

**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 09<sup>th</sup> Session of the Task Force on Vehicles Sound TF-VS On Tuesday 24<sup>th</sup> May from 10:00 to 16:00 (CET)

[Hybrid \(ACEA Office, 6 Rond-point Schumann, Brussels\)](#)

		Working Documents <small>(*) not available before the meeting</small>
1.	<b>Welcome and opening remarks</b>	
<a href="#">Mr.Ficheux welcomed the participants to this 09<sup>th</sup> Session.</a>		
2.	<b>Introduction of participants and organizations</b>	TFVS-09-02 (*)
<p>Attendees this 09<sup>th</sup> session of the TF-VS agreed for sharing with the group:</p> <ul style="list-style-type: none"> <li>▪ the attendance list as proposed under document TFSL-09-02,</li> <li>▪ any documents used and/or presented during this Session,</li> </ul> <p>and making them public on the UNECE website.          Attendees in person are highlighted in the attendance list.</p>		
3.	<b>Adoption of the agenda</b> <b>Adoption of Report of 08<sup>th</sup> session</b>	TFVS-09-01 Rev.1 TFSL-08-10 Rev.1
<p><a href="#">Agenda as Document TFVS-09-01 Rev.1 is adopted.</a>  <a href="#">No additional comment on report of the 08<sup>th</sup> Session → report as TFVS-08-10 Rev.1 is adopted.</a></p>		
4.	<p><b>Exchange of information on national and international requirements</b></p> <p>a. (EC) studies on vehicles' sound emissions for</p> <ol style="list-style-type: none"> <li>1. M, N vehicles' noise (HS Data Analysis and Consultancy-TNO-Aristotle University of Thessaloniki)            Link to the official report: <a href="#">Study on sound level limits of M- and N-category vehicles - Publications Office of the EU (europa.eu)</a></li> <li>2. L vehicles (Idiada)            Link to the official report: not yet available</li> </ol> <p>b. (Brussels Environment) Evaluation of vehicle noise emissions individually motor vehicles circulating in Brussels-capital region</p> <p>c. Any other national information?</p>	<p>TFSL-02-08            TFVS-06-03            TFVS-07-11            TFVS-09-03 Rev.1</p> <p>TFVS-04-15            TFVS-09-04</p> <p>TFVS-08-05            TFVS-09-05            TFVS-09-07</p>

### a.1. (EC) studies on vehicles' sound emissions for M, N vehicles' noise (HS Data Analysis and Consultancy-TNO-Aristotle University of Thessaloniki)

- **Introduction by Mr.Paviotti** who reminded the context of this study on the future developments of the limits for the M & N categories of vehicles.

At least in the EU, there is a framework with 2 political programs: the 'Zero pollution action plan' and the 'Smart & sustainable mobility strategy'.

Noise is recognized as one of the issues due to its impact on human health.

The ambition is to reduce by 30% the chronically disturbed by noise by 2030.

Through this study, they would see from a coherent and complete vision of all the legal instruments that deal with noise, if there is a need to update the limits for the road vehicles.

Work is also in progress with the road authorities because of the intersection for this issue between the car manufacturers, the tyre manufacturers, the road authorities.

From the perspective of the health, the aim is to identify the benefit they can reasonably derive from it.

- **Presentation by Mr.Steven** on behalf of the EC consortium → for details, see document TFVS-09-03 Rev.1:

1. Introduction
2. Feedback gathering and literature review
3. Testing of vehicle's sound emission values
4. Cost benefit analysis
5. Proposal for phase 4 limit values
6. Discussion about amendments of the measurement method and ASEP requirements

- **Some of the main topics highlighted during the discussions**

- Chapter 3 - Testing of vehicle's sound emission values:

