ECONOMIC COMMISSION FOR EUROPE
INLAND TRANSPORT COMMITTEE
World Forum for Harmonization of Vehicle Regulations (WP.29)
Working Party on Noise and Tyres (GRBP)
Task Force on Vehicles'Sound (TF-VS)

Draft Report of the 11th Session of the Task Force on Vehicles Sound TF-VS On Friday 09th September from 09:30 to 16:00 (CET)

Hybrid (Meeting room XXII at the Palais des Nations, Geneva)

		Working Documents (*) not available before the meeting
1.	**Welcome and opening remarks**	
Mr.Ficheux welcomed the participants to this 11th Session.		
2.	**Introduction of participants and organizations**	TFVS-11-02 (*)
Attendees this 11th session of the TF-VS agreed for sharing with the group: ▪ the attendance list as proposed under document TFSL-11-02 which will be shared by email only with the attendees with protection through a password, ▪ any documents used and/or presented during this Session and also to make them public on the UNECE website. 27 attendees in person are mentioned in the attendance list.		
3.	**Adoption of the agenda** **Adoption of Report of 08th session**	TFVS-11-01 Rev.1 TFSL-10-08 (*)
Draft agenda as Document TFVS-11-01 Rev.1 is adopted. Draft report of the 10th session is not yet available. Apologies from the Secretary. Adoption of the 10th Session minutes is reported to the next Session.		
4.	**Exchange of information on national and international requirements** 1. (EC) studies on vehicles' sound emissions for a) M, N vehicles' noise (HS Data Analysis and Consultancy-TNO-Aristotle University of Thessaloniki) Link to the official report: Study on sound level limits of M- and N-category vehicles - Publications Office of the EU (europa.eu) b) L vehicles (Idiada) Link to the official report: Technical support for the impact assessment on Euro 5 step of L-category sound emissions level limits published on June 03, 2022 c) (OICA/ACEA) Intermediate presentation regarding the analysis of the EC study for M/N-categories of vehicles • Final presentation d) (JAPAN) Comments on EC study related to M/N categories: ▪ Questions & confirmation	TFSL-02-08 TFVS-06-03 TFVS-07-11 TFVS-09-03 TFVS-04-15 TFVS-09-04 TFVS-10-03 TFVS-11-08 (*) TFVS-11-10 (*) TFVS-10-04 TFVS-11-05 / GRBP-76-14 TFVS-10-06 TFVS-10-07

	▪ N2 category of vehicles threshold 135 or 150 kW e) (EC) Comments, confirmation & answers following the discussions at the 10th Session 2. (IWG-MU) IWGMU-20-04 STEER – CEDR (Conference of European Directors of Roads): Noise & Nuisance call - Final conference June 2022 PEB: Research Programme 2018 Noise and nuisance (cedr.eu) STEER (cedr.eu) 3. Any other national information? a) New ACEA Position paper on Noise emissions b) China → GRBP-76-29 c) ETRTO → comments on EC/EMISIA study	TFVS-11-03 TFVS-11-04 / GRBP-76-25 GRBP-76-29 TFVS-11-06

1.c) (OICA/ACEA/ATEEL) Comparison of EMISIA & ATEEL study on sound limit valued for vehicle category M & N – Review study – Final presentation – TFVS-11-05 / GRBP-76-14

As reminder, an intermediate report was done at the 10th Session of the TF-VS based on document TFVS-10-04 Rev.1.

