

A Breath of Fresh Air

What you can do locally to decrease air pollution and achieve European air quality standards

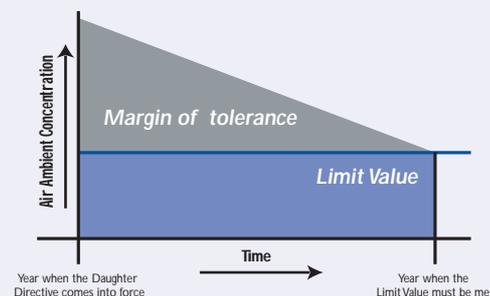
The negative impacts of air pollution on human and environmental health are now at the forefront of the political, social, and environmental debate. It is estimated that 75% of Europeans live in cities and at least 30-40% of them are exposed to average concentrations of air pollutants that exceed guidelines established by the World Health Organization¹. Air pollution in France, Austria, and Switzerland is responsible for 40,000 deaths a year². The Air Quality Framework Directive adopted in 1996 by the European Union (EU) sets a general policy framework for dealing with air pollution. In practice, the Directive is applied through a set of four pollutant-specific "Daughter Directives".

This fact sheet provides an overview of the first Daughter Directive, the role local groups and authorities must play in its context, and describe a variety of measures related to transport that local authorities can use to attain the objectives of the Directive. These measures will be illustrated with concrete examples.

The first Daughter Directive: what is it?

The first Daughter Directive sets air quality standards for four pollutants, namely: sulphur dioxide (SO₂), nitrogen oxides (NO_x)³, particulate matter (PM₁₀), and lead (Pb)⁴. It specifies limit values aiming to protect human health, which are to be attained within a specific deadline. In cases where the concentrations of pollutants are very high now, EU countries must prepare action plans showing how they will achieve the limit value. This is based on whether measured concentrations exceed the limit value plus a margin of tolerance. The margin of tolerance is expressed as a percentage of the limit value and differs for each pollutant.

FIGURE 1. MARGIN OF TOLERANCE IN RELATION TO LIMIT VALUE (REC)⁵



This figure illustrates the connection between limit value and margin of tolerance. If an air pollution value falls between the limit value and the margin of tolerance, it is expected that the limit value will be attained in due time with existing pollution reduction measures. If that value is above the margin of tolerance, however, authorities are expected to produce specific plans detailing how limit values will be met. The margin of tolerance decreases with time until it becomes 0 in the year the limit value must be met.



The first Daughter Directive establishes the exact principles for the monitoring of each pollutant. It says that air pollution levels and limit values must be reported to the public. In most countries, the monitoring network will be set up at the national level. However, the Directive also foresees local and regional authorities as having an important task in planning and informing the public. Local and regional authorities are required to come up with programmes to achieve pollutant limits and set up measures to improve the situation when limit values are exceeded. Although the deadlines set in the first Daughter Directive are in 2005 and 2010, it is crucial to start implementing air pollution abatement measures now. Where limits have been exceeded in 2001⁶, reports and plans must be completed by the end of 2003, meaning this work needs to be done immediately. Finally, it should be emphasised that this legislation is about air pollution, not emissions, and that the goal is not simply to decrease pollutant emissions but to ultimately have better air quality.

