

Note from WG-AEN on the dose-effect relations for aircraft noise

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1. The Position Paper on dose response relationships between transportation noise and annoyance was published by the EC in 2002. On the basis of a study by Miedema, relations for the annoyance caused by road, rail and air transport were established.
2. In 2004 Guski (University of Bochum, Germany) observed that for the studies reported there could be an indication for an increase in the annoyance for aircraft noise over time. Or as he expressed it: the Lden level to cause 25% highly annoyed decreased.
3. The Miedema study is based on a relatively old dataset: the major part of the database dates from the eighties, the oldest is from 1965 and the newest from 1991. A substantial part of the database is from US/Canada/Australia.
4. Van Kempen (2006) analysed a dataset with studies from 1990-2005, and after eliminating a number of other plausible explanations like a shift in response rates, an increase in number of aircraft and others concluded that a shift over time remained, although the variability remains high.
5. Recently (published sept.2006) around Frankfurt Airport a high quality impact study was carried out. The comparison with other studies shows very clearly that all studies except 1 (Swiss) performed after 1991 cluster significantly above the Position Paper relation. The "Guski-criterium" for 25% highly annoyed sinks from 62 Lden to around 50 Lden. Experience from Amsterdam Airport where identical studies were carried out in 1996, 2003 and 2005 show that in this area the dose-effect relations are stable over time, and almost identical to the Frankfurt-relations.
6. For road and rail traffic there are however no indications for a similar shift.
7. As the EU-dose-effect relations are used to estimate the number of affected people, the reliability of the relations is important.
8. Whatever the causes may be for the –apparent- increase over time, there is enough evidence to decide for an adaptation of the Position paper on this point. At the same time also the relations for Lnight for aircraft noise could be submitted to scrutiny as the same could apply. Results from Frankfurt as well as from Amsterdam do indicate that.
9. What is needed: a small scale desktop study to establish the dose-effect relation for annoyance for aircraft noise for application in the EU. The emphasis therefore should lie on the use of recent, preferably EU, studies. In the same study it could be efficient to tackle some methodological and statistical aspects relating to non-acoustical factors.

