

Transmitted by the expert from the ETRTO

Informal document **GRB-56-14**
(56th GRB, 3-5 September 2012,
agenda item 9)



Holistic approach for rolling noise mitigation

**GRB 56th
Sep 3 – 5, 2012**



Content

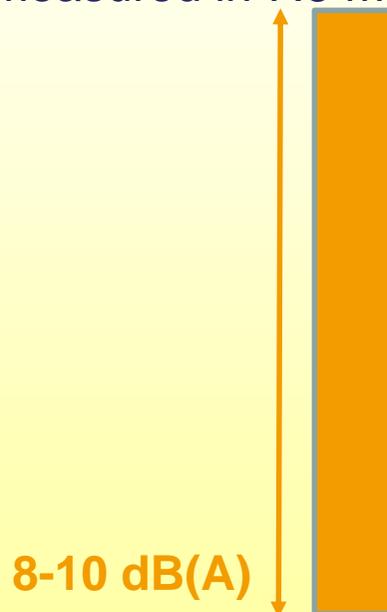
- ▶ **Introduction**
- ▶ **Basic functions of the tyre**
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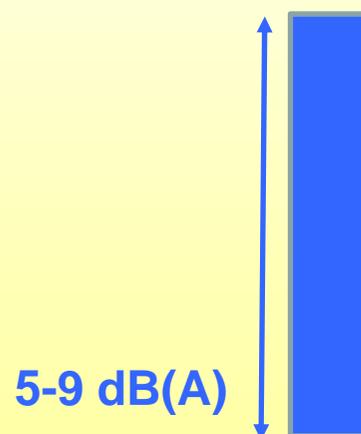
Road Pavement Potential

Tyre influence compared to road and speed

Different roads with the same tyres measured in 7.5 m



Vehicle speed from 80 to 50 km/h



Tyre of same size and category



Road and speed can be controlled locally where annoyance is shown through noise mapping (EU Dir 2002/49 in EUROPE)



Tyre Basics – Contribution to vehicle properties

- Handling**
- Tyre characteristics
- High Speed



- Safety**
- Braking (dry & wet)
- Aquaplaning

- Comfort**
- Mechanical comfort
- Acoustical comfort

- Economy**
 - Mileage Performance
 - Fuel Consumption
- ➔

- Environment**
- CO2 emissions
- Rolling Noise nuisance



What are the interactions between tyre and road to produce the road / tyre / vehicle performances?

