



Calculating Noise Charges in Railway Infrastructures

Swedish researchers have recently explored how to determine railway-noise charges in the European Union to promote the reduction of noise levels based on the marginal cost principle. The authors conclude that it is possible to apply already existing knowledge of monetary and acoustical noise evaluation to estimate infrastructure charges.

Environmental externalities refer to the economic concept of uncompensated environmental effects of production and consumption that affect consumer utility and enterprise cost outside the market mechanism. In Europe, policy analysts are being required to take environmental aspects into account in their decision making and to undertake cost-benefit analyses of available options. Transport is beneficial to society but it is also a source of considerable environmental impacts, mostly representing externalities, e.g. air pollution, noise, destruction of wild life areas, etc. In particular, noise levels have increased considerably as a result of an important increase in traffic volume. In order to reduce noise associated with transport, policy makers can choose between reducing either the emission or the exposure. Previous studies have shown that the costs of reducing emissions at source are lower than the costs of reducing exposure through barriers, façade insulation, etc. In this regard, incentives are one of the options used to reduce emissions at the source, either by subsidies where operators, for example, are given subsidies to install technical measures to reduce noise, or imposing charges based on short-run marginal costs (SRMC). In order to achieve a competitive transport sector and to mitigate the negative effects from traffic, it has been decided that the infrastructures charges should be based on SRMC.

Swedish researchers have explored how railway-noise charges based on the marginal cost principle can be estimated. To this end, they estimated railway-noise charges in a case study and then outlined an estimation model. They then discussed the kind of information that would be necessary to estimate railway-noise charges.

The main results of the study are as follows:

- The effect of changes in total traffic (within reasonable limits) for a certain railway line on the SRMC is negligible.
- The estimated SRMC is sensitive to the number of individuals exposed.
- Standardised methods for the calculation of total noise level can be used to get diversified charges.

Therefore, according to the authors, while there is no need to update the marginal cost calculations based on changes (within reasonable limits) in traffic volume when determining the railway-noise charges, it is important that the estimated number of individuals exposed reflects actual figures.

The authors highlight that it is important that charges are context-dependant and that the estimation of the marginal effect that is used is not too simple in its construction. A charge which is the same for all train types would probably be inefficient as it would destroy the incentive for operators to utilize technology that reduces noise emissions. For example, changing the brake blocks on freight wagons from iron to commercially available composite blocks, typically lowers the equivalent noise levels by 8dB. Lowering the noise levels in a freight train in the analysed case by 8dB, lowers the marginal cost from € 0.89/km to €0.14km, which is a strong incentive for operators.

Overall, the authors show in this paper that using the number of individuals exposed, it is possible to calculate the SRMC for railway-noise by using already existing standardised calculation methods for determining the noise levels and estimates of monetary values already in use by national authorities in some countries of Europe. Nevertheless, it is important to take into consideration that monetary noise values based on rail-traffic are often missing both at national and European level.

Source: Henrik Andersson and Mikael Ögren (2007) "Noise charges in railway infrastructure: A pricing schedule based on the marginal cost principle", *Transport Policy* 14:204-2130.

Contact: henrik.andersson@vti.se

Theme(s): Noise, sustainable mobility

Opinions expressed in this News Alert do not necessarily reflect those of the European Commission

To cite this article/service: "[Science for Environment Policy](#)": European Commission DG Environment News Alert Service, edited by BIO Intelligence Service.