Te tatauranga rāngi waka a tau 2021 | Annual fleet statistics 2021

Report of Te Manatū Waka Ministry of Transport

November 2022

Te Kāwanatanga o Aotearoa
New Zealand Government

New Zealand's Motor Vehicle Fleet - Insights Brief

1 Executive summary

The Ministry of Transport publishes annual statistics of New Zealand's historical motor vehicle fleet using Waka Kotahi's motor vehicle register (MVR) information as a key data source. This year, the publication for the period 2000-2021 has been split into: an insights brief (this report) and an interactive open data tool that allows users to explore the data and download it in machine readable format.

The continuous growth of the transport system and the dominance of fossil fuels in the sector have major impacts on our society and our environment. In 2020 the sector was responsible for over 41 per cent of energy greenhouse gas (GHG) emissions. To reach New Zealand's target of net-zero long-lived emissions by 2050, the transport sector is expected to deliver four targets by 2035 - as described in New Zealand's first Emissions Reduction Plan (ERP).

This report presents trends and insights in motor vehicle fleet and travel for the period 2000-2021. We relate the trends to transport outcomes, in particular the ERP transport targets.

Key insights identified are:

- Vehicle numbers have increased steadily over the last decade, and 2021 had the largest fleet size to date.
- The total motor vehicle fleet of 2021 equates to 889 vehicles per 1,000 people - one of the highest rates of vehicle ownership in the world.
- Light vehicles have dominated the motor vehicle fleet, representing about 91%.
- Both light commercial vehicles (LCVs) and light passenger vehicles (LPVs) have grown in number over the past decade. While LCVs represent a smaller proportion of the fleet (compared to LPVs), their number has increased by 70% in the past decade. LPV numbers increased by 27% in the same time period.
- Total vehicle kilometres travelled in 2021 was 47.4 billion kilometres - close to the pre-pandemic value (47.8 billion kilometres).
- Travel per vehicle has been decreasing since 2001 though this trend does not imply that people are driving less. Instead, it can be explained by an increase in the number of vehicles per household - consistent with New Zealand's high levels of vehicle ownership.
- The light vehicle fleet continues to be dominated by petrol though the share of diesel vehicles (dieselisation) in the light commercial fleet, buses, and trucks, has been increasing over time.
- Fewer than 1% of light vehicles are battery electric vehicle (BEV) or plug-in hybrid electric vehicle (PHEV).
- BEV + PHEV are a small minority but their uptake has grown quickly from 2020 to 2021. The uptake of zero and low-emission vehicles is expected to grow further due to policies such as the Clean Car Standard and the Clean Car Discount.
- Average reported CO_2 emissions of vehicles entering the light fleet has decreased over time, but further reduction is required to meet the Clean Car Standard requirements.

- Tonne-km of road freight have consistently increased over time.
- The share of used trucks entering the fleet has increased in the last decade.

2 Key insights

The following sections summarise key insights from New Zealand's motor vehicle fleet for the period 2000-2021. Insights are grouped in themes according to the ERP transport targets for 2035. The open data behind these summaries can be accessed here with options to download the data in machine readable format.

2.1 Overall fleet count

> **Related ERP target**: reduce total kilometres travelled by the light fleet by 20% by 2035 through improved urban form and providing better transport options, particularly in our largest cities (ERP target 1 for transport).

Figure 1 shows the total number of motor vehicles over time, and the number of vehicles per 1,000 people. Population data used in this calculation was extracted from Stats NZ Infoshare considering data for the second quarter.

- New Zealand's motor vehicle fleet has been increasing over the last 10 years with over 4.5 million vehicles in 2021 - the highest fleet size to date.
- The 2021 motor vehicle fleet equates to 889 vehicles per 1,000 people - one of the highest rates of vehicle ownership in the world.

