

(EC/EMISIA) STUDY ON SOUND LEVEL LIMITS OF M- AND N-CATEGORY VEHICLES

SOUND LIMITS
TYRE ROLLING SOUND
VEHICLE SOUND
ROAD SURFACE/TYRE SOUND

Database assessment
Testprogramm
Lit. Study
CBA

MAIN MESSAGES FROM THE PRESENTATION(S)

Study linked to the project entitled “Study on sound level limits of M- and N-category vehicles” mandated by the European Commission, which aims at reviewing and possibly updating the sound level limits for all M- and N category vehicles, taking into account the evolution of sound levels of approved vehicle types, the citizens’ needs, and the technical and economic feasibility.
Based on literature review, data, Cost Benefit Analysis with different scenarios, proposal for tightening limits on sound for certain types of vehicles and tyres, and ASEP (Addition Sound Emission Provisions) impact evaluation.

SUMMARY

The study makes an inventory of the needs of society on sound. This is based on a questionnaire for the social partners. Also, earlier research of WHO (World Health Organization)[1] and the PHENOMENA[2] report is referred to. Industry stakeholders are interviewed in order to identify areas for improvement.

The further steps of the study include

- Testing of vehicles and noise source ranking analysis,
- Cost benefit analysis,
- Proposals for phase 4 limit values only for some subcategories, and
- Proposals for amendments of the measurement method and ASEP requirements

The noise source ranking analysis showed that L_{urban} is dominated by tyre/road noise for M1 vehicles.

The cost benefit analysis included the following 6 scenarios:

- A. Available limit space,
- B. Targeted limit tightening,
- C. 75 dB(A) cap,
- D. L_{wot} restrictions,
- E. Improved pass-by tests (incl ASEP),
- F. Quieter tyres (-3 dB(A))

And 6 combinations of these

The most important result is that a further reduction of tyre limits (scenario F) is much more beneficial than further reductions of vehicle noise limits. The percentage health burden reduction in 2045 is calculated about 5 times higher for scenario F compared to the average of scenarios A to D. But scenario F is out of the scope of this study and thus was not considered for the proposal for phase 4 sound level limits.

Scenario E (improvements of the ASEP requirements) is a bit more effective than scenarios A to D, but its implementation would also require an extension of the scope of the study and more effort than limit value reductions according to scenarios A to D. Therefore, this scenario was also not considered.

Due to the low differences between the simulated scenarios A to D the potential for limit changes was based on the KBA and RDW database analyses (type approval and vehicle stock data from databases available at that time of this study), which are in line with the CBA scenarios A and B.

The proposals for phase 4 sound level limits were made vehicle subcategory specific as follows:

- No further phase 4 reduction (most important M1 subcategories, all M2 subcats, N1 with $TPMLM > 2500$ kg, N2 with $P_{rated} > 135$ kW and N3 with P_{rated} between 150 and 250 kW,
- 1 dB(A) reduction for very high powered M1, all M3 subcats, N1 with $TPMLM \leq 2500$ kg, N2 with $P_{rated} \leq 135$ kW and N3 with $P_{rated} \leq 150$ kW,
- 2 dB(A) reduction for N3 with $P_{rated} > 250$ kW.

Category(ies) of vehicle : M & N

According to the measurement method for M1, M2 with TPMLM ≤ 3500 kg and N1, it is recommended to scrutinize the validity of the calculation method for L_{urban} since the database (in-use driving behaviour data) was collected between 1995 and 2005 and since the PMR (Power to Mass Ratio) of the vehicles under discussion have been increased significantly and this trend is not yet broken. The average values for M1 vehicles increased from 62 W/kg to 70 W/kg between 2005 and 2020.

An analysis regarding the contribution of different noise sources to the overall vehicle noise showed that, in particular with the advancing electrification of the vehicle fleet, the tyre/road noise will become the dominant noise source (certainly for M1 vehicles above 30km/h and likely for other vehicles, albeit at higher speeds).

ADDITIONAL POINTS FROM DISCUSSIONS IN THE UN TF-VS

In the GRBP TF-VS focusses on the scenarios of the CBA, there was controversy on the proposed timeframe and expected impact for the introduction of the measures related to tyres and road surfaces. The assumptions used in the report indicate that quieter tyres are already on the market and this technology can be introduced more widely. This is technically not feasible in the proposed timeframe according to the tyre industry. More detail in the ATEEL reports (TFVS-07-04 & TFVS-11-05).

REFERENCES

The research was conducted by a consortium consisting of

- Laboratory of Applied Thermodynamics (LAT) (overall framework contract coordinator)
- EMISIA (technical coordinator and project manager)
- Forschungsgesellschaft für Energietechnik und Verbrennungsmotoren (FEV)
- Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek (TNO)
- Heinz Steven Data Analysis and Consultancy (HSDAC).

on the request of EC DG GROW (Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs of the European Commission).

- [GRBP-73-23](#) (EC): Study on sound level limits of M- and N-category vehicles – intermediate report,
- [TFSL-02-08](#) (EC): M- and N- sound limit study – intermediate report,
- [EC Study for M/N-cat.](#) or [TFVS-07-11](#) (EC/EMISIA): Study on sound level limits of M- and N-category vehicles – full report,
<https://op.europa.eu/en/publication-detail/-/publication/d23a63bc-8310-11ec-8c40-01aa75ed71a1/language-en>
- [TFVS-09-03 Rev.1](#) (EC-HSDAC): presentation of the EC study for M_N vehicles

[1] [Environmental noise guidelines for the European Region: WHO Regional Office for Europe. ISBN: 9789289053563](#)

[2] [TFSL-03-04](#) (TNO) & [TFSL-05-03](#) (EC DG/ENV.): Phenomena project → Official report: [Assessment of potential health benefits of noise abatement measures in the EU - Publications Office of the EU \(europa.eu\)](#)

[3] [TFVS-07-03](#) & [TFVS-07-04](#) (OICA/ATEEL): report & presentation of the OICA/ATEEL study, and [TFVS-10-04 Rev.1](#) & [TFVS-11-05](#) (OICA/ATEEL): Comparison between EC/EMISIA & OICA/ATEEL studies