TABLE 1. SUMMARY OF LIMIT VALUES, DEADLINES, SOURCES AND EFFECTS OF POLLUTANTS IN THE FIRST DAUGHTER DIRECTIVE

	EU Limit Values and Deadlines ⁷		Sources	Health Effects ⁸
SO₂	1 hour average: 350 µg/m ³ by 2005	24 hour average: 125 µg/m ³ by 2005	Combustion of fuel containing sulphur (ex. maritime bunker fuel), metal smelting and other industrial processes	<i>Short term exposure:</i> breathing impairments, chest tightness, wheezing; reduced lung function <i>Long term exposure:</i> respiratory illness; alterations in lung defences; aggravation of existing cardiovascular disease
NO₂	1 hour average: 200 µg/m ³ by 2010	Yearly average: 40 µg/m ³ by 2010	Fossil fuel combustion (transport and power generation)	<i>Short term exposure:</i> narrowing of the airways, changes in lung function <i>Long term exposure:</i> increased susceptibility to respiratory infection; alterations in the lung; lung damage
PM₁₀	24 hour average: 50 µg/m ³ by 2005	Yearly average: 40 µg/m ³ by 2005	Fossil fuel combustion (transport and power generation,) vehicles travelling on unpaved roads, materials handling, crushing and grinding operations	Coughing, wheezing, shortness of breath; aggravations of respiratory conditions such as asthma; chronic bronchitis; lung damage; premature death
Pb	Yearly average: 0.5 µg/m ³ by 2010		Metals processing, leaded fuel (almost completely phased out in the EU, but still an issue in accession countries)	Adverse effects on kidneys, liver, nervous system and other organs; neurological impairments (seizures, mental retardation, behavioural disorders); high blood pressure and subsequent heart disease

This table shows that transport emissions, from initial energy extraction to final use, are highly responsible for SO₂, NO₂, PM₁₀ and Pb pollution. The measures described in this fact sheet will exclusively focus on transport because it is lagging behind other sectors in emission reductions. Air pollution has shown a strong correlation to traffic fluxes, especially in urban environments. Vehicle emissions and fuel quality standards have been tightened in response to air pollution issues, but these measures do not suffice. Indeed, while technical progress led to a decrease in air pollution, it has been offset by the strong growth in passenger and freight transport with a clear shift to motorised road and air travel.

A variety of measures are designed to foster better use of existing infrastructure, induce a shift to less environmentally damaging modes of transport, and reduce the need for travel. The distinguishing feature of these measures is that they are geared towards changing the behaviour of

transport users. Not only do these measures have an impact on air pollution, they also result in substantial secondary benefits such as less hazardous roads and fewer crashes, a reduction in CO₂ emissions, less noise, improved health, and decreased congestion.

10 THINGS your city can do to counter air pollution from transport

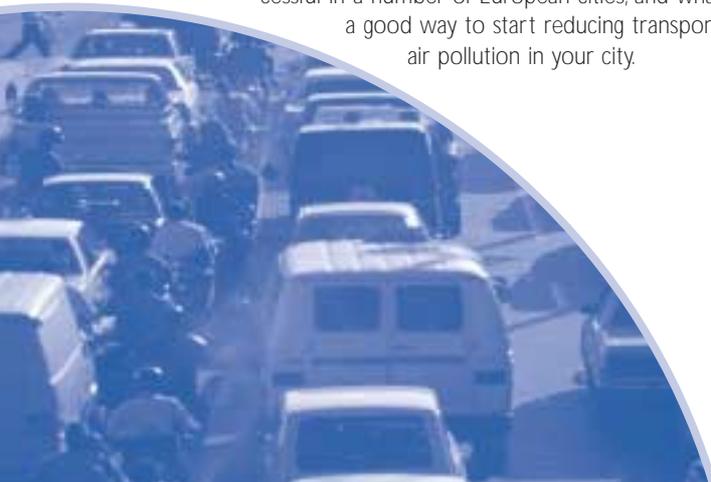
There are a variety of transport measures to improve air pollution that can be implemented at the local level. They can, for example, aim at improving traffic flows, decreasing the number of vehicles, increasing the attractiveness of sustainable modes of transport, altering modal shift, and reducing transport volume. Such measures, among others, are frequently integrated in an overall mobility management scheme addressing different modes, users, sites, or sectors, and being commonly developed by local authorities, transport suppliers, user organisations, car-sharing clubs, schools, businesses, etc. The more measures and the more partners there are, the greater the benefits for transport, health, and living environment. The examples below provide a brief overview of what has been successful in a number of European cities, and what can be a good way to start reducing transport related air pollution in your city.

► Car-sharing

Car-sharing is used to fill the gap created when public transport, cycling or walking are inadequate or unavailable. Mobility CarSharing in Switzerland, available everywhere in the country, has established partnerships with public transport and railway operators. The scheme provides an extensive fleet of cars so that participants can choose the type of car that meets their immediate needs. Cars can be booked by phone and Internet 24 hours a day and participants own an electronic chip card to access the cars. Overall, it is cheaper to combine car sharing and public transport use than to own a private car (www2.mobility.ch).