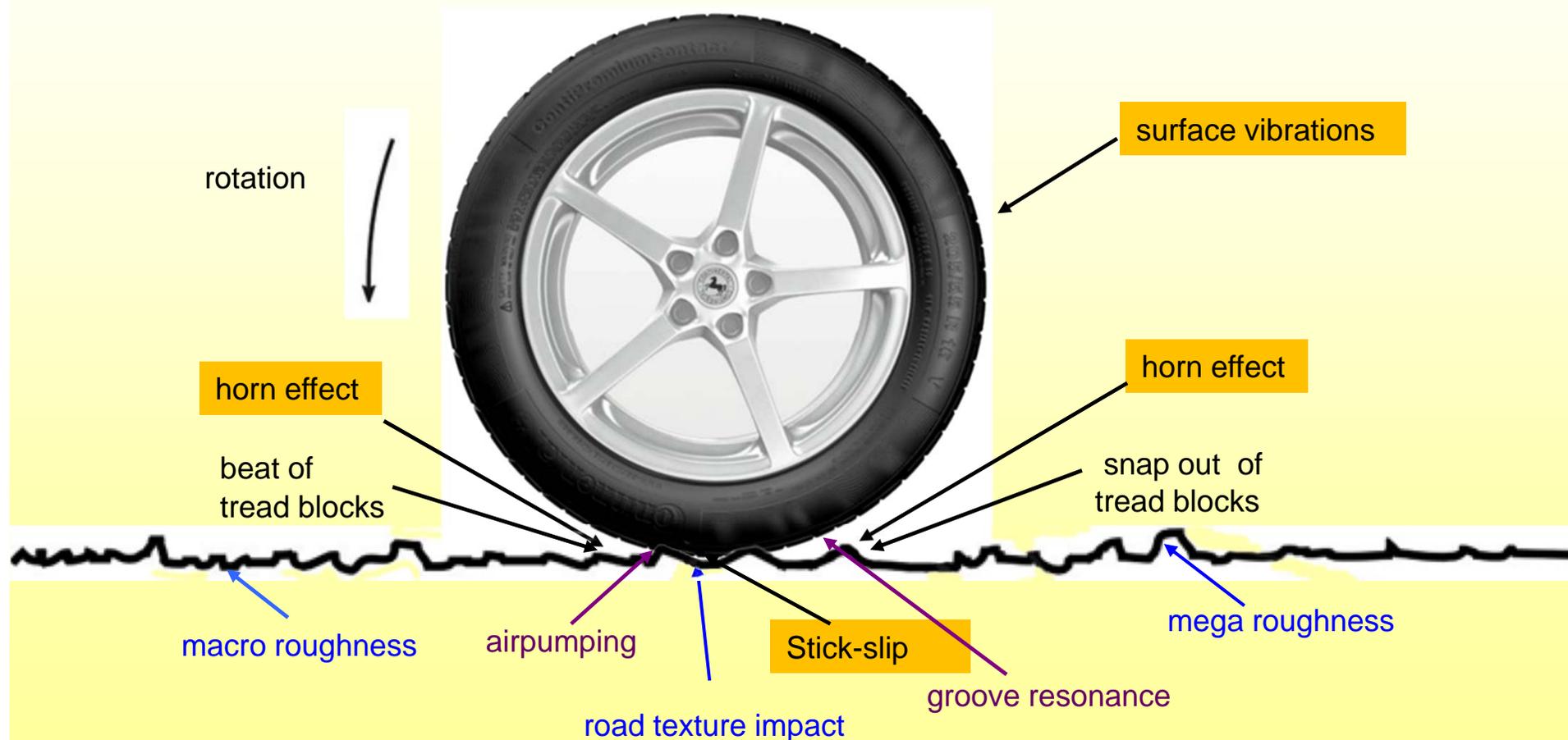
To what extent can tyre manufacturers, road manufacturers, and road owners act independently, or should they join their efforts to make progress on:

- ▶ Emissions: ROLLING RESISTANCE**
- ▶ Safety: WET GRIP**
- ▶ Pollution: NOISE**

