

1. Introduction

Noise is one of the main factors of the ecological threats of civilisation. The Council of Experts on Environmental Issues found that, according to preliminary findings, noise is to be considered as a risk factor, which can cause health impairment in combination with other stress factors. Among other things, noise can provoke sleeping disorders, headaches, inappetence, aggression as well as a decline in the physical and mental working capacity.

The Austrian conductor Herbert von Karajan once called noise "the audible garbage of our civilization".

The EU Environmental Noise Directive from 2002 regulates that the member states draw up noise maps for all agglomeration areas and work out action plans. The Environmental Noise Directive was to be translated into national law by July 2004. In Germany, it was implemented on 24 June 2005.

[Figure 1/1](#) gives the noise exposure of the German population in 2000.

The figure shows that about 50 % of the population feels frequently or permanently annoyed by noise. What annoys them most is road and aircraft noise. Noise caused by neighbours and industrial noise also play a major role.

Annoyances due to leisure noise (e.g. from sports and leisure events) have considerably increased in the past years, bringing about an Ordinance on the Prevention of Noise from Sports Facilities (Sportanlagenlärmschutzverordnung) within the Federal Immission Control Act (Bundes-Immissionsschutzgesetz)

People living in city districts near the centre are particularly exposed to traffic noise. More than one person in three keeps the windows closed most of the time or all of the time or does not use their balcony or terrace. Restrictions like these are considered as substantial limitation of the indoor environment quality.

People's exposure to traffic noise was analyzed on the basis of data from traffic noise maps in Stuttgart (VERKEHRSLÄRMKARTIERUNG STUTTGART, 1983) and by using census figures collected by the Statistical Office of the City of Stuttgart (STATISTISCHER INFORMATIONSDIENST, 1990). The data of block sides was assigned to the recorded noise levels at the side of the roads (without distance corrections).

The results illustrated in [figure 1/2](#) show that 5.8 % of Stuttgart's 590,774 inhabitants (state of July 2005) lives by the side of roads with a noise level of 75 dB(A) and above. 13.2 % of Stuttgart's inhabitants lives along roads with a noise level of 70 to 75 dB(A). These figures show that about 19 % of the people lives by the side of roads with an extraordinarily high noise level.

Another 22.6 % of the inhabitants lives along roads with a noise level of 65 to 70 dB(A). This means that about 42 % lives in an environment that meets the requirements of TA Lärm (Technical Instructions on Noise) for areas used for industrial and commercial purposes.

The degree to which people are exposed to noise differs according to the population groups, as shown in [figure 1/2](#). The investigation revealed that foreigners and workers are the most exposed to noise.

Noise exposure brings about various costs, which can hardly be estimated. Especially the following cost factors need to be considered:

- reduction of the housing value
- noise protection measures
- productivity losses
- adverse health effects
- annoyances

Well-founded cost estimations on the reduction of the housing value through road traffic noise are available (UPI, 1991, a; Environment and Prognosis Institute): The reduction of the housing value through road traffic noise was indicated with about 21.73 billion euros (about 42.5 billion DM) for the

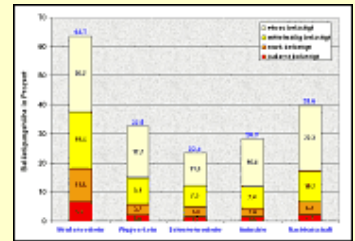


Fig. 1/1: Noise exposure of the German population, separated into noise source groups, Source: Federal Environment Agency (2002)

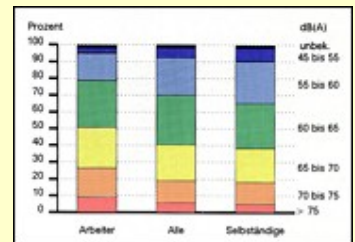


Fig. 1/2: Percentage of Stuttgart's inhabitants affected by traffic noise

year 1989, plus about 1.02 billion euros (2 billion DM) for medicaments and removals. Other sources of noise have caused the following costs (UPI, 1991, b):

