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Benefits of improving urban air quality

Healthy air is vital for our cities and communities. By prioritising and co-ordinating action and measures in a range of areas which deliver on a number of policy objectives including climate change, health and greenspace, we can work together to achieve benefits that go beyond improving air quality.

Everybody is exposed to air. It is essential for human life and the quality of the air we breathe affects each of us to some extent.

Air pollution is one of the biggest direct environmental risks to human health,\(^1\) with short and long-term effects, such as asthma and respiratory disease. Overall, Scotland’s air quality is good when compared with some other parts of Europe; however, there are some places, where air quality is poor.\(^2\)

The highest levels of air pollution can be found in cities and towns. Unlike the dense smog of the 1950s, today’s air pollution is less visible, caused largely by a cocktail of pollutants emitted from vehicle exhausts. Fine particles of material (such as soot and unburnt fuel) can descend deep into the lungs where it can worsen asthma and heart and respiratory diseases.

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2. [www.environment.scotland.gov.uk/our_environment/air_and_climate/air_quality.aspx](http://www.environment.scotland.gov.uk/our_environment/air_and_climate/air_quality.aspx)
Improving local air quality through other measures

Legislation and policies to address air pollution will continue to focus on emission control and thereby reduce pollutants that are harmful to the environment and health. Along with the standard approach to dealing with air quality, there are other measures that can be introduced that will not only contribute to air quality improvements but will ultimately improve our overall urban environments.

The figure below shows the benefits that improving air quality through specific measures can deliver.

which helps contribute to the following:

Cleaner air
Nicer, safer places to live
Better health

as well as tackling the following issues:

Health and social inequalities
Climate change
Measure 1

Greening our cities

Green roofs on buildings, planting wildflower meadows, and creating new greenspaces, such as parks and allotments, can also contribute to improving air quality within our urban environment. Planting certain species of trees on empty land or on roadside verges, for example, can help in the removal of certain pollutants like ozone, nitrogen dioxide and particulates. In addition, trees also remove carbon dioxide from the atmosphere, therefore helping to mitigate against greenhouse gas emissions.

The benefits of greening our cities go beyond improving air quality

- Greenspaces and other environmental features in urban areas can help to reduce health risks from traffic, air pollution, noise and flooding. This can make cities more pleasant and vibrant places to live, supporting sustainable living and working, and improving wellbeing.
- Planting trees along roadsides can help to separate pedestrians from traffic, creating safer walking routes. It can also reduce the visual and noise effects of traffic as well as allowing vehicle pollutants to disperse from the road therefore reducing their concentrations in the atmosphere.
- Greenspaces can aid recovery from physical and mental problems, and guard against future illness, as well as increase mental concentration through contact with nature. They can also improve health through recreation, volunteering and learning in the outdoors.

3 www.who.int/mediacentre/factsheets/fs313/en/index.html
4 www.snh.org.uk/pdfs/strategy/healthevidence.pdf
Case study: Urban trees in the West Midlands

Following a study into the effect of planting trees on local air quality, researchers at Lancaster University were able to demonstrate the benefits that trees can have in urban areas.

Using information on trees in the West Midlands, local air quality data and computer modelling, they were able to show that trees are three times more effective at removing particulates from the air than an equivalent sized area of grassland.

Researchers were also able to estimate that by doubling the number of trees in the West Midlands, the concentration of particulates could be reduced by 25%. This alone could lead to 140 fewer deaths caused by airborne particles each year in the UK.

What can I do?

- Plant window boxes or add pots and planters to balconies and patios.

- Have a go at growing your own fruit and vegetables.

- Join an action group for your local park or gardens.
Active travel

Walking, running and cycling are healthy, environmentally friendly and inexpensive modes of transport, and can make a real contribution to improving local air quality. Encouraging and enabling such active travel choices, particularly when supported by a reliable, well designed and integrated public transport system is therefore an important tool in reducing pollution and achieving air quality objectives.

Active travel also has the potential to deliver other benefits for urban communities

- Research has found that each additional kilometre walked per day is associated with a 4.8% reduction in the likelihood of obesity, whereas each additional hour spent in a car per day is associated with a 6% increase in the likelihood of obesity.5

- Even low levels of physical activity reduce the risks of ill health. Major gains in terms of reduced mortality and morbidity are possible by raising the activity levels of those insufficiently active people—even slightly.6 Inactivity accounts for at least 2,500 deaths each year in Scotland; increased physical fitness would reduce premature death by 30%, could help prevent and treat more than 20 chronic diseases, and would increase life expectancy by almost a year.7

- Reducing vehicles on the roads reduces the risk of accidents, particularly accidents involving pedestrians and children, helping to create a safer urban environment.

