



European Federation for
TRANSPORT and ENVIRONMENT

BACKGROUND BRIEFING

EC proposal for Tyres in Type-approval Requirements for the General Safety
of Motor Vehicles COD 2008/100

October 2008

Tyre standards: addressing safety, climate change, traffic noise and resource use

At first sight there may appear to be little difference between models of tyre. But tyres strongly influence the environmental performance of vehicles: the majority of road traffic noise comes from tyre/road contact, and tyres determine 20-30% of a vehicle's fuel consumption and hence CO₂ emissions due to rolling resistance.

The proposed Regulation¹ offers a unique opportunity to address many of the environmental impacts of tyres: to cut road traffic noise; fuel consumption and greenhouse gas emissions; resource use and waste. These measures save fuel, increase tyre life and reduce noise whilst also ensuring a high level of safety.

Today's best available tyres can cut traffic noise in half, save over 5% of fuel (and therefore CO₂), and offer further savings through use of tyre pressure monitoring systems (TPMS). All this without compromising safety.

Quiet and low energy tyres are widely promoted by manufacturers but there is no way to make fair comparisons. There is no definition of an "energy saving" or low rolling resistance tyre. The current tyre rolling noise standards are so weak that they are hopelessly ineffective at reducing road noise.² TPMS which allow drivers to monitor the condition and fuel consumption of their tyres, are available as an optional extra on new vehicles in Europe and yet are fitted as standard for the US market.

Summary of T&E's views

The standards set by this Regulation for tyre rolling noise, rolling resistance and TPMS must reflect currently available technology and, in a second phase, set the pace for future improvement to make a substantial contribution to EU climate and health protection goals *before 2020*;

- **Effective environmental standards for tyres will not compromise road safety;**
- **Measures to tackle noise and to reduce greenhouse gas emissions at the source are far more cost-effective than remediation measures;**
- **Rolling resistance: the Commission's proposal for the second stage standards are already achievable now. The role of a second phase should be to set the pace of future market development to achieve real fuel savings and emissions reduction.**
- **Mandatory TPMS requirements for cars should stipulate a minimum level of accuracy to ensure safety and optimal fuel efficiency;**

- **Mandatory TPMS should be extended to commercial vehicles by 2012;**
- **A second phase of tyre noise standards is necessary by 2017 to provide certainty and drive the market towards quieter tyres;**
- **Truck tyre noise is a serious and growing source of traffic noise. Truck tyres are currently on sale which are 10 times louder than the best models; these should be removed from the market.**
- **If the standards are to have any notable effect before 2020, faster implementation is needed.**

Five per cent fuel and CO₂ savings

Tyre rolling resistance determines 20-30% of a vehicle's fuel consumption. If appropriate standards are set, low rolling resistance tyres can reduce fuel consumption and CO₂ across the EU car fleet by 5%. This equates to 50 Mt CO₂ per year in the EU.³ Rolling resistance is even more influential and fuel savings are even greater (5-9%) for trucks.

The EC proposal contains two stages of limits. The first stage will reject only 10% of the least fuel-efficient tyres currently on the market.⁴ Even the second stage proposal only offers a 3% fuel saving overall, equivalent to 30Mt CO₂ per year. T&E proposes to bring these limit values into force earlier and to set stricter limit values for the second stage. T&E's proposal would mandate a further 2% improvement in fuel efficiency at the second stage, to achieve the total potential reduction of 50Mt CO₂ per year. A stricter second stage is necessary to stimulate innovation to a level close to that of the best models currently available:

T&E proposal on rolling resistance (kg/t):

Tyre class	EC proposal First stage	EC proposal Second stage = T&E recommendation First stage	T&E recommendation Second stage	Current best available technology
Car (C1)	12	10.5	9	8.8 (US data: 6.3)
Van (C2)	10.5	9	8	7.8
Truck (C3)	8	6.5	6	4.2

Half the market already meets the first stage standards recommended by T&E. One in 10 tyres already meets the recommended second stage – so the technology is already available but widespread market introduction should be promoted.