Aircraft noise	18.1 billion euros/year (35.4 billion DM)
Railway noise	4.4 billion euros/year (8.6 billion DM)
Industrial noise	4.24 billion euros/year (8.3 billion DM)
Sports ground noise	2.51 billion euros/year (4.9 billion DM)

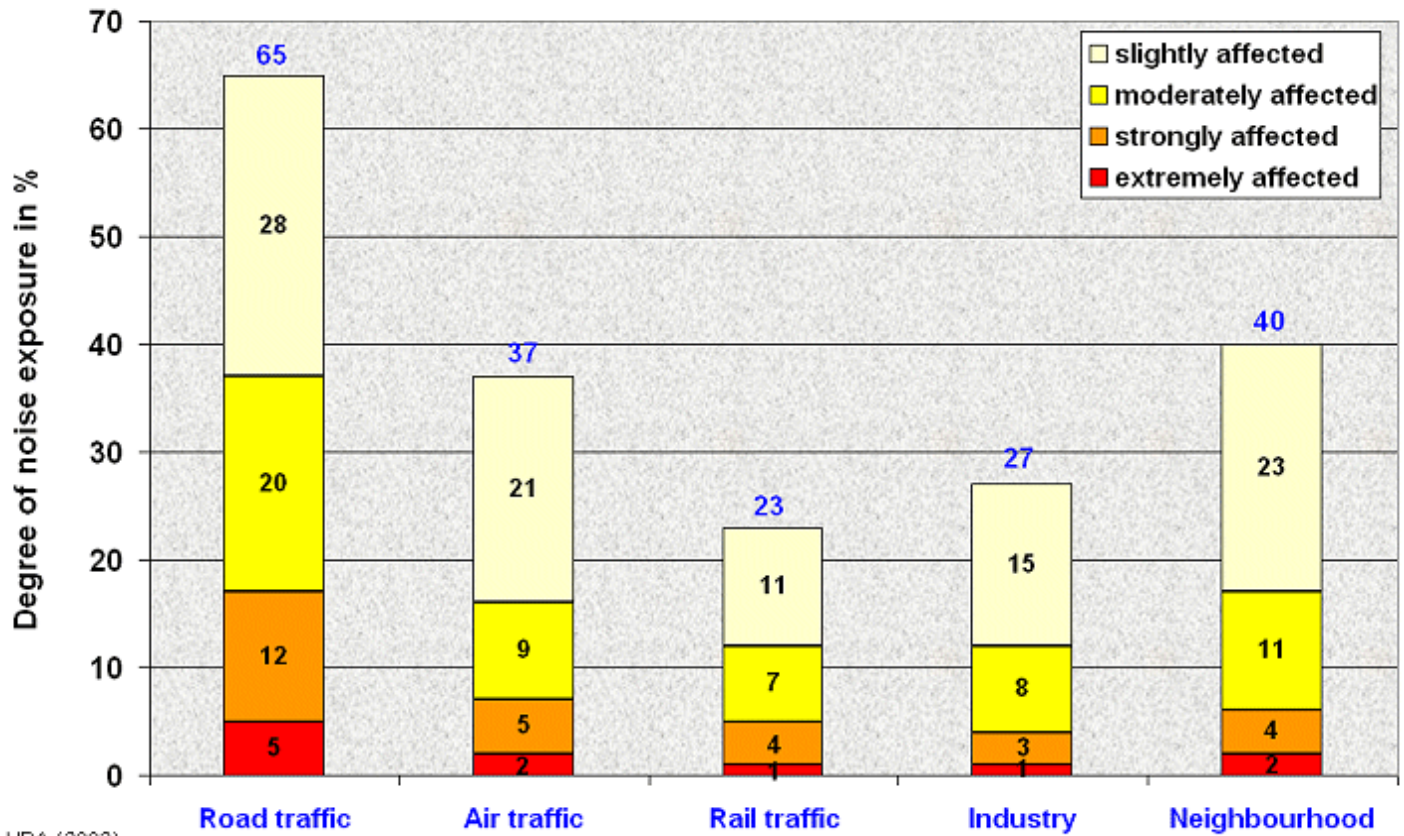
These huge economic costs of about 51 billion euros per year (about 100 billion DM) clarify the importance of noise prevention and noise abatement aspects already in the planning phase.