- Slide 19: the aim of this slide was 'only' to show if the concerned vehicle is far away or close to the phase 3 limits.
- Slide 20:
  - Comparison between different categories of vehicles always difficult and has to be considered carefully.
  - How to be as representative as possible of the real world, of what is really happening in the street? A package of a lot of different things (some of those elements are not covered by regulations) & their relationships have to be considered for a real improvement in the environment → discussions to be continued with ASEP & RD-ASEP.
  - Have also be considered:
    - The power vs. the engine speed
    - Manipulation of vehicles
    - Driving behaviors
    - Scope, aims, obligations & responsibilities for each parties (car manufacturers, drivers, ...)
    - What can be covered by regulations
- Slide 25: conclusion seems not to be appropriated for this kind of vehicle → recommendation for checking again the selected gear/ acceleration (target =  $2\text{m/s}^2$ ) / Kp. Agreed that margins have to be considered.
- Slide 26: in this case for hybrid vehicle,
  - Depth analysis for 'wot' test to be done to clarify what is really coming from the engine and/or from acceleration rate
  - again comment on acceleration which should be below  $2\text{m/s}^2$  according to the test procedure in UN-R51-03

Tests have been done on a 'small' sample of 16 vehicles which helps to draw some general conclusions. Through chapter 5, additional consideration have taken into account before concluding phase 4 proposals.

According to practical experiences on N1 vehicles of some attendees, the tyre noise remains dominant compared to engine noise as for M1 vehicles.

- Slide 31: in the part related to the 'Intake orifice & rest', the 'rest part' is the dominant factor.
- Through the sample tested for N3 vehicles, the type of tyre is not such a big issue.
- It was reminded especially for heavy vehicles that the technical decision related to the measurement procedure was done ~20 years ago to accommodate how the vehicles were really driven in traffic. It was the goal of the new test procedure. Tests for passenger cars and heavy vehicles are different.

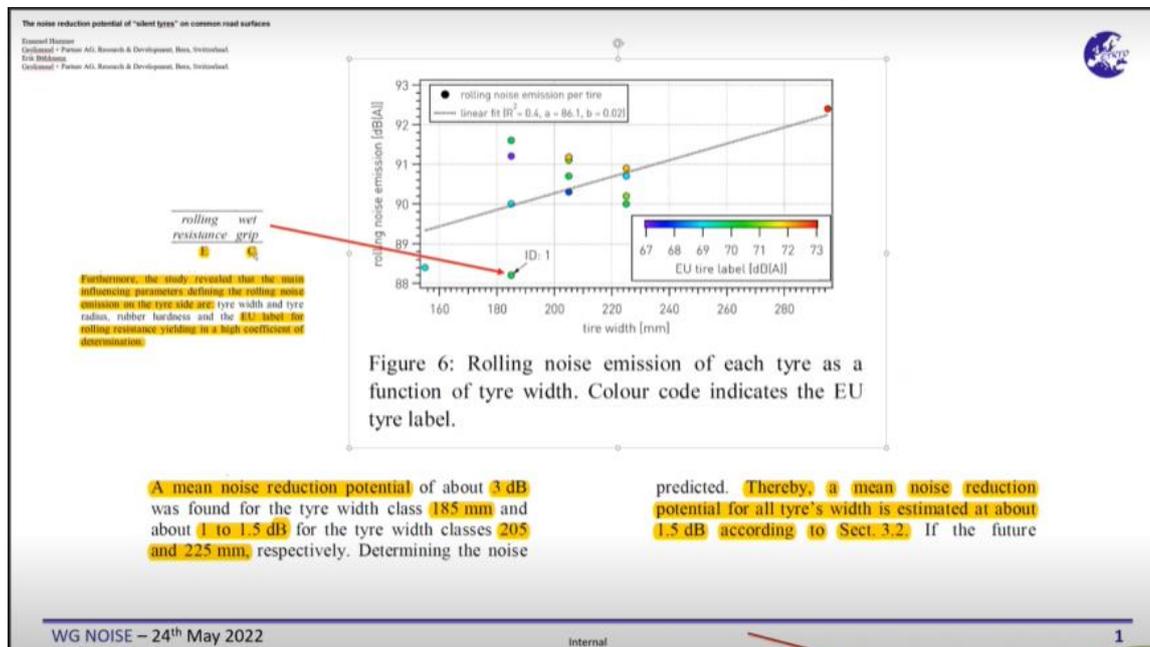
M1 vehicles have a wide-open throttle test and a cruise test for the purpose of approximating the partial throttle, which is how they really drive.

