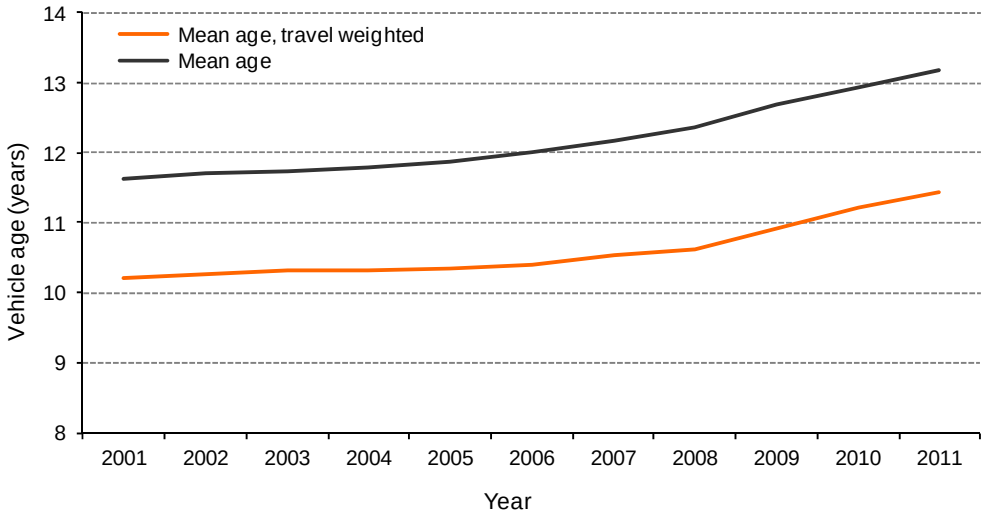
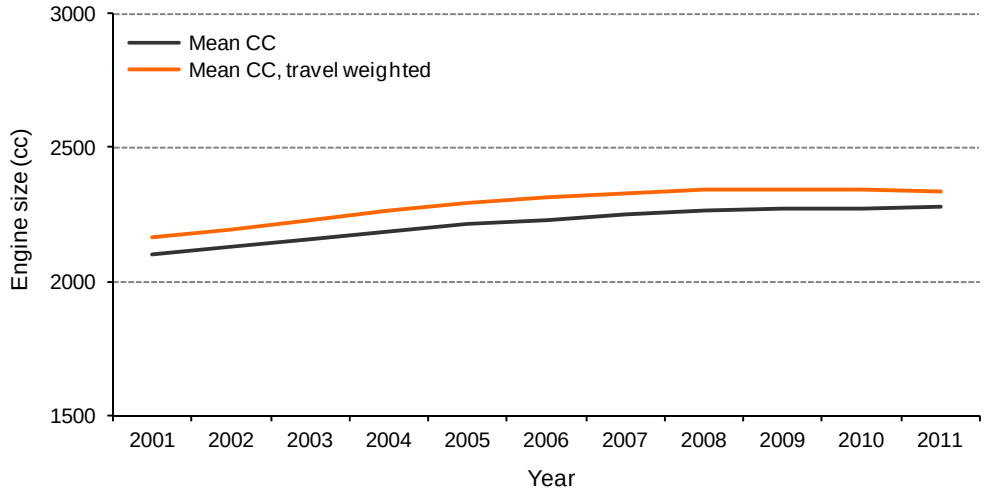


Figure 10.2 : Light fleet travel weighted average engine size



11. ROAD FREIGHT

The Road Freight section of this report was based on road user charges (RUC) data but changes to RUC in August 2012 mean this analysis can no longer be carried out. The results for 1992-2011 are available in the Fleet Statistics spreadsheet, tab 11.1, 11.2.

ACKNOWLEDGEMENTS

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APPENDIX A: COMPARABILITY WITH OTHER PUBLISHED DATA

The fleet statistics in this analysis are not directly comparable with data published by the Transport Registry Centre of the NZTA. This analysis is based on a slightly different categorisation of the vehicle fleet and assessment of the number of active vehicles.

The information in this publication has been derived from a data extract from the New Zealand Motor Vehicle Register (MVR) which holds information on all active vehicles in New Zealand.

VEHICLE CATEGORISATION

The vehicle categorisation is the one used in the Vehicle Fleet Emissions Model (VFEM)[17], rather than the vehicle split traditionally found in statistics published annually by the New Zealand Transport Agency.