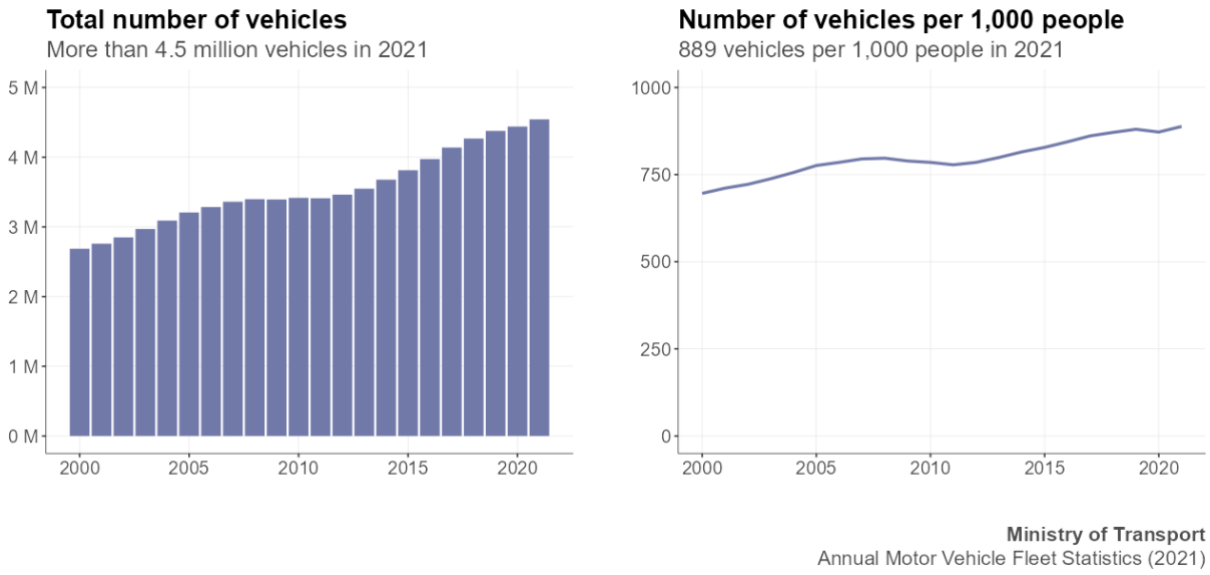

Figure 1: Total number of road motor vehicles over time, and the number of vehicles per 1,000 people.

2.2 Overall fleet travel

Figure 2 shows total vehicle kilometres travelled over time and per vehicle.

- Compared to the number of vehicles (which has increased consistently in the last decade), total kilometres travelled has flattened out since 2018. Note that 2020 was an anomalous year for transport due to travel restrictions during the COVID-19 lockdowns.

- Total vehicle kilometres travelled in 2021, of more than 47 billion kilometres, has recovered close to the pre-pandemic value.
- Travel per vehicle has been decreasing since 2001, with a sharp decrease in 2020 consistent with the COVID-19 pandemic, followed by a slight increase in 2021. This decreasing trend of kilometres travelled per vehicle does not imply that people are driving less. Instead, it could be explained by an increase in number of vehicles per household which is consistent with New Zealand's high levels of vehicle ownership.

