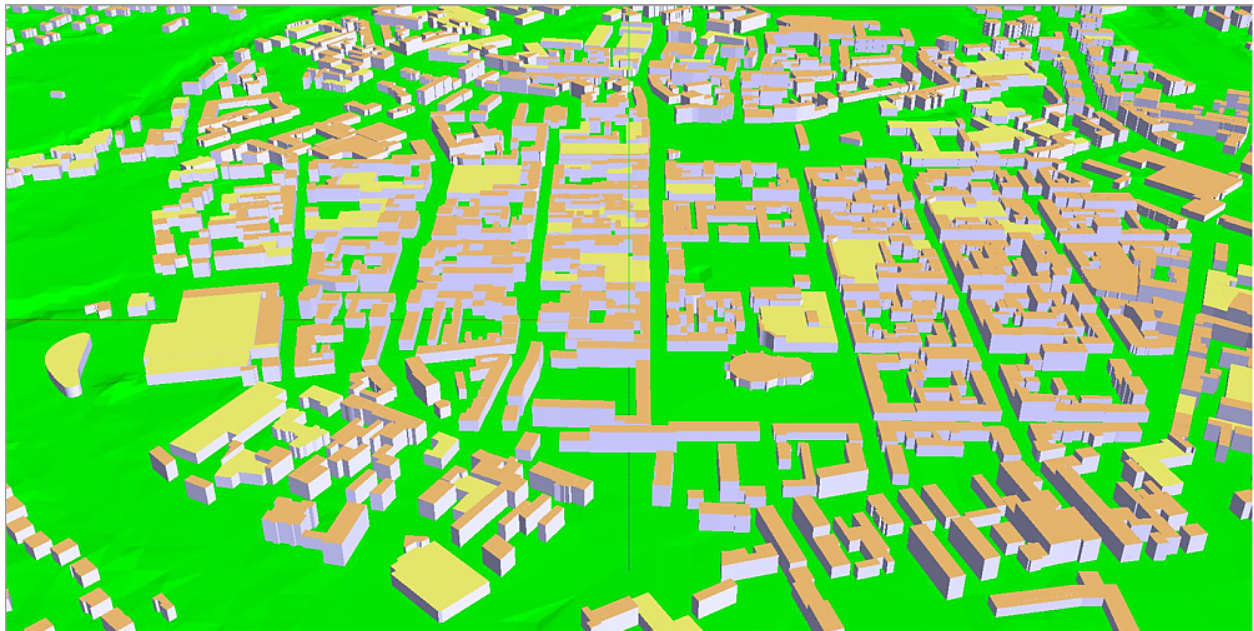


# Acoustic basics



(Source: Möhler + Partner AG)

Determination of the noise exposure is the foundation of a noise effect study. The acousticians of the NORAH Study put a lot of energy into this area. They calculated the exposure to aircraft, road and rail traffic noise in the Frankfurt area for the addresses of about 900,000 buildings, at different day and night times and for up to 18 years into the past. Additionally, they collected noise data of 2,500 residents in the area of each of the airports Cologne/Bonn and Stuttgart and about 5,000 residents at the airport Berlin-Brandenburg, which is under construction.

## Aircraft noise calculation

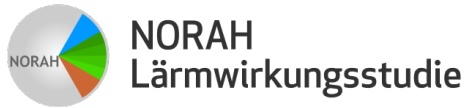
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The aircraft noise data of the NORAH Study have been calculated based on radar recordings of the German flight safety authority. By comparison to noise levels measured on site, the acousticians were able to document that the calculated levels map the actual exposure very well.

## The NORAH acoustic database

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The NORAH acoustic database contains about 30 “acoustic characteristics” for every study participant, among others long-term energy equivalent noise level for day (6 a.m. – 10 p.m.) and night (10 p.m. – 06 a.m.), average maximum levels and maximum level statistics, each separated by aircraft, road and rail traffic noise, for the respective year before the examination and for the



participants of the study on health risks even for the years 1996 to 2014. Of course, all data are anonymised according to the provisions of data privacy.

## Road and rail traffic noise

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The data on road traffic noise are based on traffic counts of the state and the municipalities. Rail traffic noise data come from the Federal railway office and the Bahnumweltzentrum Berlin. Digital terrain models are used by NORAH to also consider obstacles in sound propagation – e.g. when a train line is behind a hill or building rows deflect noise.

## Individual residential situation

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The NORAH acousticians also considered information from the study participants on the floor or position of their bedroom in the deeper survey on the health situation. These factors may considerably influence how much noise actually reaches the study participant's ear.

## Further information

More information on the acoustics of the NORAH study can be found in NORAH Knowledge No. 2. Further information on the results of the NORAH study can be found in NORAH Knowledge No. 14.

- [NORAH Knowledge no. 2 PDF, 2 MB](https://www.laermstudie.de/media/download/norah_knowledge_02.pdf)  
([https://www.laermstudie.de/media/download/norah\\_knowledge\\_02.pdf](https://www.laermstudie.de/media/download/norah_knowledge_02.pdf))
- [NORAH Knowledge no. 14 PDF, 2 MB](https://www.laermstudie.de/media/download/norah_knowledge_14.pdf)  
([https://www.laermstudie.de/media/download/norah\\_knowledge\\_14.pdf](https://www.laermstudie.de/media/download/norah_knowledge_14.pdf))

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## Do you have any questions?

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