

Reducing noise transmitted through an open window

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A new device that can reduce the intensity of sound passing through open windows is presented in a proof-of-principle study in *Scientific Reports*. It fits into a two-panel sliding window and can decrease the perceived loudness of urban transportation noises by up to half (10 decibel reduction).

The device, assembled by Bhan Lam and colleagues, consists of 24 loudspeakers (each 4.5 cm in diameter), fixed in a [grid pattern](#) to bars attached to the inside of a window and one sensor located outside the window. If the sensor detects noise outside the building, the loudspeakers emit "anti-noise" at the same frequency as the detected noise but with inverted [sound waves](#). This "anti-noise" cancels out the detected noise and reduces the volume of noise pollution entering the room, even when the window is open.

The authors tested their device by placing it in the window of a replica room and playing [road traffic](#), train and aircraft noises from a loudspeaker two metres away. 18 microphones inside the room detected changes in sound, before and after the noise control device was activated. The authors observed up to a 10 decibel noise reduction for sounds with a frequency above 300Hz, such as traffic and train noises.

The findings demonstrate that the device was successful in reducing the volume of noise transmitted through an open window. The authors hope that it could be used to reduce [noise levels](#) entering through an open window, while keeping homes ventilated, and could improve the health of people living in cities.

More information: Active control of broadband sound through the open aperture of a full-sized domestic window, *Scientific Reports* (2020). DOI: [10.1038/s41598-020-66563-z](https://doi.org/10.1038/s41598-020-66563-z)

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