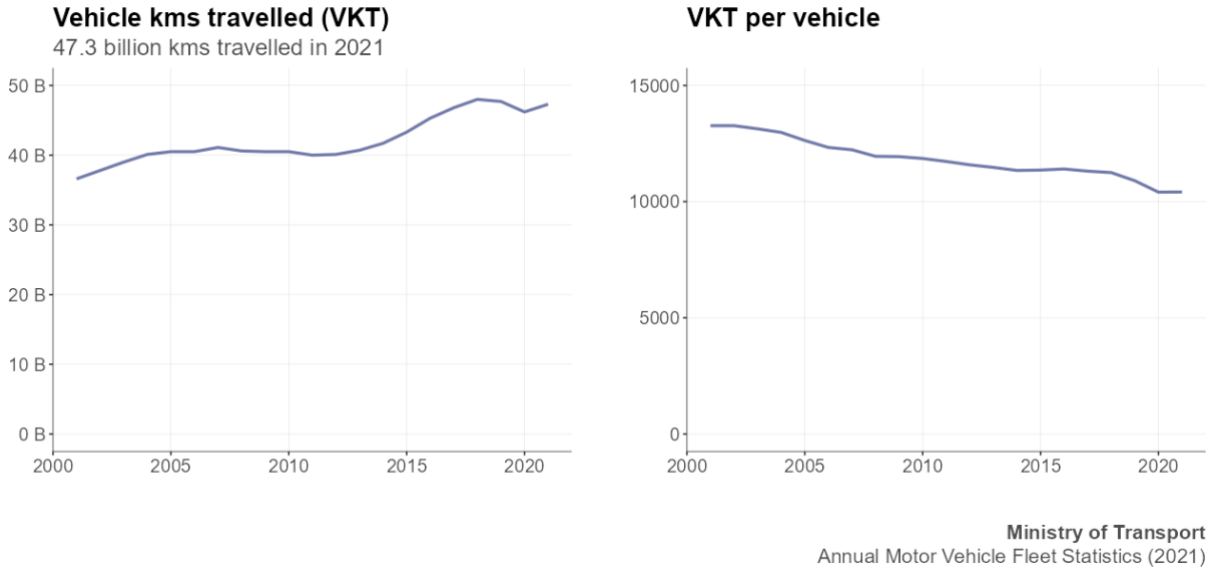

Figure 2: Total vehicle kilometres travelled over time and per vehicle.

2.3 Fleet composition

Figure 3 shows a waffle chart of the fleet composition in 2021 (vehicle classification is described in Section 4.1).

- About 91% of motor vehicles in the 2021 fleet are light passenger and commercial vehicles (e.g., cars, vans, utes, SUVs, buses and camper vans up to 3500 kg). This percentage of light vehicles has been relatively steady since 2000.

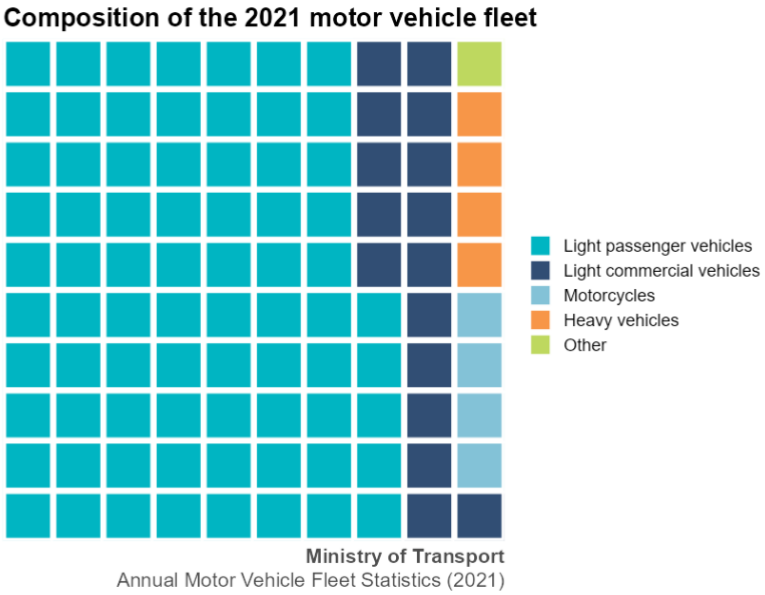

Figure 3: Waffle chart of the fleet composition in 2021.

2.4 Light fleet count

Figure 4 shows the number of light passenger vehicles (LPV) and light commercial vehicles (LCV) over time. As seen in Figure 3, LPVs and LCVs represent around 91% of the fleet.

- Although LCVs represent a smaller proportion of the fleet compared to LPVs, their number has increased by 70% in the past decade. By contrast, LPVs have only increased by 27% in the same time period. This reflects a trend towards larger and heavier vehicles equipped with larger engines that have been the typical option for commercial use.