T&E's second stage proposal would offer an additional 2% fuel savings over and above the Commission proposal; a substantial amount for both drivers and businesses facing high fuel prices, and equating to an additional 20Mt CO₂ reduction per year.

Accurate tyre pressure monitoring systems (TPMS) save fuel and enhance safety

Approximately half of all cars are driven on under-inflated tyres and up to 79% of drivers admit to not checking tyre pressure. TPMS can alert drivers to pressure loss which risks safety and reduces fuel efficiency. TPMS can reduce fuel consumption and hence CO₂ and air pollutant emissions by a further 2.5%.⁵ The Regulation mandates TPMS for cars. This should be welcomed.

However, the proposal falls short by failing to define a minimum level of accuracy to achieve the objectives, which means that mandatory application of TPMS could be ineffective or even dangerous. TPMS should give drivers an urgent warning of pressure losses of 0.5bar, which is critical for safety and alert drivers already to a pressure loss of 0.3bar at which level fuel is wasted. TPMS with this level of accuracy are already available and achievable without prescribing a particular measurement technology and could save 11.5 Mt CO₂ per year.⁶

Under-inflated tyres also wear out more quickly, and therefore need replacing more frequently. TPMS capable of detection of 0.3bar pressure loss can decrease tyre wear by 11% on average, with knock-on benefits in terms of reduced waste and reduced use of the materials used in tyre production. This represents an additional saving of 1.3Mt CO₂ emissions across the car fleet per year.⁶

TPMS is currently available at a cost of €25-40 per vehicle, costs would fall with mandatory fitting.⁷ Savings in fuel and tyre wear will be worth €12-49 per car per year, so drivers should recoup any additional cost quickly.⁸

The Regulation should also set a deadline of October 2010 for the Commission to study feasibility and impacts and propose mandatory TPMS for vans and trucks if appropriate.

Set long-term goals to halve traffic noise

Traffic noise is the top source of annoyance in urban areas and a widespread public health problem.⁹ Over 210 million EU citizens are exposed to road noise levels which put their health at risk, according to WHO recommendations, as well as causing annoyance, stress and sleep disturbance.¹⁰ Road noise is also shown to hinder children's learning progress.¹¹

The contact between the tyres and the road dominates traffic noise at vehicle speeds over 40-50km/h, so is the main noise source on most urban roads and motorways.¹²

The costs of traffic noise are widely recognised and are estimated at over €40billion per year across the EU.¹³ This includes reduced property values in affected areas and the costs to local authorities of erecting noise barriers or installing insulation. However, the toll on health, sick leave, lost productivity and quality of life are not included and merit particular consideration.

The overall potential for traffic noise reduction from newly manufactured tyres given today's available technology is 2-4 decibels.¹⁴ Every noise reduction of 3 decibels means that volume is halved: the same noise effect as halving road traffic!

The proposed tyre noise limits for car tyres (C1) are very reasonable: Between 46-75% of tyres on today's market already meet the suggested limit values (proportion varies between different classes). However, car tyres are already on sale in Europe that are 8 decibels quieter than the current standard, so the Regulation should already foresee a second step to drive the market in a quieter direction.¹⁵

T&E proposal on noise from car tyres, second stage limit values, for introduction in 2017 (decibels):

Tyre classes (passenger cars)	size	EC proposal from 2012 (one phase only)	T&E recommends: new 2 nd phase from 2017
C1 A		70	68
C1 B		71	69
C1 C		71	69
C1 D		72	70
C1 E		74	71

The complete research and development renewal cycle for car tyres is five years, so introduction of a second phase of standards in 2017 is reasonable whilst minimising additional costs, and providing planning certainty for manufacturers. It is desirable to tackle the unsustainable trend towards larger and noisier models by reducing the limit value differential between size classes.

