Category(ies) of vehicle : M, N & L (ICE & xEV)

# (BRUSSELS ENVIRONMENT) TESTING THE NOISE EMISSION OF INDIVIDUAL MOTOR VEHICLES IN THE BRUSSELS-CAPITAL REGION

**DRIVING BEHAVIOUR**
**VEHICLE AGE, CAT., PWT, MASS, POWER**

## MAIN MESSAGES FROM THE PRESENTATION(S)

- The noise of each vehicle was identified in real situation at the 2 exits of one roundabout at a distance of 5 m from the passage of vehicles.
- One of the interests of this campaign lies in the access to data of each vehicle measured, speed and acceleration, but also model, type of vehicle, year of entry into service, etc. registered during the measurements in acceleration and with a moderate speed
- Conclusions
  - Reducing speed & acceleration will significantly decrease the noise emission → Decision done in Brussels since Jan.01, 2021 to reduce the speed to 30km/h leading to 10-20% of the population below the WHO guide values
  - Encourage public transportation
  - Prefer light vehicles (not too powerful)
  - No benefit with newer vehicle
- Next steps & goals:
  - Improve statistics for certain types of vehicles through 3 measurement campaigns per month in 2022
  - Test 'noise radar' technologies

## SUMMARY


- In autumn 2020, The Real Urban Emissions (TRUE) assessed the air pollutant emissions of several thousand vehicles circulating in the Brussels-Capital Region. At the same time, Brussels Environment carried out noise level measurements at crossings on some of these vehicles, in a situation of acceleration and moderate speed.
- Factors analysed & their conclusions
  - Speed & acceleration → high impact of speed (rolling sound) and acceleration (engine noise) on noise emissions
  - Vehicle category → PC & LCV similar (+1dB) – Compared to PC & LCV, motorbikes & busses have a level +4dB, and for trucks +7.5dB
  - Vehicle age → almost no influence on the noise
  - Type of propulsion → a few differences between the different types of propulsion:
    - Petrol slightly less noisy than Diesel
    - Hybrid often in thermal mode
    - Additional measures are needed to highlight differences in the levels emitted for electric vehicles, which are under-represented during this measurement campaign. However, the first analyses highlight sports electric vehicles that are noisier than the average diesel or petrol vehicle.
  - Mass & power → general conclusion difficult because of the overrepresentation of private cars

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**ADDITIONAL POINTS FROM DISCUSSIONS IN THE UN TF-VS**

- 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 sound 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 in order to be able to make accurate comparison regarding the values measured (about 2dB(A)). This has to be clear for instance through a footnote for 'public people'.
- 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.

**REFERENCES**

- TFVS-08-05 (TFVS Sec.): Informal General overview - EVALUATION OF VEHICLE NOISE EMISSIONS INDIVIDUALLY POWERED VEHICLES CIRCULATING IN BRUSSELS-CAPITAL REGION
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