- *Comparison of study approaches and findings ATEEL – EMISIA study*
- *Impact calculations for limit value scenarios and alternative measures using ATEEL simulation tool*
- *Representativeness of type approval values for real traffic situations differing from type approval conditions*
- *Conclusions after peer review and recommendations*
  - *Conclusion regarding benefits and measures*
    - *Both studies conclude that benefits by further limit reductions are highly limited and time delayed*
    - *Benefits of the CBA appear significantly too high according to recalculation with ATEEL tool*
    - *Both studies conclude that a reduction of tyre rolling sound provides the highest benefit*
    - *Powertrain measures only contribute to sound improvements in conjunction with quite road surfaces and / or tyres*
    - *Improvements by alternative measure such as quiet asphalt or vehicle speed limits evaluated by ATEEL as most efficient*
  - *Conclusion regarding results and final limit value proposals*
    - *EMISIA study final proposal provides only minor space for limit reductions –> only a minor improvement can be expected*
    - *The final proposal for category N3 is not considered realistic (see presentations GRB-51-13, GRB-51-20, GRB-53-17)*
    - *Considering higher accelerations is a step back towards UN R51.02 – inefficient and not representative for real traffic*
    - *Most single events, caused by bad driving style or manipulated vehicles, could be handled efficient by traffic monitoring*
  - *Recommendations for next Steps*
    - *Legislation side – limit value adaptations beyond phase 3*
      - *Waiting for new exhaust emission legislation impact on vehicle design*
      - *Wait for phase 3 vehicles to enter the market and observe the impact on sound level*
      - *Examine more closely costs and risks/drawbacks of other disciplines such as safety and pollutants*

        - *Take also into account the desired/efficient movement of goods and people. e.g. payload or packaging issues*
    - *Additional tasks that could help to get a better understanding on real traffic issues*
        - *More campaigns similar to recent studies (Fauville, Bruitparif, G+P Switzerland and FEDRO) help to understand real traffic noise*
        - *Gathering of N3 vehicle data with realistic configuration especially on street types with higher driving speed*

<u>Some of the main points discussed from this presentation</u>:

- Potential discrepancy between the OE tyre used during the type-approval process (probably the quietest with the safest tyre performances) and the real tyres fitted to the vehicle which may have been replaced by the vehicle's owner with different performances due to the vehicles owner's priorities which could be e.g. the fuel consumption, lifetime or price or other reasons rather than the rolling sound. The status of tyres in real life is unknown.
  This is the main reason why in the Emisia study, no further reduction was proposed for 'normal' M1.
- Tyre noise does not mean anything by itself but the interaction between the tire and the road including the road dispersion has to be considered.
- ETRTO presentation regarding the "Cost-Benefit Analysis" done by EMISIA → see item 3.c) below.
- In both studies (ATEEL & EMISIA), aging of vehicles was not considered but the renewal of the fleet was considered with a certain exchange rate of the vehicles.
- Regarding the link between the modelling and the testing, and the modelling of real scenarios in noise mapping: in the presentation, it was shown that the forecast of the models on noise mapping would show a higher result than it would be in reality
  - ➔ Would it be easy to transfer this know-how to the existing methodologies to calculate the noise levels into noise mapping, so that they match to the real performance of existing and future vehicles, and obviously also considering the road surface that should already be there?
  - ➔ In the model pretty complex as proposed by ATEEL, focus was on the type-approval values & procedure and they tried to transfer that in real life scenarios. It is possible to adapt it to consider other things like street types, weather scenarios, tire choice, age of the vehicle … That means it can be opened to all kind of concerns that may be raised by the calculations. Then they will try to make this model as accurate and as clean as possible. They can recalculate from whatever we ask and see what the impact would be.
  - ➔ In current EU model, software is used to collect the status of the road surfaces, the speed, the acceleration, the location of the vehicles, the number of M1/N1/N2 vehicles on the street. Then they are put into the EU model and software run a calculation but a part of the propagation of the noise is left.
  - ➔ It would be good to be able to transfer the knowledge of the ATEEL & the EMISIA studies into the European formula especially
    - to create the link between the knowledge on the testing and the knowledge on the modelling of noise mapping
    - to add some elements like accelerating vehicles which are currently missing in the noise mapping model

    to reach more realistic results.
  - ➔ In current model as proposed by ATEEL, they look real registration data & see the share rate of the vehicles in different PMR classes or whatever is in reality on the streets available or registered at least to be able to consider the type of vehicle as M1 or N1 as well as electric vehicle or sport cars. They used really registered vehicles or the values from the type-approval to extract realistic models for any categories of vehicle to be as accurate and as representative as possible. Already in Europe, the share rate can be really different from one country to another one. Any proposals to improve the model and make it still more representative of real life is welcome.