The major difference from the New Zealand Transport Agency statistics is that in this analysis, light vehicles (under 3.5 tonnes) have been categorised into light passenger vehicles and light commercial vehicles. In the New Zealand Transport Agency data, light commercial vehicles are included with trucks, but they may actually be cars, vans, utes or SUVs. The New Zealand Transport Agency categorisation is therefore not as useful when projecting the make-up of the fleet for the purposes of estimating fuel use or the level of emissions.

The objective of the Vehicle Fleet Emissions Model is to estimate the size and activity of the on-road fleet. For this reason, vehicles exempt from licensing (typically those used off-road) and vehicles with restoration licences are excluded from the analysis.

Table 9	Motor Vehicle Register vehicle types	Mass
Light Passenger Fleet	Passenger car/van	Up to 3500 kg
Light Commercial fleet	Goods van/truck/utility Motor caravan Bus (*)	Up to 3500 kg
Bus	Bus	Over 3500 kg
Truck	Passenger car/van Goods van/truck/utility Motor caravan	Over 3500 kg
Motorcycles	Motorcycle ATV Moped	
Miscellaneous (**)	Mobile machine Special purpose vehicle Tractor Agricultural machine	

(*) Light buses have been included in the light fleet as they have the same fuel use and emissions characteristics. Physically they are vans and SUVs.

(**) A small number of vehicles are classified as ‘miscellaneous'. Many of these vehicles are exempt from licensing and therefore not included in these analyses.

[17] The VFEM is a computer model of the New Zealand vehicle fleet that is used to predict emissions. Much of the analysis in this report was carried out as part of work by the Ministry of Transport to improve the accuracy of the VFEM.

VEHICLE CATEGORISATION VS MOTOR VEHICLE REGISTER VEHICLE BODY TYPE

The breakdown of vehicle categorisation by vehicle body type for the December 2012 fleet is shown in Table 10.

Table 10

	Fleet Statistics category						
Motor Vehicle Register Body Type	Light passenger vehicle	Light commercial vehicle	Heavy goods vehicle	Bus	Motor-cycle	Miscellaneous	Total
Articulated Truck	-	72	6,796	-	-	-	6,868
Cab And Chassis Only	-	3,436	1,548	9	-	-	4,993
Convertible	25,954	0	1	-	-	-	25,955
Flat-Deck Truck	-	14,472	15,918	-	-	-	30,390
Hatchback	651,610	-	-	-	-	-	651,610
Heavy Bus	-	12	164	-	-	-	176
Heavy Van	200	10,503	4,202	-	-	-	14,905
Light Van	40,121	98,826	220	-	0-	-	139,167
Minibus	-	13,063	-	88	-	-	13,151
Mobile Machine	-	-	-	-	-	6,838	6,838
Motorcycle	424	-	-	0	112,047	0	112,471
Other Truck	0	11,607	63,207	0	0	1,294	76,108
Saloon	945,444	-	8	-	-	-	945,452
Self-Propelled Caravan	-	10,788	17,637	-	-	-	28,425
Service Coach	-	93	-	8,018	-	-	8,111
Sports Car	48,427	-	-	-	-	-	48,427
Station Wagon	915,319	3,673	105	-	-	-	919,097
Tractor	-	-	-	-	0	6,627	6,627
Unknown	-	1	5	-	-	-	6
Utility	5,879	225,205	607	-	-	-	231,691
Total	2,633,378	391,751	110,418	8,115	112,047	14,759	3,270,468

NUMBER OF ACTIVE VEHICLES

The number of potentially active vehicles is a critical factor in estimation of travel and fuel use by the fleet. The traditional administrative practice of New Zealand Transport Agency has been to include vehicles in fleet statistics unless either their owner actively de-registers them, or the vehicle has not been re-licensed for 12 months. This approach is likely to over-estimate the size of the active fleet, as some vehicles will become inactive well within the 12 months.

An alternative approach has therefore been taken in this analysis. In this case, as with the New Zealand Transport Agency practice, vehicles are included in these fleet statistics unless they are de-registered. However, we have also excluded those vehicles where their warrant of fitness or certificate of fitness renewal is more than six months overdue. This is considered more realistic[18].

VEHICLE TRAVEL ESTIMATES

Vehicle travel estimates have been calculated on the basis of the difference between successive warrant of fitness or certificate of fitness odometer readings. The resulting fleet travel estimate has been validated against three large-scale traffic counting exercises conducted by the former Land Transport Safety Authority (LTSA).

[18] It is acknowledged that a small number of vehicles will continue to operate without a warrant of fitness or registration. As the number of these vehicles is unknown, no attempt has been made to include them, however including the vehicles in the active fleet until their warrant of fitness/certificate of fitness is six months overdue may compensate.