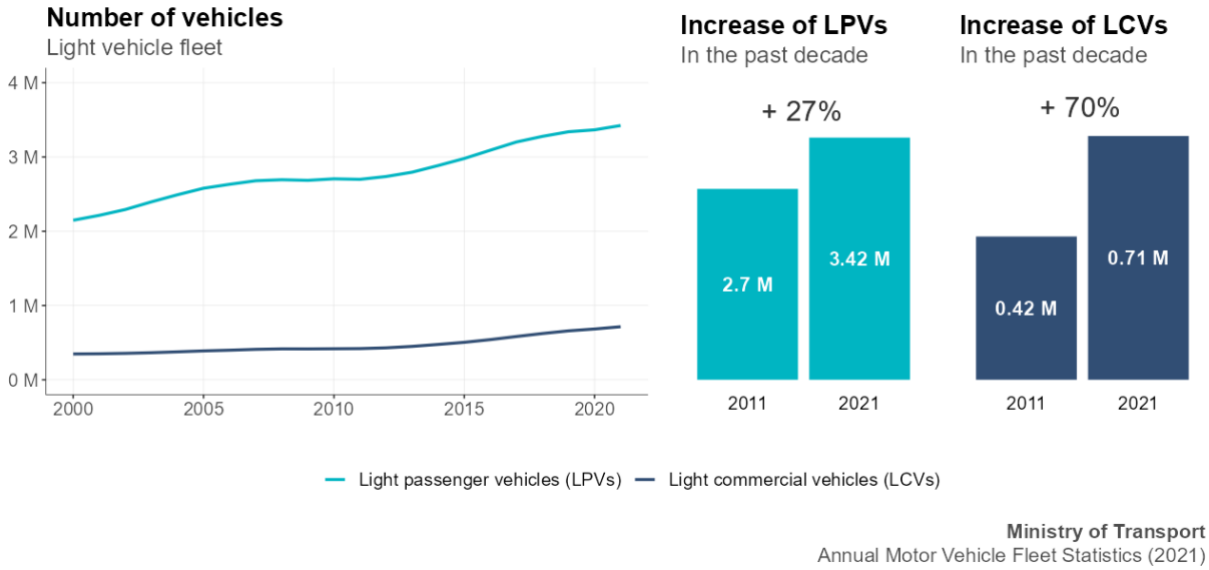

Figure 4: Light passenger vehicles (LPV) and light commercial vehicles (LCV) over time.

2.5 Fleet fuel mix

> **Related ERP target**: increase zero-emissions vehicles to 30% of the light fleet by 2035 (ERP target 2 for transport) and reduce the emissions intensity of transport fuel by 10% by 2035 (ERP target 4 for transport).

Figure 5 shows the fuel mix of light vehicles in 2021, and the number of light vehicles by fuel over time.

- The light vehicle fleet continues to be dominated by petrol.
- Less than 1% of light vehicles are battery electric vehicle (BEV) or plug-in hybrid electric vehicle (PHEV).
- Diesel light vehicles are steadily increasing in number and at a faster rate than petrol vehicles. This is consistent with the faster increase of LCVs in the fleet which are diesel-fuelled (as seen in Figure 6).
- BEV + PHEV are a small minority but their uptake has grown fast from 2020 to 2021. Due to the introduction of the Clean Car Standard (which regulates CO_2 emissions of vehicles entering New Zealand) and the Clean Car Discount (which encourages buyer demand for low-emission vehicles), the uptake of zero and low-emission vehicles is expected to continue accelerating.

