



<air

OUR AIR QUALITY IS FANTASTIC
AND IS **THE ENVY OF THE WORLD**,
BUT SOMETIMES IT 'BOMBS' OUT



Air

Our air quality is fantastic. Mostly it is healthy, invigorating and the envy of the world. Sometimes, and in some circumstances, it ‘bombs out’ and it is hard to understand why we haven’t fixed it.

More than 90 percent of our country has clean air nearly all of the time, and its quality is stunningly good. It is good in the sense that, in most places, most of the year the air is fresh and suffers little from air pollution. The term ‘air pollution’ includes anything in the air that we don’t want, usually because it affects our health or the environment we live in.

Sulphur dioxide

Sulphur dioxide is the pollutant gas that can make acid rain. It can sting and cause breathing difficulties. We don’t have acid rain in New Zealand.

In New Zealand we have a legally binding national environmental standard for sulphur dioxide that means we will never have acid rain. And we will never have concentrations of sulphur dioxide that makes breathing difficult. Even for asthmatics.



PM₁₀ testing. Photo courtesy of Taranaki Regional Council.

Other pollutants and gases

Most other parts of the world have trouble with carbon monoxide, nitrogen dioxide and ozone. Whilst not being perfect, we have binding standards that mean they should never become a real problem in New Zealand.

‘Bombing out’ – soot

Where we ‘bomb out’ is soot. Tiny particles you can’t even see in the air that mainly come from heating our homes and our hot water with wood or coal. Some of it comes from smoky vehicles, especially in Auckland.

Our sooty air is found in about 20 or 30 towns or cities. Colder places are worst, including Timaru, Christchurch and Alexandra. The low-lying flat land of the Canterbury Plains is surrounded by hills that help trap a layer of soot over the city of Christchurch on cold days. Auckland’s air quality is also affected by winter home heating, but traffic pollution is a bigger contributor in this area.

Home fires

We really like our open fires. 38 percent of our homes use wood burners. 40 percent of domestic wood burners are more than 10 years old, and only one in four has been installed in the past five years. Older wood burners are less efficient and produce more smoke.

THE TROUBLE WITH SOOT

‘SOOT’ IS A NAME FOR FINE PARTICLES OF SMOKE. FINE SOOT PARTICLES ARE TINIER THAN THE WIDTH OF A HUMAN HAIR, AND THEY CAN BE BREATHED INTO OUR LUNGS.

They cause anything from coughing and wheezing to respiratory diseases, and even premature death.

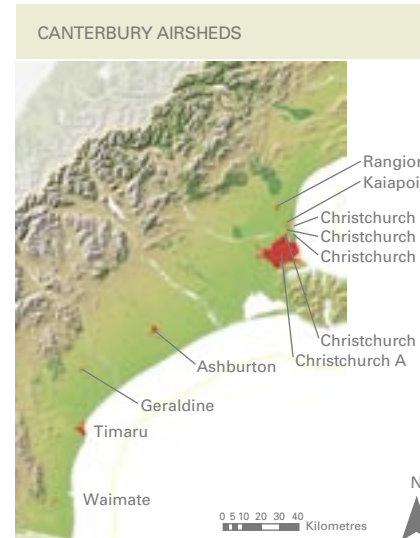
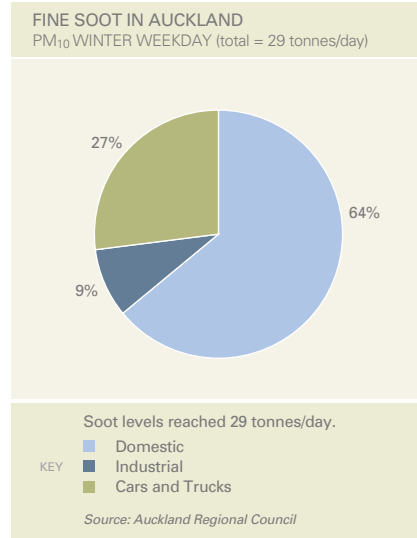
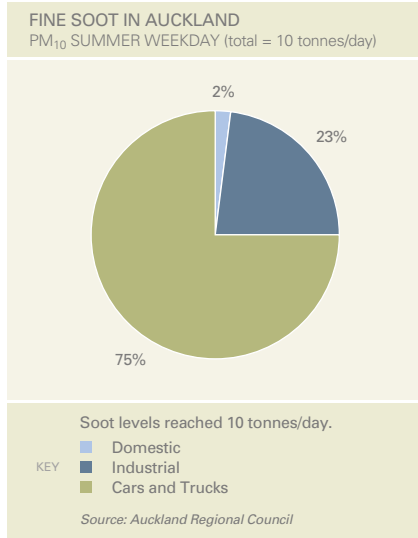
It is estimated that breathing airborne soot causes more premature death than road accidents.