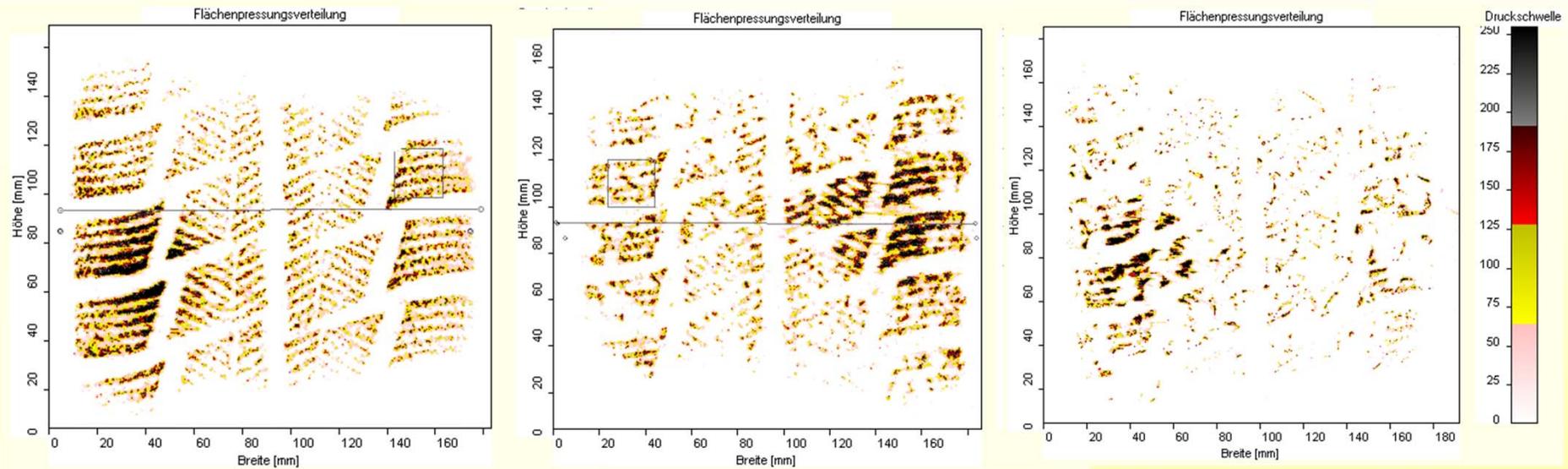


Noise mechanisms for tyre/road noise

road pavement influenced



Tyre excitation



Asphalt accord. ISO 10844

SMA 0/8

SMA 0/11

Pressure in the foot print on different road surfaces

- ▶ **Depending on the roughness and the waviness of the road surface the tread pattern of the tyre or the road surface texture is predominating. An effective decrease of rolling noise without measures on road making is not possible.**



Close proximity measurements: CPX

The use of Standard Reference Test tyres allows to classify road pavement for rolling noise emissions on a normative basis.



