

# Road Transport, Air Pollution and Health

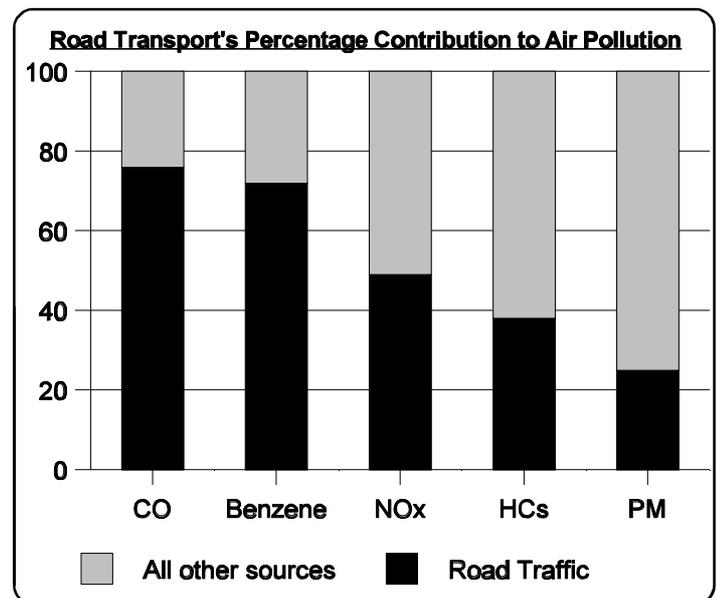
## Introduction

Very few areas of the UK are safe from air pollution. Pollution levels exceed Government health standards all over the country on many days every year, even in rural areas. The impact of this pollution is huge: even the Government now accepts that between 12,000 and 24,000 people die prematurely every year as a result of air pollution.

## Road transport's contribution to air pollution

Road transport is a major source of air pollution in the UK. The following chart shows the relative contribution of road transport and all other sources (other forms of transport, energy production, industry and domestic sources) to emissions of five key pollutants: particulates (fine dust and soot particles - PM), carbon monoxide (CO), nitrogen oxides (NOx), benzene and hydrocarbons (HCs) <sup>1</sup>.

But the chart does not tell the whole story. The contribution of road transport is higher still in towns and cities. In London, traffic is responsible for 99 per cent of carbon monoxide, 76 per cent of nitrogen oxides and 90



per cent of hydrocarbons <sup>2</sup>.

Also when pollution levels are high, the contribution of road transport is often greater. For example, analysis by Government experts shows that when particulate levels exceed health standards, then road traffic's contribution is in the range of 75-85 per cent <sup>3</sup>.

Road transport is also the main cause of ozone (summertime smog). Ozone does not come directly from vehicles or factories but is created by chemical reactions between other nitrogen oxides and hydrocarbons.

## Where is the problem worst?

Levels of nitrogen dioxide, carbon monoxide, hydrocarbons and particulates are highest in towns and cities, where there is more traffic. But this does not mean that rural areas do not have a problem. Levels of summertime smog are worst in rural areas. See the Friends of the Earth briefing sheet “Summertime Smog” for more details.

## Who is at risk?

The health of up to one in five people in the UK is particularly at risk from air pollution. These include young children, pregnant women, the elderly, and people suffering from heart and lung diseases.

## Health impacts

In a recent report, Government experts concluded that between 12,000 and 24,000 people might die prematurely every year as a result of short-term exposure to air pollution. The report added that a further 14,000 to 24,000 hospital admissions and readmissions may also be caused by this air pollution<sup>4</sup>.

One of the most well-known impacts of air pollution is an increase in asthma attacks. The incidence of asthma appears to have more than doubled in the last 15 years. Some of this increase may be due to changes in how doctors categorise asthma, but it is now widely accepted that the incidence of asthma has increased considerably. Asthma is the most common chronic disease of childhood with around one in seven children affected.

Evidence of a link between pollution and asthma is certainly accumulating, but there is no proof yet of a causal relationship. What we do know, however, is that pollution can aggravate asthma symptoms and can also trigger an asthma attack in people who are already asthmatic. There is evidence that use of asthma medication and hospital admissions diagnosed as asthma increase during severe pollution episodes.

Government health experts have concluded that “there is

a consistent, though modest, association between exposure to traffic and asthma prevalence in children”<sup>5</sup>. Other researchers have found that people living in streets with heavy traffic tended to suffer more illness than residents of streets with light traffic<sup>6</sup>. Similar studies in other countries have shown a relationship between the amount of traffic in an area and people with respiratory symptoms or wheeze<sup>7</sup>.

The pollutants which are of most concern in relation to asthma are ozone, particulates and nitrogen oxides. Mixtures of pollutants may also be particularly damaging.

There are several theories on how pollution might trigger asthma attacks. One is that ozone may damage the lining of the airways and allow other allergens, such as pollen or substances from house dust mite etc, to enter and thereby set up the allergic response.

But air pollution is only one suspected factor in the increased incidence of asthma. Many other factors, such as changes in domestic heating and ventilation, diet and exposure to cigarette smoke, have also been implicated.

There are many more potential health effects of air pollution from road transport. For example, the reaction of pollutants with natural sensitizers may also possibly underlie an increase in the incidence of other allergies, such as hay fever. Some pollutants, such as ozone and nitrogen dioxide may also increase our susceptibility to infection. Carbon monoxide can aggravate angina. Diesel and petrol exhaust fumes are considered respectively to be ‘probably’ and ‘possibly’ cancer causing. Car exhausts certainly provide the bulk of most peoples exposure to numerous toxic substances including 1,3-butadiene, benzene, formaldehyde and polyaromatic hydrocarbons, all of which are known or probable cancer causing substances.