From EMISIA study, the model as proposed seems to be quite well for instance for M1 and not too far away from a realistic model.

- ➔ From ATEEL, current Cnossos model seems to calculate higher level than in reality.
- ➔ Current ATEEL model is for the time being about what the vehicle will emit which can maybe be transferred in real life including for instance different street types, different vehicles speeds, number of lanes in the street, distance between façade and street will make the model complex. Nevertheless, the combination of the 2 models would be a good approach to get a better understanding.
- ➔ In EMISIA Study, statement was made that Cnossos delivers too low values compared to reality.
  This discrepancy between ATEEL & EMISIA studies needs to be further discussed and solved. Deep discussions needed accordingly.
- ➔ Mr.Boersma from the NL shared another study done by a Dutch institute: based on the RIVM report (see the link below) page 25 (blue bars for GPM, noise emissions measured & orange bars for GPR, Noise emissions calculated), investigations are more or less in line with the Cnossos model. The measured values are very often higher and, in the report, it is concluded that this is related to the age or the state of the asphalt.
  https://www.rivm.nl/bibliotheek/rapporten/2021-0198.pdf page 25 for the measured and calculated results on Dutch roads by RIVM. (In Dutch)
- ➔ From measurement done by Bruitparif, traffic noise is slightly overestimated (~1dB) from the simulation from Cnossos model.
- ➔ For reminder, the Current Cnossos is based on sound emission source data collected in 2007-2009 and the resulting sound emission model was adopted in 2012. The continuous progress of the vehicles and most of the other measures for the noise abatement like speed reduction, better roads are not yet well reflected in the calculation model Cnossos. This progress will be visible not only in the real sound environment but also in the resulting strategic noise maps. OICA will be happy to really deep dive in those aspects and contribute from 2022 in the revision of the Cnossos model which could be published around 2027.
- ➔ A review of each study (Emisia, Phenomena, …) needed to make a kind of a plausibility check on the hypothesis and the scenarios used in the studies to clearly law down what as is assumed in the establishment of such scenarios. These checks should be shared in reports so that readers can validate the scenarios and make them more comparable. 'The level of confidence' in what was assumed then this should be mentioned somewhere.
- ➔ For all studies, there are several steps in the progress of the work. It is important to mention what is really realistic or not.

***Conclusions**: please feel free for sharing any additional questions (in advance if possible) or comments, then it will be possible to come back to this topic during the next Session of this TF-VS (~March-April 2023 to be fixed).*

1.b) (EC) studies on vehicles' sound emissions for L vehicles (Idiada)

In addition, please note the answer from IDIADA related to the question from the NL on the presentation TFVS-10-03 done at the 10th session:

- Question: What exactly mean "high performance with PMR>50"?
- Answer received by email from Mr.Garcia to the secretary of the TF-VS: ""*High performance" term clarification for L3e-A3 (PMR > 50) on UN R41.04:*
  Based on the results obtained in Task 2 and 3, following the UN R41.04 testing procedure, and for the purpose of this study, a L3e-A3 "high performance motorcycle" is considered when the PMR is higher than 392 with an $a_{wot,ref} > 4{,}48\ m/s^2$."

Link to the official report: Technical support for the impact assessment on Euro 5 step of L-category sound emissions level limits published on June 03, 2022

The official publication of the EC/IDIADA report has been identified after the meeting. No discussions during this 11th Session.

***Conclusions**: To be resumed at the next Session of the TF-VS if useful.*

1.e) (EC/EMISIA) Comments, confirmation & answers following the discussions at the 10th Session – TFVS-11-03 ***Presentation by Mr.Steven*** on behalf of the EC consortium

→ *for details, see document TFVS-11-03.*

***Conclusions**: Japanese representatives thanked Mr.Steven for having answered clearly to the questions they submitted at the previous 10th Session.*