Targets also needed for freight transport

Road freight transport is growing rapidly, and with it the noise from trucks and their tyres. Trucks have become significantly quieter thanks to technology forcing standards, but louder tyres undermine the overall effect. For truck tyres, the spread between loudest and quietest currently available models is 10dB (the loudest is ten times louder than the quietest).¹⁶

The Commission proposal is too lax, particularly on standard truck tyres (C3), where 75% of models already comply. The proposal for snow tyres is more reasonable, where 59% already meet the proposed limit values. Of van tyres currently available (C2), 53-64% fulfil the proposed noise limit value.¹⁷

T&E proposal on noise from commercial vehicle tyres (decibels):

Commercial vehicle tyres	EC proposal	T&E recommendation First stage	T&E: new 2 nd stage from 2017
C2 Normal (van)	72	71	68
C2 Traction (van)	73	72	70
C3 Normal (truck)	73	70	68
C3 Traction (truck)	75	74	71

Approximately half of currently available commercial vehicle tyres already comply with T&E's first stage recommendations. The recommendation for the second stage is in line with the best technologies currently available: 10% of current models would already pass.

Achieve results before 2020

The Commission proposes to phase-in the requirements on rolling resistance and noise between 2012 and 2020. But results are needed more urgently. The timetable is not technically justifiable as technologies which fulfil even the second phase of rolling resistance requirements are already available. It will take around eight years after introduction of standards for the full benefits to be perceived.¹⁸

Bearing in mind the EU goals to reduce the number of people exposed to unacceptable levels of traffic noise, and climate targets, the Parliament should demand a speedier implementation of the new rules.

No safety compromises

The Commission proposal ensures that safety performance of tyres will not be compromised. There is no trade off between noise performance and safety. Nevertheless, the proposal sets minimum 'wet grip' standards to ensure that safety will not be compromised in pursuit of lower rolling resistance.¹⁹

Studies of large numbers of tyre models show that many are already available that perform well on rolling resistance and wet grip.²⁰ A small number of (budget, and mostly imported) models may concentrate on one criteria at the expense of others, the Regulation will ensure that these worst-performing models will be phased out of the market in the interests of road safety and environment.

Source measures are the most cost-effective, by far

Conservative valuations of the benefits of noise reduction are €27 per dB per household per year, however this figure does not take health service costs, sick leave and reduced productivity into account.²¹

Measures to make tyres, vehicles and roads quieter are indispensable. Even if authorities had increased resources to install building noise barriers and insulate homes, schools and hospitals where needed, noise levels from Europe's roads would still be exceed recommended healthy levels by around 10 decibels.²²

State-of-the-art quiet road surfaces have potential for up to 6dB noise reduction when new, but this decreases over time and with wear to a long-term average noise reduction of 3-5dB.²³ Low-noise surfaces are however extremely costly for public authorities and taxpayers at a cost of €1million per km for a main road and require more regular maintenance.²⁴ The benefits of applying quiet surfaces are maximised if a substantial proportion of the vehicle fleet is already fitted with quieter tyres. The costs are minimised if quiet surfaces are applied as part of the regular resurfacing cycle.

The cost-benefit analysis strongly favours measures to reduce tyre noise: Conservative estimates of benefits outweigh cost estimates by over 50% (without considering reduced health costs). It also clearly demonstrates that the costs of applying and maintaining low-noise road surfaces outweigh the benefits by one third, if measures are not simultaneously taken to introduce quieter tyres.²⁵

T&E's demands are already achievable.

The problems to be addressed are urgent: Climate change, traffic noise and resource use. Regulation to reduce the environmental impacts of tyre use is long overdue. The technology is already on the market, T&E's demands are realistic and achievable. Effective standards are needed now to bring the best technologies to the wider market and to contribute to health protection and climate goals by 2020.

