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Noise-cancelling windows halve traffic sounds even when they're open

TECHNOLOGY 9 July 2020

By [Donna Lu](#)



A grid of speakers facing outwards can play sounds that cancel out traffic noises

Danil Roudenko / Alamy

People living in cities with warm climates face a problem during summer months: keeping windows open for ventilation means letting in traffic sounds. A noise-cancelling device could solve this dilemma.



through an open window by up to 10 decibels.

To cancel out road noise, the researchers used 24 small loudspeakers and fixed these to the security grilles of a typical window in Singapore in an 8×3 grid. These grilles are a common feature across South-East Asia, says Lam. He adds that the spacing of the speakers was dependent on the frequency of the noise that they wanted to cancel out.

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The team placed the window in a replica room and played road traffic, train and aircraft noise from another loudspeaker 2 metres away. The frequency of most of the **noise** from traffic and passing aircraft ranges from 200 to 1000 hertz. Large trucks and motorcycles tend to generate sounds on the lower end of the range, while the majority of the sound from motorways is around 1000 Hz.

Read more: [Living near noisy roads could make it harder to get pregnant](#)

The researchers spaced each speaker 12.5 centimetres apart facing outwards and programmed them to emit sounds at the same frequency of noise detected by a sensor placed outside the window.

The device was most successful at cancelling noise between frequencies of 300 and 1000 Hz, with up to a 50 per cent reduction in loudness for sounds within this range. It isn't optimised for the noise from human voices, which have higher frequencies.

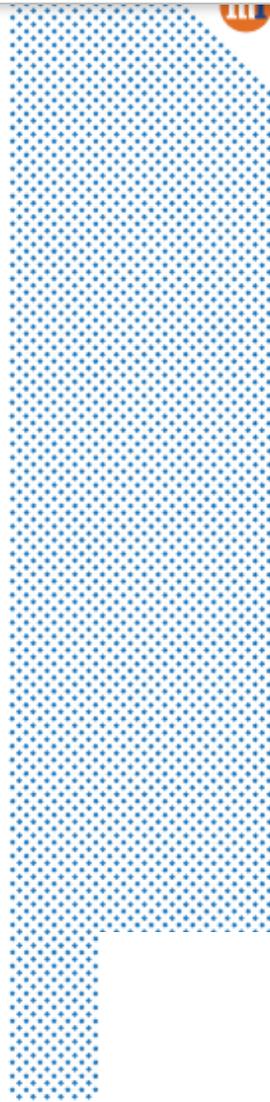
The effect is similar to the technology used in [noise-cancelling headphones](#), which are often tuned specifically to cancel out the hum of aircraft engines, says Lam.

The speakers the team used were only 4.5 centimetres in diameter – too small to cancel out noise at frequencies below 300 Hz. “A speaker needs to move a huge volume of air for low frequency sounds,” says Lam.

Having larger speakers is a possibility, but risks blocking out too much of the view from a window. The team plans to test a prototype in real-world experiments.

Journal reference: *Scientific Reports*, DOI: [10.1038/s41598-020-66563-z](https://doi.org/10.1038/s41598-020-66563-z)

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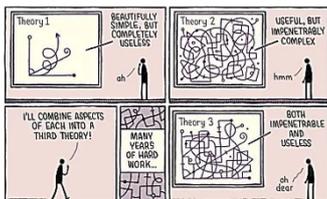


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