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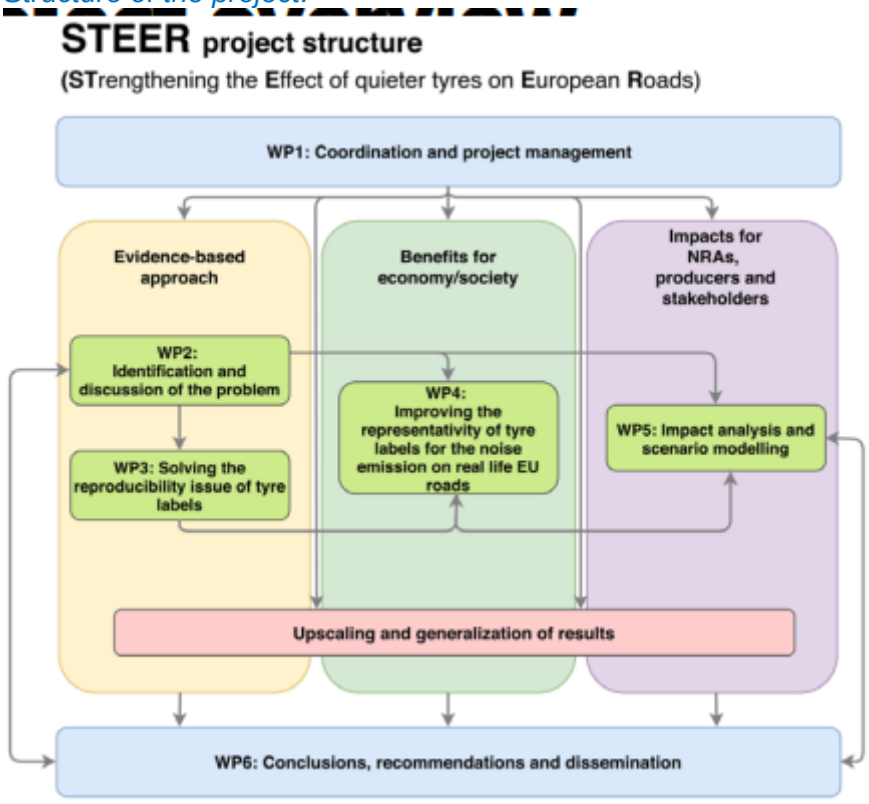
2. (IWG-MU) IWGMU-20-04 STEER – CEDR (Conference of European Directors of Roads): Noise & Nuisance call - Final conference June 2022 - TFVS-11-04 / GRBP-76-25

PEB: Research Programme 2018 Noise and nuisance (cedr.eu) → STEER (cedr.eu)

From document TFVS-11-04 which was also presented at GRBP-76 as Informal document GRBP-76-25, presentation by Mr.Berge to give an overview of the STEER Project:

1. *Project overview*
   - *Correlation between labelled values and real emission values of tyres*
   - *How to improve the tyre labelling system*
   - *Analysis of the impediments for tyre manufacturers to produce quieter tyres*
   - *Effectiveness of different strategies/scenarios for the proliferation of quieter tyres*
   - *Interpretation of existing business case analyses*
   - *Analysis of the short-term benefits of noise reduction 2030*

Structure of the project:



2. *Introduction including*
3. *Review of current tyre label including uncertainties*
4. *Reproducibility vs. uncertainties & potential solutions*
5. *Representativity vs. road surface & potential solutions*

6. *Increasing the market share of quieter tyres*
7. *Impediments for tyre manufacturers*
8. *Conclusions & recommendations regarding the EU tyre label, the impact of quieter tyres on EU roads & their penetration on the market in the future, the awareness and information of consumers*

Some of the main topics highlighted during the discussions:

- In this presentation, the findings have been presented as proposals. Discussions should continue in the IWG-MU because there are some contradicting views on them especially to the vehicle influence.
- Based on slide 32, recommendation for considering the correction based on the air temperature and the road temperature, nevertheless should the tyre temperature also to be considered? → for the test the tires need to be warm up to stabilize the temperature of the tyres themselves. Road surface temperature can be influenced by weather situation during the tests. Variation of the air temperature during the tests was very low and almost stable at 20°C, but the road surface temperature varied much more with impact up to 0,5 dB or even more according to UN-R117. In addition, the difference between the air temperature and the road temperature can be very high. Parameters of the tires themselves as the groove, the belt, … have also impact on temperature inertia and that can be different according to the class of the tyre. Tyre temperature is one of the biggest topics which should be covered in the next years as shown in this study and also through previous OICA investigations.