► Improving Public Transport

Measures to increase the attractiveness of public transport should be implemented as a package including aspects of availability, accessibility, reliability, pricing, safety, and comfort. Moreover, it has become increasingly apparent that public awareness of transport options plays an important role for people's modal choice. Mobility centres, such as the one in Prague, Czech Republic, provide free information on public transport. As the initiative has been successful, the goal is now for the centre to expand its services to include rail information and so on (www.dp-praha.cz). Four-fifths of the tourists in Málaga, the capital of one of the largest tourist areas in Spain and the EU, travel by car. The study of mobility management schemes resulted in the creation of a new tourist bus line, a tourist mobility plan and a mobility centre, as well as the provision of online tourist transport information (http://mo.st/index_msie.html).



► Cycling and Walking

The promotion of cycling and walking starts by considering them as means of transport. Considering that 50% of car trips in urban areas are less than 5 km, the provision of safe cycling and walking environments as well as sufficient cycle parking could diminish the reliance on motorised vehicles for this type of trip. To encourage walking, specific concerns such as the social environment and the perception people have of it need to be addressed. Simply put, people will not walk unless they feel safe. In the inner city area of Highfields in Leicester, UK, high crime and prostitution contributed to a disagreeable walking environment. Traffic calming measures accompanied by better street lighting and social programmes aiming to reduce prostitution resulted in walking becoming the main mode of transport (www.mobility-unit.dft.gov.uk/psi/psi12.htm). Projects can also be targeted towards specific groups, such as "COMET - Clever women on the move", which consists of hotlines for women using bicycles, bicycle maintenance and repair courses for women, organised excursions by bicycle in the city and the design of a CD-ROM (www.epomm.org/examples/one_example.phtml?id=65).

► Company-based Initiatives

When a company in Grenoble, France, realised that 80% of employees commuted alone in their cars to and from work everyday, it launched a travel plan including the provision of twice as many bicycle parking spaces, showers for cyclists and bus shelters at bus stops. It set out the specific objective of having 50% of employees using alternative forms of transport by 2005. A set of twelve additional measures were devised and consisted of, amongst others, bicycle repair on site, protected bicycle tracks and pavement around the site, payment of taxi or bus for cyclists in case of unexpected need, and 80% participation of the cost to employees of season tickets for urban and suburban transport (www.energie-plus.com & www.mobilitycentres.net).

► Land Use Planning

Land use planning measures can also be considered to counter air pollution. Because their benefits are long term, land use and accessibility issues should be worked out in planning strategies right away so as not to further delay their positive impacts. Policies of mixed land use are perceived as a way to reduce commuting distances, reducing the length of car trips as well as their number by encouraging cycling and walking. A residential area explicitly aimed at car free households was developed in Münster-Geist, Germany, 2.5 km south of the city centre. It includes services such as car-sharing, bicycle parking facilities and bicycle rentals, personalised annual public transport tickets for residents, timetable information, and home delivery to promote the car-independent lifestyle of residents. Residents will also benefit from reduced noise and pollution, enhanced quality of public space, improved traffic safety and lower charges for infrastructure (www.isis-it.com/transplus/doc/city.asp?nux=4).

► Road Pricing

In terms of cost-effectiveness, pricing measures are very efficient, as they are obvious and easy to implement. They should be accompanied by public awareness campaigns and information on the use of revenues to increase their acceptability. If the benefits derived from these measures exceed the costs, revenues could be reinvested into the same locality, thereby increasing welfare.

Using pricing measures to encourage public transport use greatly depends on local circumstances. Faced with rising debt and congestion, Hasselt city council in Belgium decided against building a third ring road and instead opted to provide free public transport. In addition, the frequency of buses was increased and the inner ring was converted to a bicycle and pedestrian path. As a result, bus ridership has increased by 800%, there are fewer accidents and road casualties, the more pleasant town centre has attracted business, there is an increase in social activi-

ty, taxes have been cut and the city's debt has been reduced (www.newrules.org/environment/hasselt.htm).

