# REGULATION ON LIMIT VALUES FOR NOISE FROM TRAFFIC AND INDUSTRY

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**Introduction** In 1997 a new regulation came into force in Norway, which sets limit values for acceptable level of indoor noise due to traffic (road, rail and aircraft) and industry. The regulation concerns dwellings, hospitals, schools and kindergartens. The owner of the noise source is responsible for mitigation measures when the limit value is exceeded.
This paper presents how the Norwegian Public Roads Administration (NPRA) deals with the new regulation, and what we think the advantages and the disadvantages of the regulation are. A disadvantage of the regulation is that it focuses on indoor noise level, and not on the noise source (the traffic). To improve facades does not lower the noise emission.

**Background** Norwegian Public Roads Administration is responsible for about 70 % of the noise annoyance in Norway. A total of 1.4 million people live in areas where the WHO recommended limit of 55 dBA is exceeded, and many of these people have unacceptable high indoor noise levels. To do something about the worst cases, the government in 1997 put a new regulation into force in Norway: Regulation on limit values for local air pollution and noise. The regulation calls for mapping on air pollution and noise and clarification of actions. Furthermore the regulation calls for measures that will reduce the degree of pollution for those who are mostly affected. It regulates noise from traffic (road, rail and aircraft) and industry. NPRA has for many years had a subsidy system where people annoyed by traffic noise can apply for fully or partly financial assistance. NPRA subsided both indoor and outdoor mitigation measures like changing windows or putting up a noise deflection wall. Subsidy were given according to NPRAs own guidelines and limit values.

**The limits in the regulation**

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| Actions: | Indoor level $\geq L_{ekv,24h}$ | **42 dBA** or higher |
| Mapping on noise: | Indoor level $\geq L_{ekv,24h}$ | **35 dBA** |

The limits include existing buildings. For new buildings the stricter limits in the building act comes into force.
The deadline for noise measures are 2005, by then no one should be exposed for indoor noise level above 42 dBA.

**Consequences for Norwegian Public Roads Administration** Norwegian Public Roads Administration is responsible for limit exceed in about 3500 houses, schools and kindergartens. These buildings will get mitigation measures. More than 65 000 dwellings (120 000 people) exceed the value of 35 dBA.
In 2003 the cost of noise mitigation measures will be 39 mill EURO, which is 2,1 % of our total budget in the Roads Administration. The aggregated cost from 1999 to 2005 is estimated to be 85 mill. EURO. This does not include salaries in our own department.
Most of the noise measures are improvements on the facades, including change of windows. The affected buildings are usually too close to the road to put up a noise-deflection wall. This

is a challenge in regards to esthetics, antiquarian considerations, ventilation and indoor air quality.

**Discussion** The regulation on noise limits secures noise mapping of the most exposed areas, and actions when the indoor noise level exceeds $L_{eq,24h}$ of 42 dBA. The regulation undoubtedly makes the indoor noise situation very much better for the people most annoyed by noise. A disadvantage of the regulation is that the focus is on indoor noise level, and not on the noise source. To improve facades does not lower the noise emission.
NPRAs existing subsidy system has been stopped, due to the high costs to fulfil the regulation on noise limits. The system subsided both facade-measures and outdoor noise measures. The advantage of this system is that those who *feel highly annoyed* could have their expenses for noise measures partly covered, even when their noise level was not the worst. Since noise is a subjective experience this kind of subsidy systems is also very valuable.
In Norway we also have a national target on noise, which were confirmed by the Norwegian Parliament in 2000. The national target regards noise annoyance, and it includes both highly annoyed, annoyed and less annoyed people given as the *mean annoyance score*. The total noise annoyance in Norway is to be reduced by 25 % in 2010 compared with 1999.
By using the mean annoyance score we get the focus on the noise source, because reduction of the noise source favours both those highly annoyed and those less annoyed. Measures on the facades though, gets very little credit when you look at larger areas, because they only affect single buildings. Facade measures are not cost effective when the mean annoyance score is concerned.
There are great advantages of all the noise reducing systems mentioned above, and together they fulfil each other. Unfortunately noise is such a big challenge, and still not prioritized enough to support both focus on the individual highly annoyed by noise and on the noise source. The regulation on noise limits has lead to dispose of the highest indoor levels, but also to less attention to the noise source. The general noise annoyance from road traffic is still increasing.

**Keywords:** Regulation on noise, indoor noise, noise measures, annoyance score