***Conclusion**: Discussions to be continued mainly in the IWG-MU.*

3. Any other national information?

a. New ACEA Position paper on Noise emissions

Mr.Tyagi from ACEA introduced the ACEA position paper released in July 2022 related to the plans of the EC and the study outcomes.
As very quick reminder of this EC plan: EU action plan towards 0 pollution for air, water & soil with various key targets for 2030 especially to reduce number of people chronically exposed to transport noise by 30%.
Main conclusions of the ATEEL study on the future sound limit values (literature study, collection of data, surveys and their analysis, new model for assessing the impact of noise from vehicles to real life with scenarios accordingly) and other alternatives & complementary measures to contribute to this target.
Several of the points mentioned in this position paper have already been presented & discussed at previous GRBP & TF-VS Sessions.
The last OICA/ACEA position paper available at the following address: Position paper - Vehicle noise: Setting the appropriate limits - ACEA - European Automobile Manufacturers' Association

***Conclusion**: if any questions/comments, please feel free for contacting Mr.Tyagi.*

b. China → GRBP-76-29

Presentation on “Research on Measurement Methods for LDV & HDV in multiple driving mode conditions” by Mr.Xie from CATARC due to the specific road conditions in China vs. current UN and ISO test methods

- *Review of the works in progress in China since 2018*
- *Remaining questions related to test speeds & accelerations in acceleration and cruising modes for LDV still under analysis*
- *Work started for HDV: Survey on 76 HDV vehicles with an ‘~equal’ distribution between the different types of vehicles (bus, coach, heavy truck, light truck, dumper, tractor) with high difference results*

- *Conclusions:*
  - ➔ *For LDV*
    a. *Consider low- speed conditions for LDV (mixed with active sound, muffler and leisure noise problem, below 30km/h).*
    b. *More accurate acceleration range is needed.*
    c. *Emission Model and Evaluation Model for LDV are expected to be established (powertrain including engine and transmission system).*
  - ➔ *For HDV*
    a. *Testing speed 25-45 km/h and engine speed range (85-89% S) in UN R51-03 reflect the real-world working conditions well.*
    b. *30±5km/h, 50±5km/h, 80±5km/h could be the appropriated test speeds for HDV, but depends on the utilities and sub-categories of HDV.*
    c. *Other conditions like the test mass need to study, and the work of HDV measurement methods will be finished next year.*

Some of the main topics highlighted during the discussions:

- For HDV, is was noted that the UN test conditions well suited for type-approval in capturing well the powertrain sound emissions and obviously the speed range representative of the urban conditions. Higher testing speeds would rather target the tire noise.
- Through slides 8 & 9, we can see it is common to use the same kind of powertrain for different kinds of HDV. However, these results could show some differences between Chinese and European situations. Other parameters as the power or the mass of the vehicles with impact on acceleration have also to be considered.
- Statistical approach has been used for distance and driving time, and also for accelerations to make the link between the acceleration and the vehicle speed. However, only a mathematical approach cannot be used. In addition, comparisons & checks are needed to identify the extreme conditions to be able to define conditions closer of real conditions.

***Conclusion**: This research work will continue in China – they expect to finalize it be the end of 2023 - appreciate to work with OICA for focusing on the most representative conditions helpful to solve environmental problems – an updated presentation expected at a next session of our TF-VS.*

c. ETRTO → comments on EC/EMISIA study – TFVS-11-06

Presentation by Mr.Steffan from ETRTO.