► Lower Urban Speed Limits

Establishing lower speed limits on city roads can reduce NO_x emissions by about 40%. Speed limit benefits also include secondary benefits such as less hazardous roads and reduced noise, which, in turn, promote other transport modes such as cycling and walking. While the impact of such a measure like "Tempo 30" depends on enforcement and the compliance of drivers, its effects are immediate (www.buwal.ch/bulletin/1998/f4a19501.htm).

► Restricting Access

Restricting access to certain areas is useful for diverting traffic from areas with poor air quality. The effects on the restricted areas are substantial and immediate. Restrictions can be set on a permanent basis for specific streets, pedestrian residential areas for example, or temporarily such as in the case of pollution alerts or during certain times of day. Temporary restrictions for more polluting vehicles can produce a reduction of NO_x emissions exceeding 40%.⁹

► Parking Management

Regulating and limiting the number of available parking spaces have been shown to have a significant impact on encouraging use of other modes of transport in various cities¹⁰. Indeed, it has induced a reduction in urban traffic volume of 10% to 20%, when additional efforts were made to improve alternative modes of transport. A study reported by Bovy (1998)¹¹, and focusing on French and Swiss cities, demonstrated the usefulness of managing parking spaces and showed a rough inverse correlation between the availability of parking spaces and public transport use.

► Park and Ride Schemes

Establishing park and ride schemes can be efficient in relieving sensitive city centres, but depends on the quality of public transport. Their success relies on the difference in travel times and costs between a car trip and a combined car-public transport trip. Empirical studies in Stuttgart show that if travel time and costs are the same for a car trip as for a park and ride trip, the share of park and ride users increases by 44% on certain routes. If travel time or costs are reduced by 10%, however, the share of park and ride users could increase to 64%¹². In Strasbourg, France, a park and ride scheme with bicycles was set up. The successful project was implemented with only a small investment and expanded as public interest grew (www.velo-strasbourg.com).

It should be stressed that using a single method addressing solely one aspect of the transport system will not achieve the desired outcomes and that a package of measures should instead be considered. Optimal packages are likely to include a combination of pricing, physical and organisational measures. Enforcement, which is self-financing, is key to the success of any measure.



Urban goods transport

Although trucks account for only 10% of all transport operations in towns and cities, they are responsible for 40% of the pollution and noise caused by local traffic. More than 80% of road freight trips in European cities and towns are on distances below 80 km¹³. These trips have a major impact on the local community in terms of economic power and quality of life. Several cities have established a city logistics scheme, setting up new partnerships and different types of cooperation between all those involved in the logistics chain and delivering/receiving goods in city centres. In Freiburg, Germany, there are 12 partners in the city logistics scheme who form an unbroken relay chain, one partner collecting the goods from the other for delivery to the city centre. As a result, total journey times were reduced from 566 hours to 168 hours per month, the number of truck operations reduced by 33% and time spent by trucks in the city decreased from 612 hours per month to 317, while the number of customers supplied and shipments made remained the same. In addition to the environmental benefits, these schemes also reduced the costs of all the companies involved (www.europa.eu.int/comm/environment/trans/freight). Certain cities have come up with very innovative initiatives, such as the "floating distribution centre" in Amsterdam, the Netherlands. The express courier DHL launched the idea of using a boat and bicycle couriers instead of vans. Consequently, 10 cars are removed from Amsterdam traffic every day, which amounts to 150,000 car kilometres and 120,000 litres of diesel each year (www.access-eurocities.org). In response to an increasing number of cars and vans creating congestion in the centre of Copenhagen, Denmark, the city had instigated a permit system for vehicles over 2,500 kg to enter the city. Three types of certificates are available and severe fines are imposed on those who park in the city centre without one (www.citygods.kk.dk).

Non-road transport contributors to air pollution

In a harbour town, for example, it may make sense to address SO_x and NO_x emissions from maritime transport in addition to road transport, since the port itself and shipping are likely to be important contributors to air pollution in the area. Currently, certain sea-based abatement strategies are more cost-efficient than land-based schemes. Similarly, aviation most likely greatly contributes to overall NO_x pollution in towns or cities with an airport. This trend is expected to increase parallel to the increase in air traffic, and can also shift to smaller regional airports as they expand to meet demand (www.earthisland.org/eijournal/win98/wr_win98demos.html). Citizens groups throughout Europe have been formed, attempting to offset these negative effects (<http://aef.org.uk>).