Same for heavy commercial vehicles. They really drive more up at the higher engine speeds with decision at that time with full acceleration test for the heavy vehicles.

- §.3.8. of the report - Assessment on  $L_{urban}$  reduction tests: for N3, it has been reminded for an additional reduction of the noise limit values, the encapsulation which could be a potential solution has to be considered carefully due to its 'non-linear' behavior, impact on the engine temperature, weight, ... Even if engines become more silent, technical feasibility has to be taken into account.

#### • Chapter 4 – Cost Benefit analysis:

- Slide 86:
  - Tyres become the dominant noise source on the vehicle and especially for electric vehicles in the future
  - Additional explanations on scenario F would be helpful to better understand:
    - the link between this proposal (xdB reduction) and the current real situation in the street/market vs. the different phases of the UN-R.
    - other available studies as those from Switzerland:



- the representativity of the samples considered
- the size of tyres considered
- tyres performances to be considered together, especially for noise & rolling resistance – priority between noise & CO<sub>2</sub>?
- the technical feasibility
- the reference to be used for the reduction of additional dB
- the time frame which has to be realistic at least for the manufacturing time of tyres molds

- the tyres market penetration rate for new vehicles and also for vehicles already on the market with its impact on the  $L_{DEN}$
    - lifetime of tyres including its variation due to different events as the use of winter tyres in some European countries (life time of usual tyres ~6-8 years instead of 3-4 years), development of homeworking reducing the use of vehicles, ... to be considered
    - impact of the variation of the current traffic fleet with introduction of electric vehicles
  - It was reminded that in this study, we have hypothetical scenarios with presentation of the different potential options for health benefits from decreasing noise to inform policymakers which directions can be investigated to achieve realistic and measurable limits.
  - In a 1<sup>st</sup> approach, tyre road noise is dominant and at least for M1 vehicles, tyre noise has to be considered before tightening limits on vehicles
  - Several attendees highlighted the need to really be realistic regarding the different possible options
- Chapter 5 – Proposal for Phase 4 limit values:
    - It has been reminded for vehicles N2 & N3 that
      - the split in the classification at 135kW was a compromise between Europe (nothing below 135kW) and Asia (a lot of vehicles around 135kW). To keep in mind and to be considered for phase 4.
      - Limit values of N2 cannot be used for N3 because the engine target conditions are different during type-approval.
      - When one vehicle from RDW database is analyzed, we have to keep in mind that this vehicle is covering a lot of variants according to the customer's request. For any proposal related to the reduction of the limit values, all the different variants (including different number of axles) have to be considered to fulfil the regulation.  
Wide HCV variety of specification to fit under the TA categories (need for appropriate margin to TA limit values):
        - <https://unece.org/DAM/trans/doc/2011/wp29grb/ECE-TRANS-WP29-GRB-53-inf17e.pdf> (slide 19)
    - HCV tyre sound emission dispersion/ variability, see presentations at GRBP:
      - <https://unece.org/DAM/trans/doc/2010/wp29grb/ECE-TRANS-WP29-GRB-51-inf20e.pdf>
      - <https://unece.org/DAM/trans/doc/2010/wp29grb/ECE-TRANS-WP29-GRB-51-inf13e.pdf>
    - For the database analysis, the difference has been done between electric, hybrid and Ice vehicles. Electric vehicles and other specific vehicles have been disregarded accordingly.
  - Chapter 6 – Discussions about amendments of the measurement method & ASEP requirements:
    - Slide 150: interpretation of this slide to be checked because  $n_{Max}$  limitation is a curve that is affecting only extreme low powered vehicles because they exceeded a rated engine speed. That was on request of Japan because of difficulties in the introduction of autonomous driving vehicles with PMR around 20 to 25 which always exceed rated engine speed.
    - It is important to understand and consider the background of previous decisions/requirements done in the current regulation, and this in taking into account acceleration, torque effect, electric/hybrid/ICE vehicles, tyres, sum of power of the combustion engine and the electric engine, power to mass ratio, ...
    - A lot of improvements to the current UN Regulation through 6 Supplements have already been done in UN-R51-03 (the backfire issue, the inclusion of sound enhancement systems, re-definition of control range, GRB-68-03 to decide that ASEP at the moment is only tested at full