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Noise exposure of the German population, separated into noise source groups



Source: UBA (2002)

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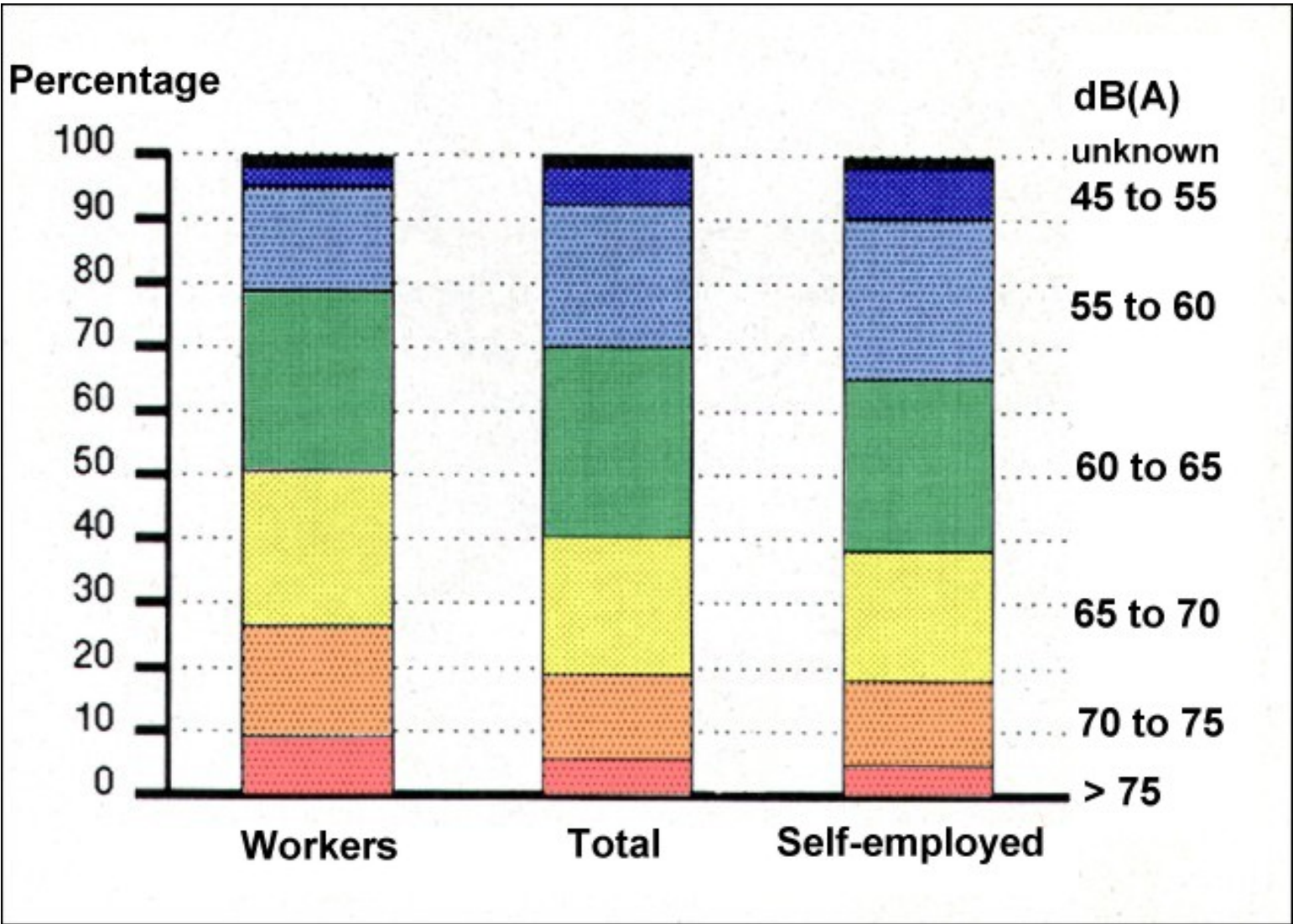


Fig. 1/2: Percentage of Stuttgart's inhabitants affected by traffic noise