Further information:

T&E website:
www.transportenvironment.org/Pages/transport-noise

Position papers on tyre rolling resistance and noise:
www.transportenvironment.org/Publications/prep_hand_out/lid:475
www.transportenvironment.org/Publications/prep_hand_out/lid:476

Video illustrating tyre noise potential and testing:
www.youtube.com/watch?v=h7n8Su8Fv9o

T&E (2008): 'Can you hear us?' Why it is finally time for the EU to tackle the problem of noise from road and rail traffic
www.transportenvironment.org/Publications/prep_hand_out/lid:494

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¹ Commission proposal COM(2008)316

² Directive 2001/43/EC and UNECE Regulation 117, identified as ineffective in Kropp and Kihlman(2007): *Reduction Potential of*

Road Traffic Noise and VTI(2008) : *Consumer label for tyres in Europe*.

³ T&E calculations based on EEA data (2006): EU submission to UNFCCC.

⁴ IPG (2008): *Tyre testing data and factsheet*.

⁵ UNECE GRRF TPMS Task Force Conclusion on TPMS (2008): Document TPM-03-02r1e:

<http://www.unece.org/trans/main/wp29/wp29wqs/wp29qrrf/qrrf-inftpm3.html>

⁶ UNECE GRRF TPMS Task Force Conclusion on TPMS (2008): Document TPM-03-02r1e and TPM-03-03r1e.pdf (Draft Cost/Benefits Analysis TPMS for M1 Vehicles)

⁷ Schrader Electronics, Continental, Knorr Bremser, EnTire, Beru presentation to GRRF taskforce: TPM-03-03r1e.pdf (Draft Cost/Benefits Analysis TPMS for M1 Vehicles):

<http://www.unece.org/trans/main/wp29/wp29wqs/wp29qrrf/qrrf-inftpm3.html>

⁸ Schrader Electronics, Continental, Knorr Bremser, EnTire, Beru presentation to GRRF taskforce: TPM-03-03r1e.pdf (Draft Cost/Benefits Analysis TPMS for M1 Vehicles):

<http://www.unece.org/trans/main/wp29/wp29wqs/wp29qrrf/qrrf-inftpm3.html>

⁹ WHO(2007): *Nighttime Noise Guidelines*

¹⁰ CE Delft (2008) : *Road traffic noise reduction in Europe* :

http://www.transportenvironment.org/Publications/prep_hand_out/id:495

¹¹ RANCH project:

http://www.wolfson.qmul.ac.uk/RANCH_Project/

¹² Sandberg, U., Ejsmont, J. A. (2002) *Tyre/Road Noise*

Reference Book (www.informex.info)

¹³ CE Delft (2008) : *Road traffic noise reduction in Europe* :

http://www.transportenvironment.org/Publications/prep_hand_out/id:495

¹⁴ W. Kropp, T. Kihlman, J. Forssén and L. Ivarsson, "Reduction potential of road traffic noise", Royal Swedish Academy of Engineering Sciences, report 2007.

<http://www.iva.se/templates/page.aspx?id=4354> p.8

¹⁵ IPG (2008): *Tyre testing data and factsheet*.

¹⁶ (FEHRL(2006) final report: *Tyre/road noise, Vol 2 Appendices, appendix A: Literature survey*)

¹⁷ IPG (2008): *Tyre testing data and factsheet*.

¹⁸ Kropp, Kihlman et al (ibid), p.29

¹⁹ DG Enterprise, Impact assessment study

²⁰ FEHRL (2006): Study SI2.408210 *Tyre/Road Noise Report* and *Annexes*; VTI (2008): *Consumer label for tyres in Europe. IPG (2008): Tyre testing data*.

²¹ HARMONOISE project: <http://www.harmonoise.org/>

²² Kropp, Kihlman et al (ibid), p.7

²³ TNO (2008): *A brief cost-benefit analysis of tighter limits in the Tyre Noise Directive*

²⁴ Kropp, Kihlman et al (ibid), p.21; IPG (2006): *Cost-effectiveness of source measures to reduce traffic noise*

²⁵ TNO (2008): *A brief cost-benefit analysis of tighter limits in the Tyre Noise Directive*

Also see: TNO (2008): *Comment on TUV Sud Tyre tests 2008*