To summarise, the health effects of particulates, nitrogen dioxide, carbon monoxide, benzene and ozone (of which hydrocarbons are a major precursor) are as follows:

**Particulates:** Consistent correlation between particle levels and death rates. High levels of particles have also been linked with increased hospital admissions and asthma attacks. Smaller particles can carry carcinogenic particles into the lungs.

**Nitrogen dioxide:** May aggravate asthma symptoms. Can cause a tightening of the chest and reduced lung function. Can make airways more sensitive to allergens such as house dust mite. By disrupting the body's natural cleansing mechanisms, nitrogen dioxide may increase the body's susceptibility to viral infections.

**Carbon monoxide:** Slows reflexes, impairs thinking and causes drowsiness by reducing the oxygen-carrying capacity of the blood. Can increase the likelihood of exercise-related pain in people with coronary heart disease.

**Benzene:** A known carcinogen which can cause leukaemia.

**Ozone:** Irritates the mucous membrane of the respiratory system, causing coughing, choking and impaired lung function, particularly in people who exercise. Other symptoms include headaches, eye nose / throat irritation and chest pain on deep breathing. Can make airways more sensitive to allergens such as pollen. Can also impair defences against bacteria and viruses.

Naturally, in everyday life, you don't just breathe in one of these pollutants. Every lungful of air contains a potentially toxic cocktail of pollution. Many scientists believe that there is a combined effect from the pollutants working together: breathing in one pollutant makes you more susceptible to the effects of another.

## How much does it all cost?

The impact of air pollution on health can also be assessed in monetary terms: the cost of health care, the cost of days of work lost, the economic cost of premature deaths. The National Asthma Campaign has estimated that asthma costs the UK over £1 billion per year <sup>8</sup>. Environmental economists have estimated the cost of air pollution from road transport at £19.7 billion per year <sup>9</sup>.

## Solutions: meeting health standards

The Government has set health standards for eight key pollutants <sup>10</sup>. For these pollutants it has also set policy targets to be reached by the end of 2005. Meeting these targets will need action locally, nationally and internationally.

Much of the responsibility for improving air quality has been passed to local authorities. Under a new system known as Local Air Quality Management, introduced in December 1997, local authorities will have to assess local air quality. If they think that the Government's policy targets for 2005 will not be met in their area, then they will have to declare an Air Quality Management Area and draw up an action plan to reduce pollution levels. Failure to meet these targets by the end of 2005 could see a local authority legally liable for not fulfilling its statutory duties.

If we are to meet the Government's targets for air pollution, then pollution from traffic must be cut drastically. There are two main ways to do this:

**Traffic reduction:** cutting the volume of traffic on the roads. Friends of the Earth was one of the organisations behind the Road Traffic Reduction Act 1997 and the Road Traffic Reduction (National Targets) Act 1998 (both of which are now law). The 1998 Act requires the Secretary of State to deal with the adverse effects of traffic.

In order to do this he must either set a national traffic reduction target, or set in chain other measures which must be assessed in terms of the traffic reduction they would achieve.

**Greener cars:** making sure that cars pollute as little as is possible. This is achieved through tightening engine technology and fuel quality standards. These standards are set at a European level. Friends of the Earth is calling for the toughest possible standards in the discussions currently taking place in Brussels.

## Public information on air pollution

The Government has a monitoring network of pollution monitoring stations around the country. Information from these monitoring stations is used to provide public information on air quality.

This information is available from a number of sources:

Freephone: 0800 556 677

CEEFAX: pages 410 - 417

TELETEXT: page 106

Website:

[www.environment.detr.gov.uk/airq/aqinfo.htm](http://www.environment.detr.gov.uk/airq/aqinfo.htm)

The Government launched its new air pollution public information system in November 1997. Pollution levels are described using four bandings: low, moderate, high and very high. These changes, which Friends of the Earth had been demanding for many years, mean that the public are now being given more accurate and meaningful information about pollution levels.

## What you can do

You can play your part in cutting air pollution from traffic:

- c Cut your car use. Use alternatives such as public transport, cycling and walking;
- c We are trying to encourage the Government to adopt policies which will deliver traffic reduction by encouraging MPs to sign Early Day Motions - on Company Car Tax, 'home zones' and CO<sub>2</sub> emissions. PLEASE WRITE TO YOUR MP, asking them to sign these motions. [edm's 1392; 1103 and 1226];
- c Join Friends of the Earth and help us campaign for traffic reduction and cleaner cars.

## Notes

1. Department of Transport: *Transport Statistics Great Britain 1996*  
[Benzene figures from: Department of the Environment *National Air Quality Strategy* (1997)]
2. The Ashden Trust *How Vehicle Pollution Affects Our Health* (1994)
3. Quality of Urban Air Review Group *Airborne Particulate Matter in the United Kingdom* (1996) page 146
4. Committee on the Medical Effects of Air Pollutants *Quantification of the Medical Effects of Pollution in the United Kingdom* (1998)
5. Department of Health: Committee on Medical Aspects of Air Pollution Episodes *Asthma and*

*Outdoor Air Pollution* (1995) paragraph 10.27

6. Whitelegg et al *Traffic and Health* report for Greenpeace Environmental Trust (1993)
7. Parliamentary Office of Science & Technology *Breathing in our Cities* (1994) paragraph 4.1.2
8. National Asthma Campaign *National Asthma Audit 1996*
9. Maddison, Pearce et al *The True Costs of Road Transport*
10. Department of the Environment *National Air Quality Strategy* (1997) chapter 3

Published: September 1997

Revised: March 1999

Friends of the Earth

26-28 Underwood Street

LONDON

N1 7JQ

E-mail: [info@foe.co.uk](mailto:info@foe.co.uk)

Website: [www.foe.co.uk](http://www.foe.co.uk)