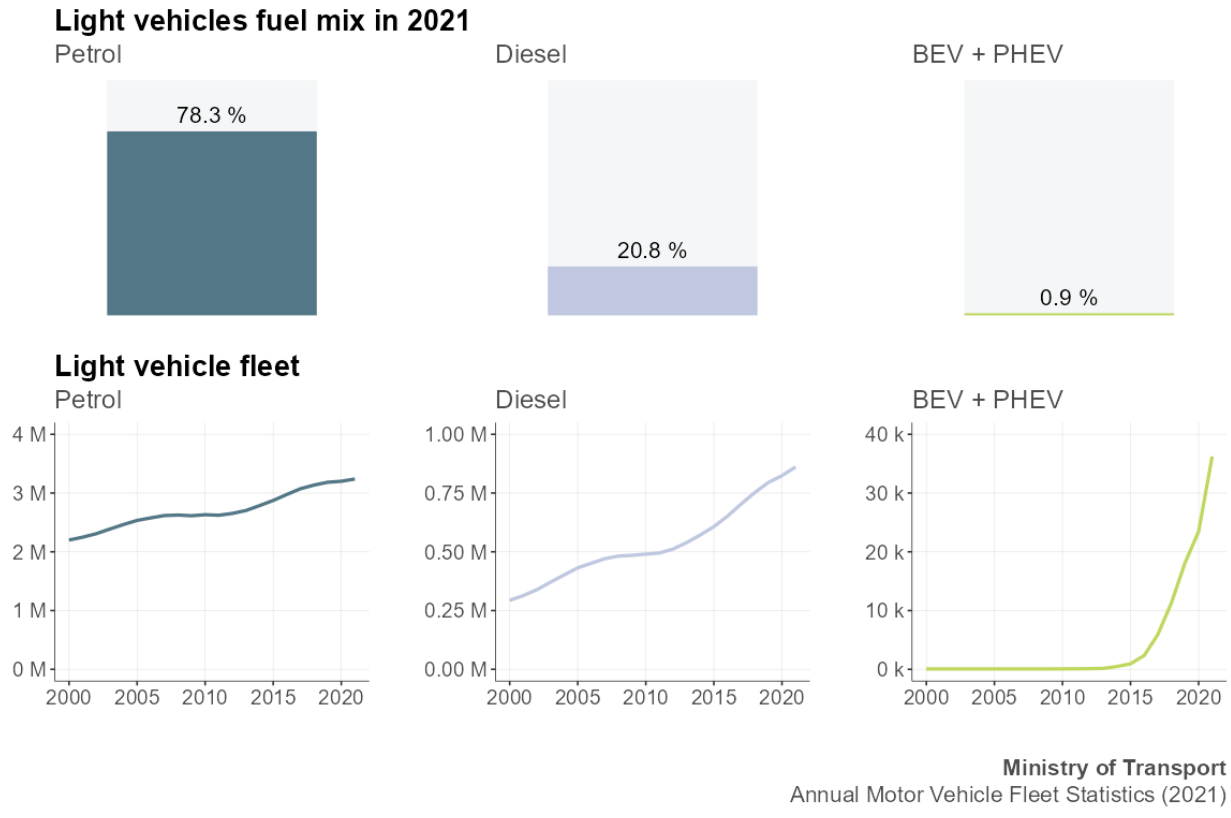

Figure 5: Fuel mix of light vehicles in 2021, and the number of light vehicles by fuel over time.

Figure 6 shows the contribution of petrol and diesel vehicles to the total number of petrol and diesel vehicles.

- Most light passenger vehicles are fuelled by petrol.
- The share of diesel vehicles (dieselisation) in the light commercial fleet, buses, and trucks, has increased over time. Dieselisation has been significant for LCVs with the fuel ratio flipping towards diesel vehicle majority since 2005.

