

AROUND THE HOME

Noise-canceling windows soften the sounds of the city



Michael Irving | 4 hours ago



The noise-canceling windows may be bulky, but they do a decent job of cutting external noise pollution (Credit: Nanyang Technological University, Singapore)

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Sometimes there's nothing like a nice breeze from an open window, but in the city that can come with an unwanted side order of street noise. Inspired by the kind of noise-canceling tech used in headphones, researchers at Nanyang Technological University, Singapore (NTU) have developed a window-based system that can actively cut noise coming from outside.

Noise-canceling systems don't just block sound, they actively counter it with their own sound waves. These devices use a microphone to listen to incoming noise, before algorithms analyze the waveform and generate an inverted version that is then emitted through speakers. When the two sounds converge, the ambient noise from outside is dulled, saving the listener from the honks of traffic or the endless hammering of construction sites.

This kind of active noise-canceling technology is already widely used in [headphones](#), [ear plugs](#), [motorbike helmets](#), [cars](#), and even [anti-snoring devices](#). Now, the NTU team is aiming to stick it in windows too.



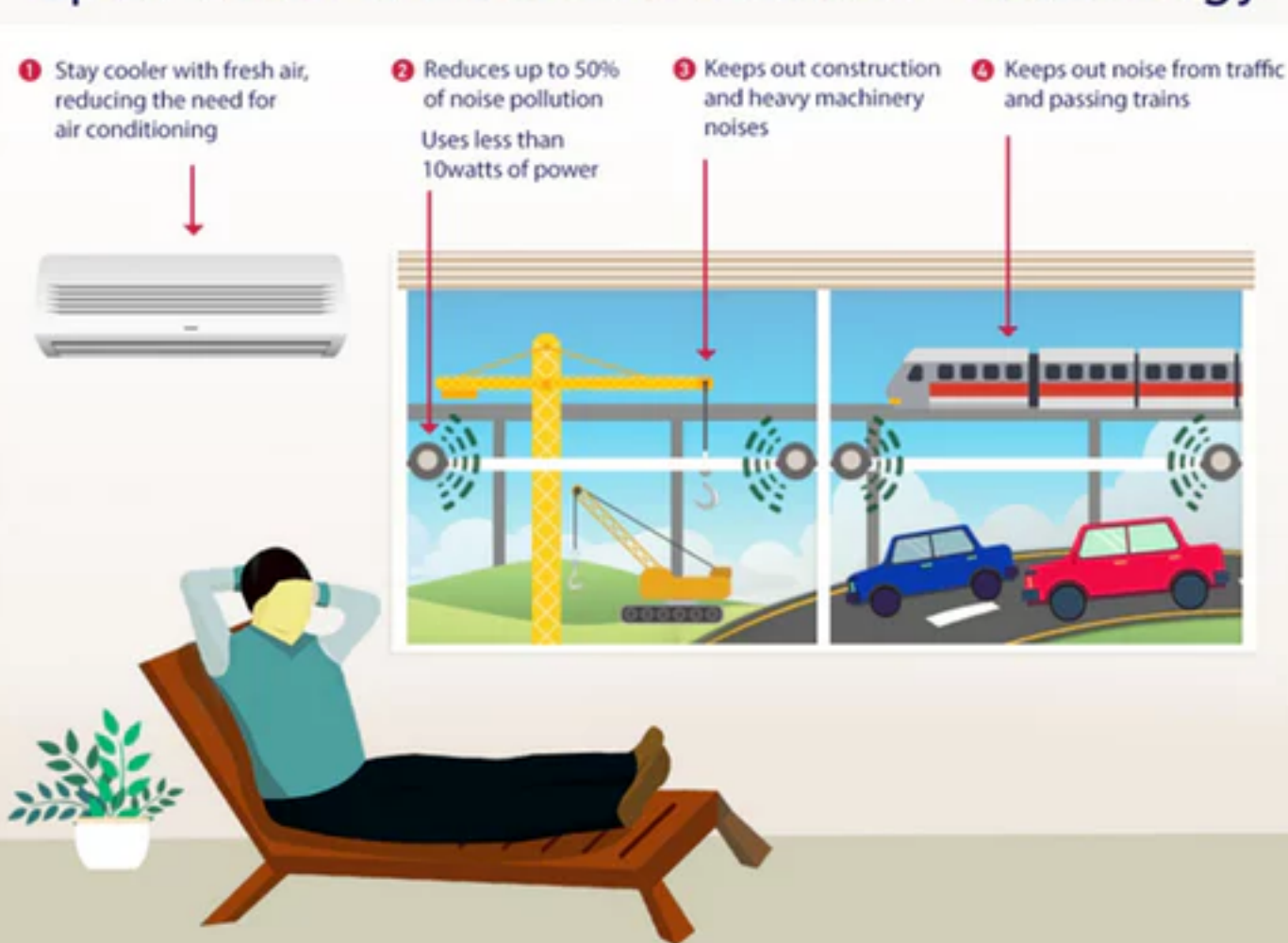
The prototype system is made up of a grid of devices that each contain a microphone, a speaker and a processing unit. Fitting over a window grille, this active array is able to detect noise before it reaches the window, and process the sound in real-time.

"Compared to noise cancellation headphones, what we have achieved is far more technically challenging as we needed to control the noise in a large open area, instead of just around the ear," says Gan Woon Seng, lead researcher on the project. "Our innovation not only computes the right amount and type of 'anti-noise' to emit, but also does it faster than the detected noise can reach inside the building."

To test the system, the team built a replica room, complete with windows and doors, inside a soundproof chamber. The prototype was attached to the window, and to emulate outside noise, a speaker was set up to play recorded sounds like construction work and passing planes, trains and automobiles. The researchers say it managed to reduce the noise by up to 50 percent.



Open Window Noise Cancellation Technology



Although the system cuts back on noise pollution, in its current form it adds a fair bit of "visual" pollution to your window. The researchers say that reducing the bulk is one goal of further work, as well as improving cost and noise-canceling efficiency.

"We are currently finding ways to improve the technology further so that it can be used not only at window grilles with large openings, but also provide a cost-effective solution that can be easily installed and replaced," says Gan. "Ultimately, we aim to integrate this technology into window grilles that can help mitigate urban noise pollution conveniently."

The researchers demonstrate the device in the video below.

Source: [Nanyang Technological University, Singapore](#)