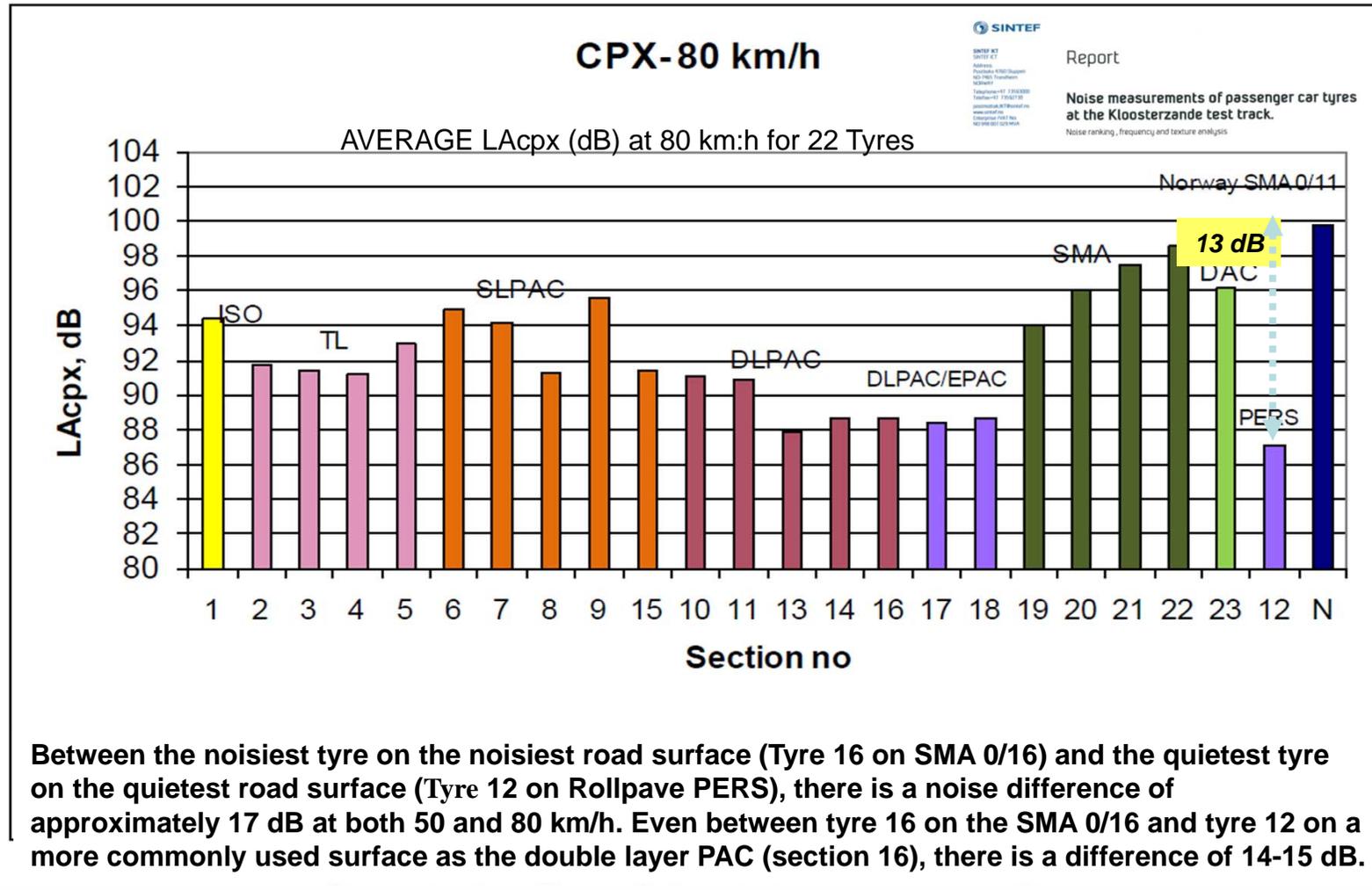
Trailer Types CPX

The European Tyre and Rim Technical Organisation

Müller BBM GmbH
DAGA 2010



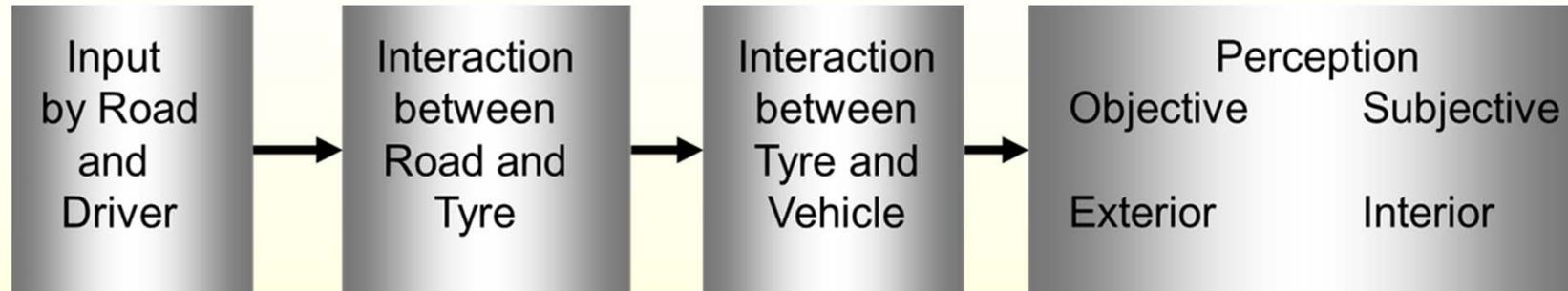
Variation of the tyre/road noise on different surfaces



Truls Berge, Noise measurements of passenger car tyres at the Kloosterzande test track, 2011



Road noise mitigation requires - global approach



- ▶ The approach for efficient societal benefit for rolling sound emissions has to be considered on a global basis where the main actors are the pavement, the tyre & the vehicle.
- ▶ Traffic flow management & driver behaviour need to be included in this global approach.

Tyre/road noise in real life is generated on a wide range of different road surfaces.



View on further works to be performed

- ▶ **Need for regulations, harmonized procedures or policies for low noise pavements and other noise reducing measures; in particular, harmonised procedures for classification, check of conformity of production of road surfaces.**
- ▶ **Many solutions for noise reduction have been developed. Further noise reducing measures are needed for:**
 - ▶ improving the mix design of the pavement
 - ▶ promoting the next generation for low noise surfaces
 - ▶ promoting low noise dense surfaces for urban areas
 - ▶ optimization of low noise concrete pavements, both technical and subjective (acceptability by the population)
 - ▶ sharing knowledge and experience

AIPCR WORLD CONGRESS –MEXICO 2011- S/C 2A-WG ROAD NOISE MITIGATION



Thank you