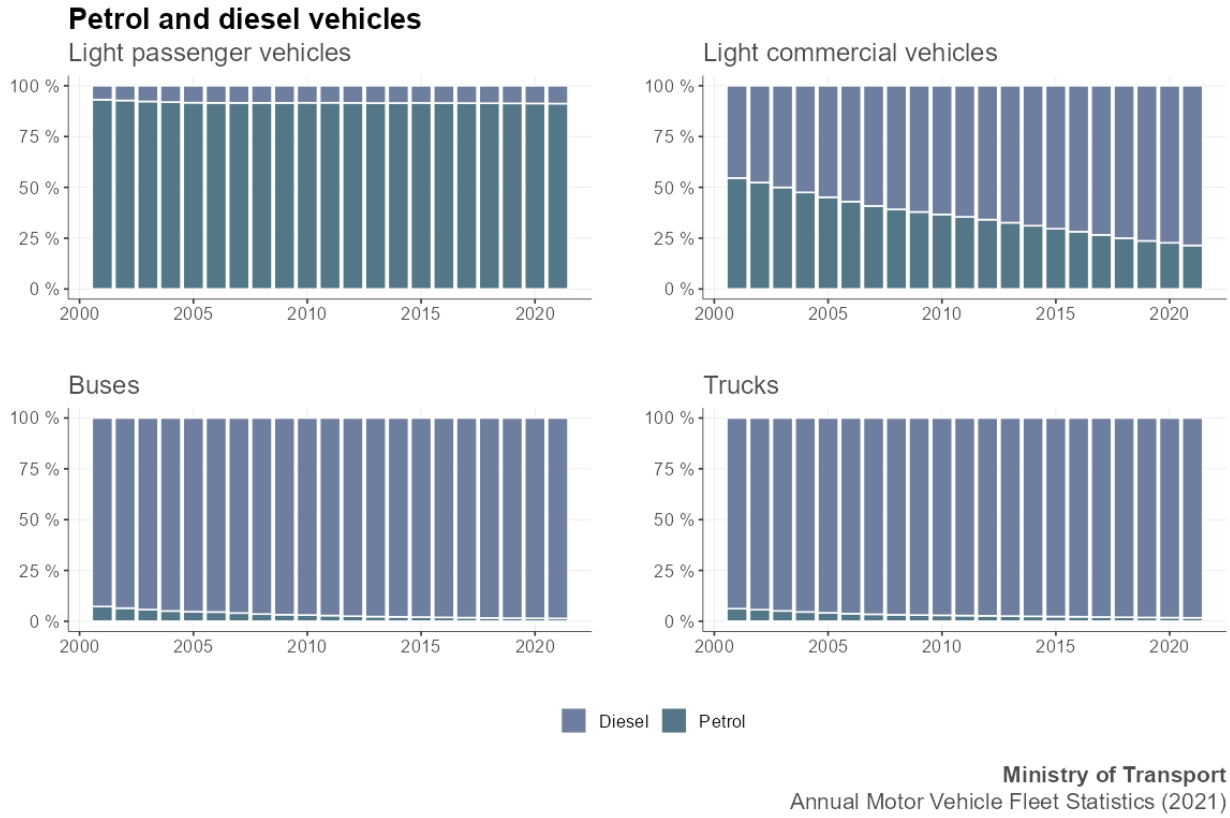

Figure 6: Contribution of petrol and diesel vehicles to the total number of petrol+diesel vehicles.

2.6 CO_2 emissions

> **Related ERP target**: reduce the emissions intensity of transport fuel by 10% by 2035 (ERP target 4 for transport).

Figure 7 shows reported CO_2 annual average emissions of vehicles entering the light fleet at years 2011 and 2021.

- In the past decade, reported CO_2 emissions of new petrol vehicles entering the fleet have decreased by around 21%. The main reason for this is the increase in the number of petrol hybrid and plug-in petrol hybrid vehicles in recent years.
- Reported CO_2 emissions of new diesel vehicles entering the fleet have decreased by around 5%.
- Average emissions of diesel vehicles are higher than petrol vehicles. This can be explained by the increasing popularity of diesel-fuelled LCVs (i.e. utilities and vans), which tend to be larger and heavier vehicles equipped with larger engines, and the low number of hybrid diesel vehicles entering the fleet.

- Average reported CO_2 emissions of vehicles entering the light fleet has decreased over time, but further reduction is required to meet the Clean Car Standard requirements.

We note that all CO_2 values quoted are according to the three phase Worldwide Harmonised Light Vehicle Test Procedure (3P-WLTP) (low, medium, and high speed phases). Where values are not available for the WLTP, the available values have been converted from available test results.