- throttle to also cover partial load) and step per step there is a margin for further improvements. Improvements are continuing and for that in addition to industry works, active participation from all Contracting Parties (including European Member States) is also needed.
- These 6 supplements to UN-R51-03 have not yet been transposed to the (EU) Regulation and should be introduced as fast as possible in (EU) Regulation 540/2014 with maybe some fine tuning.
  - Electrification is coming and will change the game. This part has also to be considered for the future.
  - Regarding the context of this study from the EC, it has been reminded:
    - This was a general study entrusted to an independent consultant for providing any recommendations in the scope of this study
    - Debates at international level are important. The decision through the EU legislative procedure depends not only on the availability of technical findings or some new advancement, but also on other parameters such as the political willingness, the timelessness for the amendment to be brought forward, and not only at EC level but also as much as possible to be aligned at international level.
    - Onsite checks, driving behaviors, European END, authorities in charge of the roads, local authorities (fleet management) have also to be considered when we talk about single events.

The chair thanked especially Mr.Stevens for accurate and good presentation, as well as all the participants for the intensive discussions. He also reminded that this TF-VS group is the right place for any discussion, better understanding, sharing of opinions and/or proposals and so on.

***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 in July.

#### **a.2. (EC) studies on vehicles' sound emissions for L vehicles (Idiada)**

- **Presentation by Mr.Garcia** from Idiada on behalf of the EC consortium  
→ for details, see document TFVS-09-04:
  1. Estimate of L-categories fleet representativeness in sound emission
    - a. Feedback gathering questionnaire
    - b. Literature review
  2. Verification of Sound level limits
    - a. Vehicle selection
    - b. Vehicle testing
  3. Noise source ranking tests (NSR)
  4. Cost-Benefit analysis
  5. Proposal for sound emission limit values

Due to the lack of time, only chapters 1, 2, 3 have been presented in detail + Slide 58 with conclusion.

The different scenarios:

- A. Only reduction of tampering (0, 5 or 25% of illegal exhaust systems)
- B. Combination of anti-tampering actions + 2dB reduction
- C. Anti-tampering + 4dB reduction
- D. Anti-tampering plus 2 + 2dB delayed in time (in 2-steps)

'Unfeasible region' because of 2 reasons:

1. Technical: not possible more than 3dB, and
2. Cost too high

With very short words, more than 2dB is a technical feasibility limit.

The challenge is selecting what we want to achieve: either very effective but with low benefit, or something less effective but with higher benefit. Decision on strategy will have to be done by MS.

- **Some of the main topics highlighted during the discussions:**

o Slide 58:

- from comparison between scenarios D & B, the cost benefit ratios are similar. Does it mean that -4dB has the same CBA that -2dB?

Scenario D is a 2-steps reduction with higher costs and higher benefits.

Relatively same ratios, but in scenario D much more uncertainties for both costs & benefits.

From comparison between scenarios D & C, the 2-years of additional lead time changes the cost benefit completely.

The scenario C would be much more difficult to achieve, because technically doing such a project in a such quick step and in a short time would involve very high initial costs, and that without the benefit from the gradual introduction of the -2dB.