Don't let them tell you it doesn't work. IT WILL, IF YOU...

- Get as many people as possible to take part, create partnerships, set up alliances and implement measures as a package.
- Start with simple measures, follow a step-by-step approach, and concentrate on already existing measures to promote sustainable transport in your city.
- Target your efforts and concentrate on specific modes, trip purposes, users.
- Look for cities with similar problems and their ways of handling them, and get involved in networking and an exchange of ideas as well as good practices.
- Ensure first that the framework conditions in your city allow you to act and that there is sufficient political will to improve transport and air quality.
- Communicate the benefits, advantages and positive impacts of your campaign, and stress that they will help to improve the quality of life in your city.
- Consider the cost-effectiveness of different measures and implement the most cost-effective schemes first.
- Keep in mind that transport is to a large extent about behaviour and that any rational approach to alter transport patterns must also consider the emotional side of mobility.
- Finally, mobilise the public and emphasise the importance of community and individual awareness and engagement. Awareness campaigns aimed at increasing the sensitivity towards air pollution, provision of information on strategies to counter it, communication and public participation can be determining factors in the implementation of measures. Performing these before, during and after the implementation of any scheme can help to increase acceptance.

The ultimate goal of these strategies is to bring about a change in the public's behaviour away from an overwhelming reliance on the personal car to its endorsement of a less environmentally damaging and more sustainable transport system.

FOOTNOTES

- ¹ Air and Health, World Health Organization and European Environment Agency 1997.
- ² The Lancet 2000/Earth Policy Institute 2002.
- ³ For NO_x, limit values are set for the protection of ecosystems and vegetation; NO₂ is the targeted pollutant for human health and will be the one considered in this fact sheet.
- ⁴ The second Daughter Directive is on benzene and carbon monoxide and came into force December 13th 2000, the third on ozone appeared June 9th 1999, and the fourth on arsenic, cadmium, nickel, mercury and polycyclic aromatic hydrocarbons is being prepared.
- ⁵ Regional Environment Center (REC) www.rec.org.
- ⁶ This can be verified in the reports to the EU Commission due at the end of September 2002.

- ⁷ REC
- ⁸ United States Environmental Protection Agency www.epa.gov.
- ⁹ Auto Oil Programme II Working Group 5 (AOP II WG5).
- ¹⁰ AOP II WG5.
- ¹¹ Bovy, P. 1998. Introductory speech, Conference Urban Structure and Modal Split, UITP, Vienna.
- ¹² AOP II WG5.
- ¹³ European Conference on Mobility Management, 15-17 May 2002, Gent.

ADDITIONAL SOURCES OF INFORMATION

Air and Health (1997) World Health Organization, www.who.int and European Environment Agency, www.eea.eu.int.
Auto Oil Programme II Working Group 5, www.europa.eu.int/comm/environment/autool.
European air quality legislation, www.europa.eu.int/comm/environment/air/ambient.htm.
European Platform on Mobility Management, www.epomm.org.
International Council for Local Environmental Initiatives, www.iclei.org.

Lower urban speed limits (2001) T&E, www.t-e.nu.
Most Projects, <http://mo.st>.
Regional Environment Centre, www.rec.org.
Street Reclaiming (1999) David Engwicht, www.lesstraffic.com.
Traffic and Health (1997) T&E, www.t-e.nu.

T&E is Europe's primary NGO campaigning on a Europe wide level for an environmentally responsible approach to transport.
Contact: info@t-e.nu
www.t-e.nu

The EEB is a federation of more than 130 environmental citizens' organisations based in all EU Member States and most Accession Countries, as well as in a few neighbouring countries.
www.eeb.org

The Swedish NGO Secretariat on Acid Rain promotes awareness of the problems associated with air pollution, with the aim to bring about the needed reductions in emissions.
www.acidrain.org