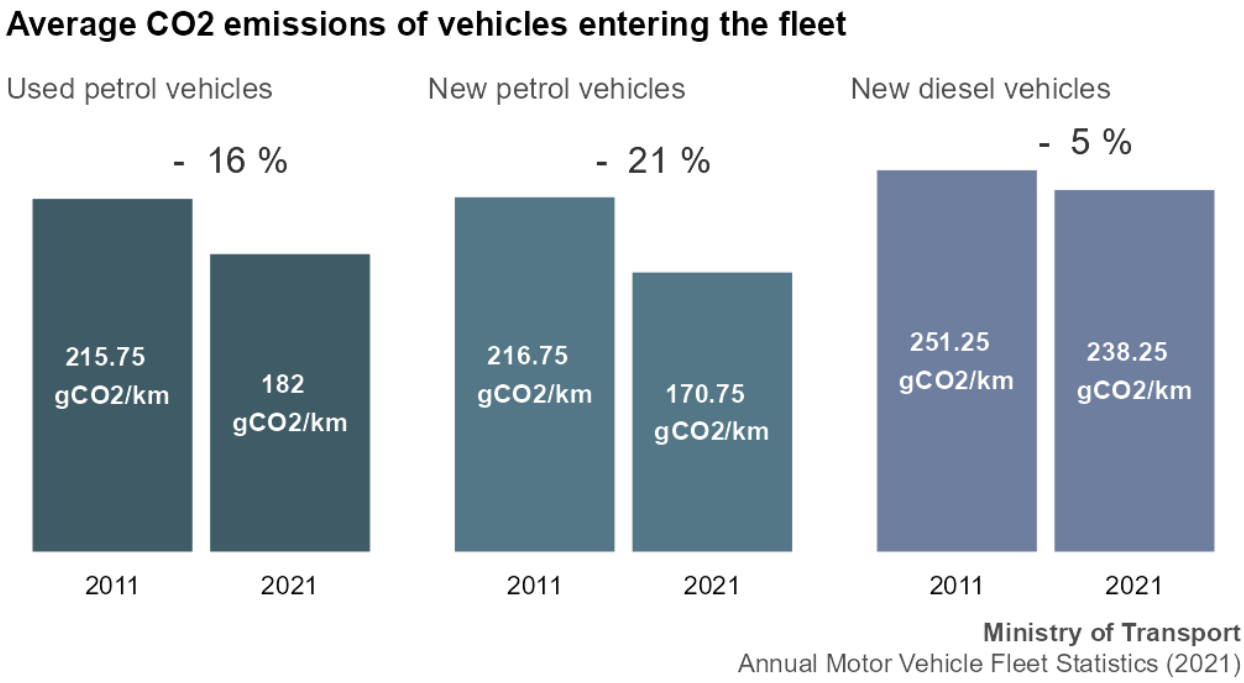

Figure 7: Reported CO_2 emissions of vehicles entering the light fleet

2.7 Road freight

> **Related ERP target**: reduce emissions from freight transport by 35% by 2035 (ERP target 3 for transport).

Figure 8 shows the trends for the most important vehicle characteristics that influence road freight transport emissions, i.e. tonne-km travelled, average age of trucks in the fleet, share of new (and younger) trucks entering the fleet, and fuel mix of trucks entering the fleet.

- Tonne-km of road freight are increasing.
- Average age of used trucks in the fleet have been increasing, whereas average age of new trucks in the feet has remained around 15 years old.
- The proportion of new trucks entering the fleet has been decreasing for the past 10 years.
- Trucks are predominantly diesel-fuelled. In 2021, 99.6% of trucks entering the fleet were diesel-fuelled and this value has been steady since the year 2000.

