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Living close to an airport means living close to noise. For many airport community residents, that fact alone is enough to diminish the pleasure of home life. Until now, aircraft noise engineers have focused on reducing the noise of airplanes, believing this would be enough to raise satisfaction levels.

However, the European Union (EU)-funded COSMA project has found that acoustic parameters are not the only cause of annoyance among airport communities, and that properly addressing the problem requires more than reducing noise levels.

“Ask someone on a Wednesday afternoon whether they find the noise of a plane annoying and they are likely to say no or not very much. Come Sunday morning and they will probably describe the same sound as quite aggravating,” says COSMA coordinator Dr. Michael Bauer from the European Aeronautic Defence and Space (EADS) company in Germany. Building on research from COSMA’s predecessor, SEFA project (which ran from 2004 to 2007), COSMA team has left behind the idea that loudness alone determines whether a noise bothers a person.

Based on data collected from more than 3,000 people living close either to London Heathrow (UK), Cologne-Bonn Airport (Germany) or Stockholm Arlanda Airport (Sweden), the study found that many non-acoustic factors also play a role. “These factors are tied to human behaviour,” explains Bauer. When people are falling asleep, waking up, or enjoying a quiet moment on the weekend, noise is particularly annoying. But different sound characteristics, such as tonal noise, can also cause different levels of irritation.

To explore this further, COSMA researchers designed a sound machine that combined different noise sources of an aircraft. Approximately 200 volunteers were asked to adjust these sounds to the point where they found them less annoying or not annoying at all.

“The results showed that to really change annoyance, we need to move away from this focus on only...
making planes less noisy,” comments Bauer. Bauer notes that the area of aircraft-related annoyance is still very new. But after almost four years of research he is confident that “COSMA’s findings will impact the industry, also because there is great political will to reduce the annoyance caused by aircraft noise.”

The project team has made recommendations as to how sounds should be composed in future aircraft sound engineering and the team has also designed a so-called virtual resident platform for further research. “Basically, our platform resembles a virtual listener, which imitates a neural network and was fed with all the data collected during COSMA,” explains Bauer.

With this tool, it is possible to make predictions of how annoying a person would find a particular noise and how the sound should be altered to make it more acceptable. In theory, it could be used in parallel to aircraft sound engineering as a sort of testing system. “Of course, we should also continue our efforts to reduce noise levels,” says Bauer. “But if we combine that with COSMA’s findings, we might achieve bigger effects in terms of reducing annoyance even with smaller noise level reductions,” he concludes.

See also:
CORDIS [2]

Project:
Community oriented solutions to minimise aircraft noise annoyance
Project Acronym:
COSMA


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