



**All Party Parliamentary
Light Rail Group**
House of Commons
London SW1A 0AA
Light Rail & Trams, Affordable & Sustainable Transport

"The past we inherit, the future we build ourselves"



How dangerous is rubber dust?



Black mark: Each time a tyre rotates, it loses a layer of rubber about a billionth of a metre thick. (Source: rcyoung/iStockphoto)

In our modern cities, roads make up about one-fifth of the urban land area, and about half of the impervious surfaces. On these roads we have driven our cars and trucks with inflatable rubber tyres for over a century.

These rubber tyres wear, and have to be regularly replaced.

Sometimes the rubber comes off in a dramatic cloud of smoke when the car skids on the road.

Sometimes the road surface is sharp and slices fragments out of the rubber. But most of the time, in the course of normal rotation without skidding or cutting, the rubber is compressed and then expands.

As it compresses and expands, tiny cracks develop and spread in the tread — and tiny particles of rubber flake off.

These meetings are by invitation only, where MPs, Stakeholders etc., within the Light Rail industry and invited members of the Public will have a chance to discuss debate and raise questions concerning Light Rail

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How much rubber dust is there, where does it go, and is it harmful?

Each time a tyre rotates, it loses a layer of rubber about a billionth of a metre thick.

If you do some numbers, this works out to about four million million million carbon atoms lost with each rotation.

A busy road with 25,000 vehicles travelling on it each day will generate around nine kilograms of tyre dust per kilometre.

In the USA, about 600,000 tonnes of tyre dust comes off vehicles every year.

In the Australian outback, traces of lead from car exhausts have been found up to 50 kilometres away from the nearest road. So some of the tyre dust can travel that far — but of course, most of it will settle around the road.

Some of the tyre dust gets mashed into the road. Most of it gets blown off away from the road by the air turbulence of the vehicles.

Rain easily washes the rubber dust off the road into the nearest waterways where it ends up as sediment on the bottom of creeks, ponds and wetlands.

Tyre dust contains two main classes of chemicals — organic and inorganic.

These organic chemicals are especially toxic to aquatic creatures (such as fish and frogs), and depending on the levels, can cause mutations, or even death.

In test tube laboratory experiments, they damage human DNA. Latex (a component of rubber dust) has been implicated in latex allergies and asthma.

Some of the inorganic chemicals in tyre dust are heavy metals (such as lead and zinc).

But there's another dark side to rubber dust — particles.

The organic and inorganic chemicals are carried as, or on, particles.

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In general, the smaller the particles, the more deeply they can penetrate into your lungs. PM10 stands for particulate matter that is smaller than 10 microns in size. (A micron is a millionth of a metre. A human hair is about 70 microns thick). PM2.5 particles are smaller than 2.5 microns, and are even more dangerous.

On average, about 80 per cent of all PM10 in cities comes from road transport. Tyre and brake wear causes about three to seven per cent of this component. Each year in the UK, PM10s of all types are blamed for an extra 10,000 deaths, due to heart and lung disease.

In Europe each year, the normal wearing of tyres releases some 40,000 tonnes of PAHs (polycyclic aromatic hydrocarbons), mostly as PM10. PAHs are a component of the heavy oils used to make tyres.

They accumulate in living tissue, and have been implicated in various cancers.

California is notorious for its heavy smog pollution — which can vary from day to day.

One study showed very strong links between PM2.5 particles, and the daily death rate in six Californian counties.

When the PM2.5 count was high, so was the death rate.

Back in 1922, T S Elliot wrote his poem *The Waste Land*. In it appear these words: "I will show you fear in a handful of dust."

We don't need to be terrified of rubber dust just yet. But we do need to know how dangerous it is. Even today, after over a century of using rubber tyres, we are not still not sure of the exact health hazards of the rubber from the tread of tyres.

Luckily, modern tyres last much longer than they used to, so there's less tyre dust ending up in the environment

You still need a spare tyre, but it's better in your boot than around your waist — or even worse, in your lungs.

Courtesy: DR Karl Kruszelnicki, ABC Science
<http://www.abc.net.au/science/>

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