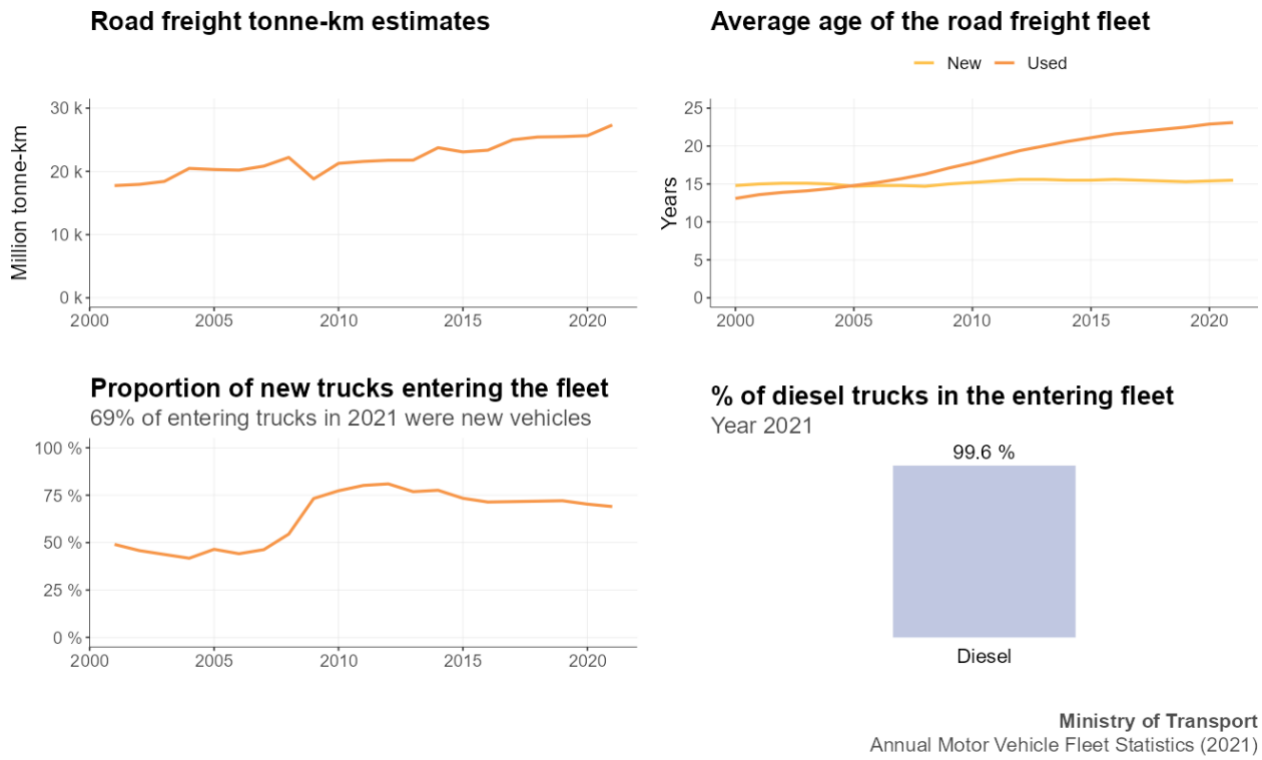

Figure 8: Trends for the most important vehicle characteristics that influence road freight transport emissions.

3 The interactive data tool

The open data tool is an interactive dashboard for exploring a subset of the available open data. The dashboard enables the user to choose a data category and drill down to a particular summary table. The specific summaries can be explored via an interactive visualisation or downloaded as machine readable .csv. A download of the complete open data, which includes many other summaries than those presented in the app, is also made available through the app.

The data categories include:

- Composition of the fleet
- Vehicle kms travelled (VKT)
- Vehicle age and engine capacity trends
- Vehicles entering and leaving the fleet
- Emissions of vehicles entering the light fleet
- Travel and load-travel of the road freight

All the plots are interactive, providing more information through hovering or clicking on plot elements, and can be downloaded.

4 Appendix

4.1 Classification of vehicles

The Ministry of Transport's (MoT) vehicle fleet statistics classifies road vehicles into five vehicle categories: light passenger vehicles, light commercial vehicles, motorcycles, heavy trucks, and buses. We note that this vehicle categorisation may be different from that found in the publications of Waka Kotahi. In some visualisations included in this report, motor vehicle categories have been further aggregated for clarity into: light vehicles, heavy vehicles, and other.

The table below shows the correspondence between the specific motor vehicle types used in the motor vehicle register, the Ministry of Transport's vehicle categories, and the broader categories used in this report.

Category in this report	**MoT vehicle type category**	**MVR vehicle type**	**Gross vehicle mass**
Light Vehicles	Light Passenger Vehicles	Passenger car/van	Up to 3500 kg
Light Vehicles	Light Commercial Vehicles	Goods van/truck/utility	Up to 3500 kg
Light Vehicles	Light Commercial Vehicles	Motor caravan	Up to 3500 kg
Light Vehicles	Light Commercial Vehicles	Bus	Up to 3500 kg
Motorcycles	Motorcycles	Motorcycle	
Motorcycles	Motorcycles	ATV	
Motorcycles	Motorcycles	Moped	
Heavy Vehicles	Buses	Bus (including minibus)	Over 3500 kg
Heavy Vehicles	Trucks	Passenger car/van	Over 3500 kg
Heavy Vehicles	Trucks	Goods van/truck/utility	Over 3500 kg
Heavy Vehicles	Trucks	Motor caravan	Over 3500 kg
Other	Miscellaneous	Mobile machine	
Other	Miscellaneous	Special purpose vehicle	
Other	Miscellaneous	Tractor	
Other	Miscellaneous	Agricultural machine	

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