

Temperatures and wind conditions move traffic noise

May 25 2011, by Deborah Braconnier



(PhysOrg.com) -- Imagine sitting down for your early morning coffee when your nice little suburban morning is disrupted by the sound of highway traffic from a quarter mile away. When you purchased your home far from the freeway, the last thing you expected to hear was the roar of traffic, but according to a new study presented at a meeting of the Acoustical Society of America, Nick Ovenden from University College London says that is exactly what can happen when the right temperatures and wind conditions are present.

Ovenden worked with an Arizona team to investigate reports from some local Scottsdale, Arizona residents that had been hearing loud noises during the early morning and dusk hours. These residents lived a third of a mile away from the closest highway.

By using measurements of sound levels, [wind speeds](#) and direction, and

temperature, the team inputted the information into models of noise, including the prism-like effects that wind and temperature can have on [sound waves](#).

What they discovered was that under the right conditions of crosswind and [temperature gradient](#), sound that would normally go vertical is refracted back down. The reason this occurs most often in the early mornings and at dusk is because sound bends from hotter air to cooler air.

At these locations in Scottsdale, the team was able to record sounds as high as 67 [decibels](#), which, if it lasted an hour or longer, is above what the U.S Federal Highway Administration allows without requiring that noise abatement be created. While Ovenden did not record the noise for over an hour, he does say that under the right conditions, it would be possible.

While any type of meteorological effect is currently not being used with highway noise models, Ovenden believes this information shows that it should be considered when planning a new highway in order to determine just how bad noise could be in certain areas.

More information: Research paper: Impact of meteorological conditions on noise propagation from freeway corridors, J. Acoust. Soc. Am. Volume 126, Issue 1, pp. 25-35 (2009)
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April 2024 from <https://phys.org/news/2011-05-temperatures-conditions-traffic-noise.html>

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