- The report is finished but needs to be transposed into EC format. It should be available by the end of May/beginning of June.

- This study confirms the need to address tampering issues with regards to motorcycle's noise as an urgency.

This topic could be done through the (EU) Regulation 2018/858 with the Forum in charge of the Market Surveillance and some of the dedicated subgroup meetings.

This issue could be addressed in September in this Forum in the front to all the authorities to start discussions and see possibilities on how the enforcement can be brought out.

This should be a joint action together DG/GROW-DG/ENV and also DG/MOVE. PTI is important for preventing tampering.

Even if usually tampering issues are coming mainly from after-market, vehicles manufacturers can do more or less nothing and the market surveillance potential issues and limitations, the idea would be to just start the discussion at Forum in September and see possibilities on how to bring about enforcement.

**Conclusions:** *next meeting TFVS-10 in July 2022 will start with this topic to come back to the presentation especially for Chapters 4 & 5 (not presented during this session due to the lack of time), and any additional comments & questions.*

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**b. (Brussels Environment) Evaluation of vehicle noise emissions individually motor vehicles circulating in Brussels-capital region**

From document TFVS-09-05, presentation by Mr. Benoit FAUVILLE who is working on the environmental issues as noise analyst in the Noise Department of Brussels Environment.

Some of the main topics highlighted during the discussions:

- Additional tests are needed and planned especially for motorbikes and trucks to be more representative.
- Accurate analysis was possible with collection of various data as age, type of propulsion, ... from the registration plate (only Belgium plates) with the support of the federal public transport service.
- Mismatch between different study vs. real world is helpful to show that only pressure on vehicle is not enough. In parallel it has to be considered the use of the vehicle, manipulation, etc. with a potential penalty such as a fine.
- Suggestion done for future tests to also consider the tyres and especially their width which could explain what has been observed for electric vehicles and trucks.
- Other important points: Tests presented have been measured at 5m instead of 7,5m in the Regulations, and on wet surface.

Corrections needed to be able to make accurate comparison regarding the values measured (something as 2dB(A)).  
 This has to be clear for instance through a footnote for 'public people'.  
 - Slide 17 - Vehicle age seems to have almost no impact in real world  
 → does it mean that in the future, lowering the  $L_{urban}$  value will change nothing in real world?  
 Here we have the overall level of the vehicles and we do not see the composition. One explanation could come from the evolution over time of the noise distribution between the tyre rolling sound and the powertrain sound.  
 Tyre noise has been improved. Nevertheless the combination of the vehicle noise and the tyre noise is here not visible. Working on limits is not bringing tangible effects in real life in this case.  
 Could also be linked to the more intensive use of wider bigger tyres and extra load tyres.

**Conclusion:** big interest from the group for this presentation and to follow next steps with future works led by Brussels Environment.

c. **Any other national information?** → No additional information

5.	<b>Cross-matrix</b> Work of the subgroup: status & next steps	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
Due to the lack of time, this topic has not been discussed during this 09 <sup>th</sup> Session.		
6.	<b>Guidelines of the taskforce: approved at the 03<sup>rd</sup> session → to be followed at GRBP-74 in September 2021</b>	TFSL-03-03 Rev.1 TFVS-04-05 GRBP-74-03 Rev.1
7.	<b>GRBP Status report preparation → GRBP-75-32</b>	TFVS-04-07 → GRBP-74-39 TFVS-07-06
8.	<b>Any Other Business ?</b>	
No other topics discussed during this 09 <sup>th</sup> Session.		
9.	<b>Next meeting(s)</b> - <b>10th Session on July 12, 2022 (hybrid in Paris at OICA office)</b> - <b>11th Session on</b> o <b>TFVS on September 09, 2022 (hybrid in Geneva)</b>	
10.	<b>Adjourn</b>	
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 \(VS\)](#).