Cars

Cars and trucks cause an air pollution problem in Auckland. Lots of cars with dirty exhausts, especially diesel ones often moving very slowly, is not good. Cars and trucks are a bigger proportion of Auckland’s problem in summer as there is little home heating.

Airsheds

The places in New Zealand that have problems with soot have been identified as ‘airsheds’. Within airsheds, regional councils are required to clean up by 2013.



Brilliant again – lead

New Zealand used to have a problem with lead. Lead in paints, lead in soldered food cans, but mostly lead in the air.

Lead in the air came from vehicle exhausts because we used to add lead to petrol to improve the octane rating. This was to improve engine performance and stop engine ‘knock’.

The lead in the atmosphere was bad, especially for children as it affected their nerve and brain development.

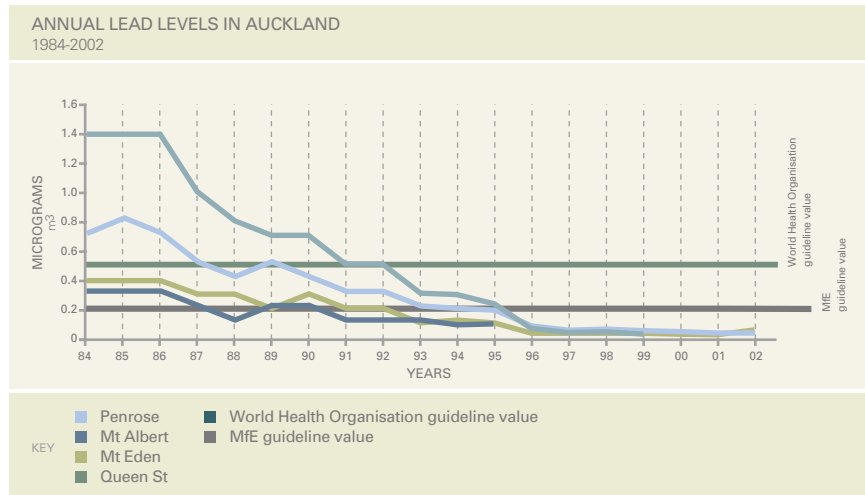
Today we ban lead in petrol, and lead in the atmosphere is no longer a problem. We refine the fuel a bit more to keep the engine performance.

Combined with the removal of lead solder from food cans, by 1998 our exposure to lead had dropped by more than 95 percent. There is no longer a health risk from lead when living next to a busy road. The graph shows lead levels at four busy Auckland sites (Penrose, Mt Albert, Mt Eden and Queen Street), between 1984 and 2002.

Getting rid of pockets of poison

Until recently we had some pockets of poison in amongst our clean air. We are getting rid of them.

For example, we used to renovate our bitumen road surfaces by burning off the road surface. The smoke and poison coming from this was awful. Now we have banned that practice. We have also banned other poisonous activities like fires in landfills and the burning of tyres in the open.



BANNED



ON THE WAY OUT

Photo courtesy of Greater Wellington Regional Council.

Some schools and hospitals had old fashioned incinerators. They produced foul fumes, including toxic dioxins, especially where plastic was burned. They are now on the way out. Unless they get special approval, they must go by October 2006. The Ministry of Education is running a “Bin it, don’t burn it” campaign, and is expecting to see a big reduction in the number of schools running incinerators.

Big breaths

Fill your lungs and feel good about it. Our air is world class.





<kiwi cars

NEW ZEALAND HAS A LOVE AFFAIR WITH CARS.

WE LOVE ALL TYPES OF CARS,

AND WE'RE BUYING MORE AND MORE



Kiwi Cars

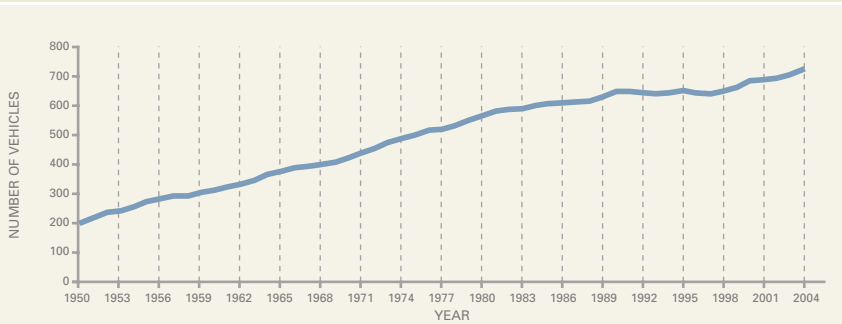
We love our cars. But not that long ago we had a 'third world' collection of old cars. In the 1960s, many New Zealand families could not afford a car. To buy a new car you needed overseas funds, or the patience to sit out a long waiting list.

