

# Greener but not cleaner? How trees can worsen urban air pollution

August 3 2015, by John Gallagher

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Trees have their uses. Credit: Franck Robichon / EPA

No one enjoys choking on smog, but are more trees really the answer for polluted city air? It's not as clear-cut as you might think. Air pollution is clearly a problem for health and well-being – and as more and more people across the world move to live in megacities, they could miss out

on the fresh air associated with the green countryside.

So far, many strategies have been put in place to try and mitigate urban [air pollution](#): from introducing [congestion charges](#) to imposing [car bans](#), promoting [electric vehicles](#) to providing more [car-free zones](#). One group has even [suggested](#) making London a "[national park city](#)". If you can't escape to the countryside, then you can instead bring the countryside feel to the city.

Urban planners seem to be increasingly focused on promoting more green spaces in our towns and cities, creating a truly "urban jungle".

## **More trees for everyone**

Why not? After all, trees really do make you feel better, according to recent research published in the journal [Scientific Reports](#). The study, in Canada, found ten extra trees in a city block meant local people's health perceptions improved an amount comparable to being given a US\$10,000 raise or suddenly being seven years younger. One of the reasons for this, the researchers suggested, was that "trees reduce air pollution".

No one can deny that finding a quiet space in a bustling city is challenging, and that city parks offer a place for you to catch a breath of fresh air.

Thus given how trees improve our wellbeing, supporting the concept of making a city greener seems like a no-brainer ... right?

## **Less fresh air for pedestrians**

Work in which I have been involved considers how air flows in and

around city streets, dispersing vehicle emissions on innocent pedestrians and cyclists. If you consider any [wall](#), [parked cars](#), [hedges or trees](#) as barriers that cause the natural pattern of air flow to be diverted, then you can see how trees may not always point transport pollutants in the "right" direction.

On the extreme side of things, your typical street with avenue trees, can almost lead to a "green" roof effect, when the canopy is in full bloom. This can prevent pollutants from escaping the street and air quality can be greatly impacted.

A tree canopy looks nice, but where is the air pollution supposed to go?  
[Brian Hillegas](#), [CC BY](#)

In less extreme circumstances, a single tree in a street corner may break the wind flow and lead to pollution dropping into the breathing zone of pedestrians walking by.

To cut a long story short, trees can be as detrimental to air quality as a Slipknot concert in your apartment is to noise pollution. It's all about their location.

## **Carbon dioxide is not the main health risk**

Carbon dioxide is usually labelled as the "bad guy", and it is – in terms of climate change at least. However when it comes to our health the range of other pollutants emitted from cars such as nitrogen oxides (NO<sub>x</sub>) and particulate matter (PM) present the greatest risk. Young children, the sick and the elderly are particularly vulnerable to harmful gases and particles released by fuel combustion in cars, lorries and buses.

Whatever impact trees may have on reducing [carbon dioxide](#) in cities, how they may, or may not, control these other pollutants is [not too clear](#).

The importance of trees is not in question, as protecting our green spaces is vital for the environment on a global scale. However, if we choose to plant trees in our city streets, at a local level, the outcome on air quality may be somewhat different. It is important to consider the type of tree you wish to plant, the shape of the street, what direction the wind blows, and where your pollutant source (cars) and receptors (pedestrians) are located.

Work by a Belgian research group entitled "[Improving local air quality in cities: to tree or not to tree?](#)" (... that is the question) sums things up. Sometimes, planting trees in cities is driven by people who may be informed of the benefits, but not all of the facts. I just want to make sure all the facts are looked at to make a well-informed decision. It's what research is about.

It is the responsibility of [urban planners](#) and local authorities to ensure trees are not just planted where they look nice, but perhaps where they can do more good than bad for [air quality](#) on city footpaths.

I'm in no way saying trees in cities are bad, they do add some colour to our otherwise grey landscape, but I will say that "terms and conditions apply". Before planting those urban trees, make sure you read the small print.

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