

Scottish Wildlife Trust

Briefing



Ministerial Statement:

Air Quality: Delivering Improvements for Public Health and the Environment:

Improving air quality through green infrastructure and planning for low carbon, walkable, cycle friendly places

Headlines

- Air pollution reduces the life expectancy of every person in the UK by an average of 7-8 months with an associated cost of up to £20 billion each year.¹
- Air pollution disproportionately affects the most vulnerable members of society, including the very young, the elderly, people with existing medical conditions and those living in deprived urban areas.²
- In Scotland in 2010, fine particulate matter was associated with around 2,000 premature deaths and around 22,500 lost life-years across the population.³
- Carefully designed green infrastructure (street trees, green roofs and walls, urban parks, urban woodlands, allotments and other greenspaces) in urban settings can help combat poor air quality - as well as having other health and wellbeing benefits.⁴
- The Scottish Government wants future updates and revisions to Scottish Planning Policy and the National Planning Framework to take account of *Clean Air For Scotland* – the Trust believes updates should include the recognition of the importance of ‘designing in’ high quality green infrastructure.
- The Scottish Wildlife Trust wants Scotland’s planning system to facilitate better planning decisions to improve air quality such as:
 - (i) giving as much consideration to designing in the ‘green’ as well as the ‘grey’ elements *from the outset* in new settlements/developments
 - (ii) ensuring developments are located close to low carbon transport hubs to make it easy and attractive for citizens to walk, cycle or use low carbon travel options for work and leisure.

How does green infrastructure improve air quality?

Green infrastructure - such as trees, grass, sedum and other green roofs, green walls, shrubs, hedges and herbaceous plants - traps airborne particulate matter (PM₁₀) and other atmospheric pollutants like sulphur dioxide, nitrogen oxides (NO_x) and ozone. Thus, urban greenery can provide public health benefits by helping reduce the amount of atmospheric pollutants that adults and children are exposed to from road traffic and industry, which helps reduce the incidence of respiratory illness and cardiovascular disease amongst the population.⁵

Evidence:

- One hectare of mixed forest can remove 15 tonnes (t) of particulates per year from the air.⁶
- A study showed green roofs near a traffic corridor exhibited a significant improvement of air quality and the quantity of fine particles emitted from vehicle sources decreased by 24%.⁷
- Another study calculated that green roofs in a major American city removed 85 kg of pollutants (ozone making up 52% of the total, nitrous oxide (27%), PM₁₀ (14%), and sulphur dioxide (7%)) per ha of green roof.⁸
- Trees help remove sulphur dioxide, nitrogen oxides and ozone pollutant gases; broadleaves take up more than conifers.⁹
- A study which looked at asthma prevalence in 4–5-year-old children in New York found that the presence of street trees was associated with a 29% reduction in early childhood asthma.¹⁰
- A study showed that a scenario comprising 75% grassland, 20% sycamore and 5% Douglas fir was estimated to remove 90.41 t of PM₁₀ per year.¹¹
- Woodlands collect three times more PM₁₀ than grassland.¹²
- Green walls can improve air quality from both local emission sources and background concentrations (and may be a better option than trees where ‘street canyon effects’ exist).¹³
- Recent modelling has shown that Glasgow’s air quality could be improved by planting more street trees to filter out harmful particulate matter (PM₁₀) reducing costs to the NHS and improving quality of life.¹⁴

Planning can help by:

- Creating policies to ensure new urban developments are transit-orientated and low carbon (e.g. an urban development that maximizes the amount of residential, business and leisure space within walking distance of public transport)
- Revising Scottish Planning Policy (SPP) so that the ‘shoulds’ regarding green infrastructure, natural environment, designated sites and woodlands become ‘musts’ - otherwise there will be no step change to protect and improve the quality of green infrastructure being delivered by developers¹⁵
- Ensuring all planning decisions account for, and reduce impacts, on local/national air quality
- Making green roofs mandatory for new developments such as schools, office buildings, multiple occupancy dwellings (e.g. flats), retail parks, town and city centre developments
- Using tools to measure the quality and quantity of green infrastructure in development (e.g. the Trust’s Natural Capital Standard for Green Infrastructure). Low scoring developments in areas of poor air quality must be made greener to gain planning consent.
- Ensuring the next National Planning Framework includes a National Ecological Network as a national development.

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¹ Statement from <http://www.scottishairquality.co.uk/air-quality/>

² *Ibid.*

³ Cleaner Air for Scotland <http://www.gov.scot/Resource/0048/00488493.pdf>

⁴ Jana Söderlund and Peter Newman 2015 *Biophilic architecture: a review of the rationale and outcomes*. Environmental Science 2(4): 950-969.

⁵ Urban green spaces and health. Copenhagen: WHO Regional Office for Europe, 2016.

⁶ Findings taken from Forest Research benefits of Green Infrastructure Evidence Note.

⁷ Abhijith et al. 2017 Air pollution abatement performances of green infrastructure in open road and built-up street canyon environments – A review, Atmospheric Environment doi: 10.1016/j.atmosenv.2017.05.014.

⁸ Yang et al 2008 Quantifying air pollution removal by green roofs in Chicago Atmospheric Environment Volume 42, Issue 31, Pages 7266-7273.

⁹ Findings taken from Forest Research benefits of Green Infrastructure Evidence Note

¹⁰ Lovasi et al 2008. Children living in areas with more street trees have lower prevalence of asthma. *Journal of Epidemiology and Community Health* **62** (7), 647–649.

¹¹ Findings taken from Forest Research benefits of Green Infrastructure Evidence Note.

¹² *Ibid*

¹³ Abhijith et al. 2017 Air pollution abatement performances of green infrastructure in open road and built-up street canyon environments – A review, *Atmospheric Environment* doi: 10.1016/j.atmosenv.2017.05.014.

¹⁴ UK National Ecosystem Assessment (2011) page 386.

¹⁵ See Sections 194 - 233 in current SPP.