If we could afford a car, it would be either tiny (think Morris Minors and Fiat Bambinas) or really big and bulky with masses of chrome (think Chevrolet Bel Airs and the Vauxhall Velox). We drove on narrow, winding and often unsealed roads with no safety belts, no safety glass, poor brakes and lousy handling.

Times have changed. We are now close to world leaders in car ownership, ranked fourth in a recent AC Neilson Survey. Only the United States of America, Italy and Australia have more cars per person than we do.



VEHICLES (INCLUDING CARS, VANS, TRUCKS, BUSES, MOTOR CARAVANS, MOTOR CYCLES AND MOPEDS) PER 1000 PEOPLE



Source: Ministry of Transport, 2005

Our car ownership has soared to 620 cars per 1000 people. We keep buying more – there are 230,000 new car registrations every year, seven times more than in 1960. About 70 percent of these are used imports.

Today, 92 percent of trips are by car. One-third of all car rides cover less than two kilometres, and two-thirds are shorter than 5 kilometres. It seems we don't like to walk.

A MOTORISED LIFESTYLE

IN 1960s NEW ZEALAND MOST CHILDREN WALKED OR CYCLED TO SCHOOL.

Now, being driven by car is the most common way of getting to both primary and intermediate schools. The number of trips has almost doubled from about 19 million trips in 1989/90 to about 37 million trips in 1997/98.

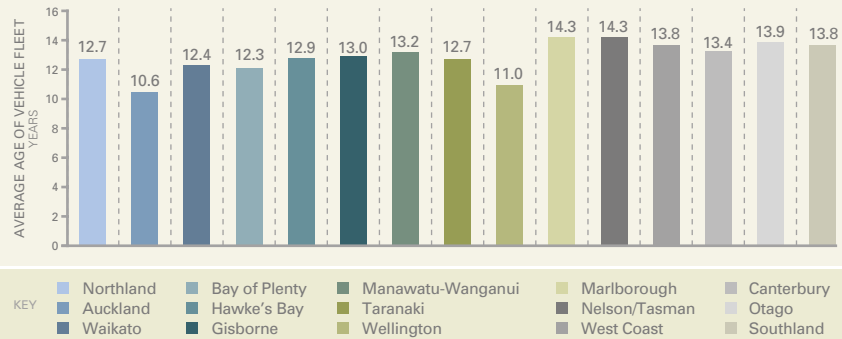
We love them, but what are our cars like?

The educated opinion of the car boffins in government is that we like big engines.

In the 1960s, a typical family car would have a 1.5-litre engine. By 1990, the average engine size was 2.4-litres. In 2005 it hit 3-litres. Our biggest selling brand-new cars in 2004 were 4-litre Ford Falcons and Holden Commodores starting at 3.6-litres, followed by the 1.8-litre Toyota Corolla.

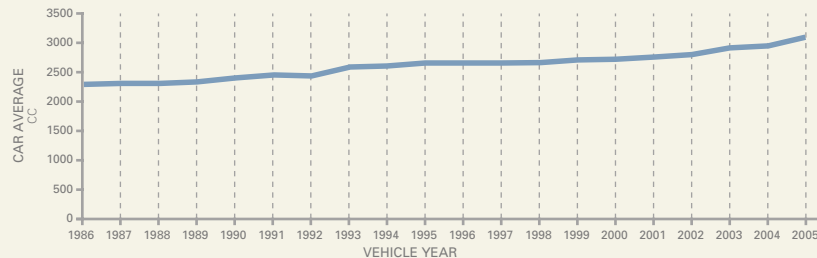
Some growth in engine size has been driven by manufacturers – models that began as small cars in the 1980s have evolved into medium or large cars. Take the Honda Accord – in 1986 the Accord was a 2-litre car that consumed 9.5-litres of fuel every hundred kilometres. In 2003, a standard model had a 2.3-litre engine and consumed 10-litres of fuel for every 100 kilometres. The V6 3-litre model consumes 11.5 litres of fuel over the same distance.

AVERAGE AGE OF VEHICLE FLEET BY REGION



Source: LTNZ; Covec analysis

INCREASING ENGINE SIZES



We hang on to our old cars for a long time. Because our cars are so old our vehicle fleet lags in efficiency and environmental technology. The average age of our vehicle fleet is 12 years and it's getting older. People in Nelson, Tasman and Marlborough hang on to their cars the longest – the graph on the previous page shows their cars have an average age of 14.3 years. The newest ones are on the roads in Auckland and Wellington – with average ages of 10.6 and 11 years.

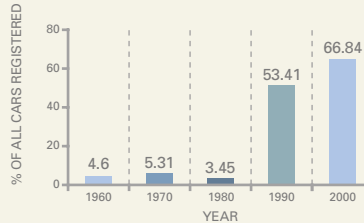
The big influence on the cars we drive has been the growth in imports of used cars. These make up 70 percent of all cars that roll off the docks. Used vehicle imports took off in the late 1980s when controls relaxed and duties and tariffs came off – in 1990, nearly five times as many arrived than just two years before.