5  www.ncbi.nlm.nih.gov/pubmed/17644231
7  www.scotland.gov.uk/Ressays/00411004115379.pdf
What can I do?

- Try cycling to work instead of taking the car – even cycling one day a week will make a difference.

- Encourage your kids to walk, scoot or cycle to school and leave the car at home.

- Get out walking – whether it's a trip to the park, the local shops or somewhere further afield.
Measure 3

Tackling health and social inequalities

Improving air quality is not just about improving health in general; it is also about targeting and addressing health inequalities. Air quality is likely to be poorer in some of the more deprived areas of our towns and cities. Those living in the dense, inner urban corridors along major routes into cities are those most likely to experience the poorest air quality. Reducing the number of people exposed to poor air quality in these urban areas would enable them to live longer, healthier lives.

- This would then help to reduce the number of hospital admissions for conditions that can be related to the effects of poor air quality, therefore saving time and money.

Tackling urban air pollution where it is worst and where people are most disadvantaged by it has the potential to deliver other benefits.

- Reducing the number of vehicles would lower the overall noise levels in urban areas, which can be a significant contributor to certain health problems. Over 945,000 Scottish people are exposed to daytime noise levels from traffic of over 55 decibels and 660,000 are exposed to noise levels of over 55 decibels at night. Noise pollution may be linked to reading and memory problems in children, and are associated with hypertension, sleep disorders and anxiety in adults.

- In 2012, 170 people were killed on Scotland’s roads, 1,959 were recorded as seriously injured and 10,446 suffered ‘slight’ injury. Of this, 1,950 pedestrians were injured (54 died), 898 cyclists were injured (9 died). There were also 1,161 children injured, 2 of which died.

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9 www.transportscotland.gov.uk/analysis/statistics/TrendRoadAccident
What can I do?

- Make use of park and rides when travelling into towns and cities.

- Join a car club – one car club car replaces over 20 private cars, reducing the number of cars on our roads.

- Get together with your neighbours to lobby your local councillor for 20mph speed limits and traffic calming measures in your street.
Measure 4

Tackling climate change

Some air pollutants contribute to climate change. As air pollution often comes from the same activities that contribute to climate change, tackling these activities together could help to improve local air quality and reduce emissions that contribute to climate change. For example, promoting low-emission vehicles, particularly in towns and cities, would lead to significant public health benefits through improvements in urban air quality, while also making a significant contribution to reducing emissions that contribute to climate change.

Black carbon: a case for integrating air quality, climate change and health considerations

Black carbon is the major contributor to fine particles that result from incomplete or inefficient combustion of fossil fuels and biomass burning. Within the urban environment, black carbon is particularly associated with the inefficient combustion of diesel. The number of diesel-powered cars and vans on our roads has increased significantly over recent years, with the proportion of new diesel cars sold rising from 14% to 46% over the last decade. Black carbon presents a serious threat to human health as particles are very small and can enter the deepest parts of the lungs; the smallest of these can pass through the lungs and into the blood. Black carbon particles often contain carcinogenic compounds (i.e. cancer-causing).

Black carbon is now thought to be the second largest contributor to global warming. In the atmosphere this pollutant contributes to climate change by absorbing heat, whilst at the polar regions it reduces the reflectivity of the snow. Although black carbon is considered to be short-lived in the atmosphere when compared to carbon dioxide, evidence suggests that it contributes between 20 to 50% of the warming effect of carbon dioxide.
What can I do?

- Use public transport for shorter journeys and leave your car at home.

- Become a fuel efficient eco-driver by reducing your speed, keeping your tyres at the correct pressure and turning off your engine if you have stopped for longer than a minute.

- Next time you buy a car consider a low-emission model or a car that uses alternative fuel.
Making the case for the environment
Where does SEPA fit in?

When it comes to tackling urban air pollution everyone, from government and local authorities to the general public, has an important part to play. At the Scottish Environment Protection Agency (SEPA) we are working to understand and improve air quality in Scotland. For example, we advise local authorities on their action plans in relation to air quality management.

We regulate emissions to air from industrial installations, as well as ensuring that installations meet climate change responsibilities. We are a key agency in the planning process in Scotland, providing environmental advice to local authorities to help make sure that proposed developments are in compliance with the appropriate air quality standards. We are committed to improving the environment through our duties and in showing how this can result in benefits in other areas.