- *According to the EMISIA CBA study, the highest benefit achievable through the different proposed scenarios is for quieter tyres with -3dB.*
  ETRTO want to highlight 2 crucial points:
  1. *The justification for the assumption of a possible 3 dB limit reduction*
     → EPREL database was not available when the study was done: from this new database, percentage of A-label tyres for M1 is around 8% instead of 10-20% as estimated at that time in the Emisia study
     → According to the Swiss study "The noise reduction potential of "silent tyres" on common road surfaces" in 2018 based on one tire extremely quiet but with Rolling resistance E & Wet grip C: discrepancy between different studies with a much lower tyre potential compared to the Emisia study. Conflict between tyres performances is confirmed as in ETRTO & OICA Tyre Performance Studies.
  2. *Implementation over the time in the simulated scenario for quieter tyres*
     → in 2 years, tyre industry has to redevelop 91% of all tires (~150.000 articles in Europe) to become A-label, all tires are tested successfully, homologated and all existing tire molds have to be replaced before being introduced on the market.
     → then exchange of all tires in Europe within 4 years

Reminds that the 3dB tighter tyre noise limits will already be used from 2022 to reach the current Phases 2 & 3 of UN-R51-03. This reduction is expected to be fully implemented in 2026.
→ no further changes or improvements after 2026

3. *Indication of the level of realism in the different scenarios should be indicated.*

Main points discussed from this presentation:

- It has been reminded that tyres were out of the scope of the Emisia study. So in the CBA, this is purely fictional. It is mentioned in the Introduction of the Chapter 5 of the Emisia study "Proposal for Phase 4 limit values" that the tyres were out of the scope without mention to the level of realism of the scenario.

Conclusion: *to be considered with item 1.c) with both EMISIA & ATEEL studies.*

5.	**Preparation of the next steps for this group according to the guidelines adopted at GRBP-74** Table – Doc. Published under TF-VS process → check by speakers	GRBP-74-03 TFVS-10-05 TFVS-11-07 Rev.1

Reminder:

A table to list all presentations done during the 11 Sessions of the TF-VS has been established with a kind of classification.

➔ **As kind reminder: Request to all speaker to review this classification and to come back to Ms. Silvani as Secretary of the TF-VS group for any additions/corrections/suggestions.**

Other points discussed:

- **(EC) DG/GROW & DG/ENV** inform the group that they plan to work together on the Noise Emissions subject to develop an appropriate & suitable workplan.

- The group supported that from the 11 Sessions of the TF-VS, it is now the good time to prepare a **Report to give an overview and a common view** on what is the situation.
  Conclusions*: This report will be prepared by the Secretary of the TF-VS with the support of volunteers: Mr.Boersma (NL), Mr.Barbeau (France), Mr.Steffan (ETRTO), Mr. Neuhaus & Sturk (OICA) and Mr.Ito & Mr.Shirahashi (Japan)*.

6.	**Cross-matrix** Work of the subgroup: status & next steps → work in progress – to be followed at next session – no update for today	TFSL-01-05 Rev.1 TFSL-02-07 TFVS-04-14 TFVS-05-06 (expl.) TFVS-06-05 (Tbl.) TFVS-07-05 (Tbl.) TFVS-07-08 (expl.) TFVS-07-13 (NL) TFVS-08-06 TFVS-09-06

The work is still in progress through the subgroup (OICA Mr.Neuhaus/ ETRTO Mr.Steffan/ NL Mr.Boersma/ Mr.Steven).

Conclusion*: Meetings are scheduled to work on this topic. A presentation should be possible at next Session of this TF-VS ~March 2023.*

7.	**Guidelines of the taskforce: approved at the 03rd session → to be followed at GRBP-74 in September 2021**	TFSL-03-03 Rev.1 TFVS-04-05 GRBP-74-03 Rev.1
8.	**GRBP Status report preparation → GRBP-75-32**	TFVS-04-07 → GRBP-74-39

		TFVS-07-06
9.	**Any Other Business ?**	
No other topics discussed during this 11th Session.		
10.	**Next meeting(s)**	
Next meeting should be in March-April 2023. To be defined later.		
11.	**Adjourn**	
Mr. Ficheux thanked the participants for all very good & interesting presentations, as well as very fruitful discussions.		

All documents of this TF-SL are/will be available via the UNECE website - Task Force on Sound Limits (TF-SL)/Vehicles'Sound (VS).