Why is this important?

Why do we care what our cars are like? It's not just because we want to look good in them.

The age of our cars, their engine size, their history and the way we drive them impacts directly on the quality of our air and our greenhouse gas emissions.

PERCENT NEW REGISTRATION OF EX-OVERSEAS CARS



Source: Land Transport Safety Authority, 2005

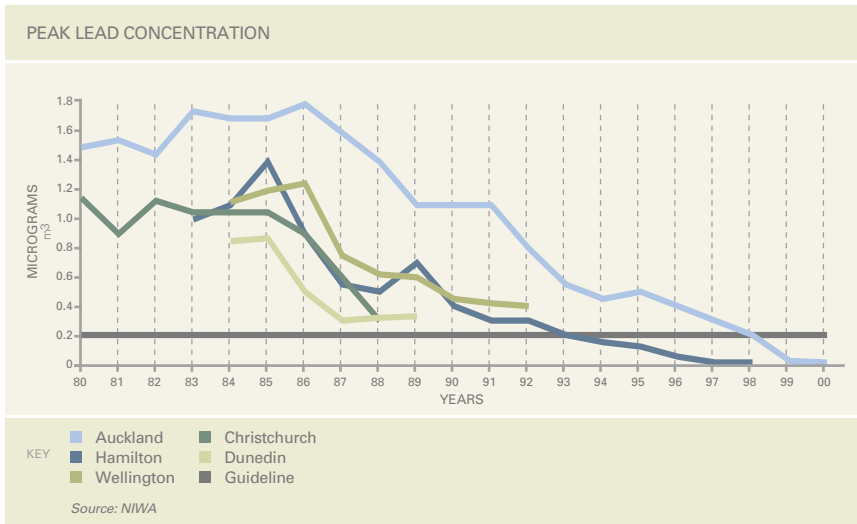


Petrol and diesel

In 1960, fuel was cheap, but it was poor quality. Now we can be pleased that it is much cleaner. Levels of lead and sulphur from fuels were previously so high that it was a significant health risk to live and breathe next to a main road. Lead in the air is a poison that causes nerve and brain damage in children.

We used to add lead to petrol to lift the octane rating – to maintain power and prevent engine knock. We began removing lead from petrol in the early 1980s, and it was completely removed in 1996. The huge rise in Japanese imports in the late 1980s was a big incentive, as for the first time we had cars that were designed to run on unleaded regular petrol.

The graph shows just how quickly lead levels in the air dropped once it was taken out of petrol and hence out of exhaust emissions.



Also, we are cleaning up sulphur in diesel. When car engines burn fuel containing sulphur it creates an exhaust of fine particles into the air, which causes respiratory problems and even premature death.

Since 2001, sulphur levels in diesel have dropped from 3000 parts per million to 50 parts per million – a 60-fold decrease. The aim is to have diesel with near-zero sulphur by 2009.



Where do old cars go to die?

About 125,000 vehicles are taken off the vehicle register each year. Of these, at least half are destroyed or permanently taken off the road; 13 percent because they've been written off by insurers. We abandon 25,000 each year, either on the sides of roads or out in nature, Cassells (2004).

We wear out three to four million tyres every year.

In 2004, a new voluntary collection scheme began called *Tyre Track*. In 2005, this scheme registered almost 1.3 million tyres. *Tyre Track* connects people with old tyres to people who want second-hand tyres and who will use them responsibly.





Photo courtesy of Toyota.

Moving forward

The EnergyWise Rally 2004, run by the Energy Efficiency and Conservation Authority and Motor Industry Association, pitched petrol-electric hybrids against lpg, diesel and petrol-powered cars on a round trip between Wellington and Auckland to allow direct fuel consumption comparisons to be made.

On fuel use, adjusted to take account of different fuel types, the Toyota Prius hybrid was first – with only 4 litres of fuel used for every 100 kilometres travelled.

Hybrid vehicles have a petrol engine and an electric motor, and recharge their batteries by capturing energy through regenerative braking. When cruising or idling, some of the output from the petrol engine is used to charge the batteries.

Many vehicle manufacturers have developed concept cars powered by hydrogen fuel cells, but their price puts them out of range for most of us at the moment. Fuel cells convert hydrogen fuel and oxygen pulled from the air into water, producing electricity in the process – this is what powers the vehicle.

In summary

We Kiwis now own more cars than most. We import large numbers of second-hand cars from Japan as they are quite affordable. Our cars have large engines and we keep them until they are old. Our fuels are much cleaner than they used to be.

With the continued price rise in fuel, will we be able to afford our love affair with the car or will we look differently at how we move goods, and ourselves, around? Will our love affair continue?

