



Urgent need
to reduce
rail noise

- **Rail noise abatement - addressing the existing fleet**

Noise is one of the most widespread public health threats in industrialised countries. The abatement of noise is necessary not only for reasons of comfort but also because of other important health effects such as cardiovascular problems and cognitive impairment.

Rail transport is generally considered one of the most environmentally friendly transport modes. However, the contribution of rail transport to noise pollution can be substantial. According to European Environment Agency figures for 2000, about 10% of the population in the EU-15 was exposed to significant noise from rail transport.

In some European regions there is substantial public opposition to rail noise and a growing demand for political initiatives to reduce it. If no remedial action is taken, this could lead to restrictions in rail freight traffic along the most important European rail corridors. A possible modal shift from rail to road on these corridors would lead to increasing environmental impacts, in particular greenhouse gas emissions as the specific CO₂-emissions of rail freight are significantly lower than those of road haulage.

Photo: courtesy of SNCF CAV

● New Community action on rail noise

● The objectives

In order to significantly reduce noise emitted by freight trains Community action aims at retrofitting about 370 000 wagons in Europe with low-noise brakes. All wagons running more than 10 000 km per year and with a remaining lifetime of at least 5 years should be equipped with this technology by 2014.

● The approach: A combination of instruments to promote retrofitting

To overcome the existing obstacles to retrofitting, the European Commission analysed different measures and concluded that combinations of policy instruments are more suitable and effective than individual measures. The Commission proposes a set of the following measures:

- Noise-differentiated track access charges: Railway undertakings have to pay fewer charges if they use silent wagons instead of noisy ones. This charge differentiation gives strong economic incentives to retrofit existing wagons;
- Noise emission ceilings set limits for the daily average emissions at a certain location along the line. They could prevent increasing noise if rail freight transport grows after all wagons have been retrofitted;
- Voluntary commitments which can support retrofitting and the introduction of noise-differentiated track access charges.

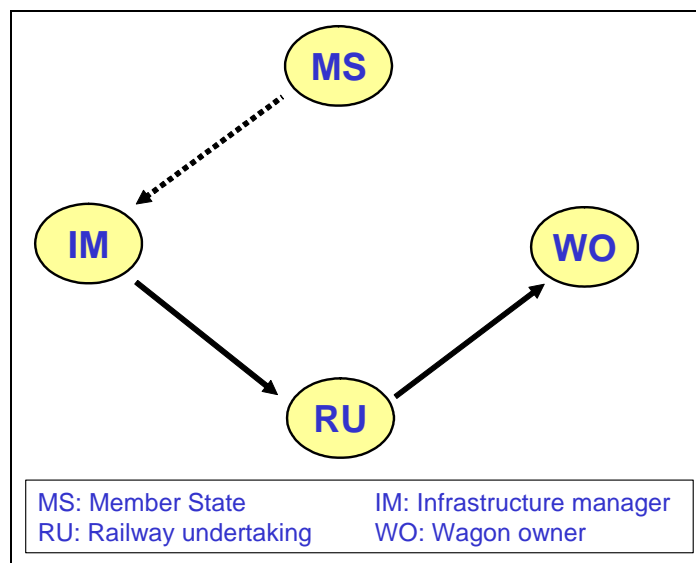
In the course of the revision of Directive 2001/14/EC, the Commission will propose by the end of 2008 a mandatory and harmonised introduction of noise-differentiated track access charges. To speed up retrofitting, the Commission recommends Member States and rail infrastructure managers to introduce differentiated track access charges at a voluntary basis prior to the entry into force of legal obligations that cannot be expected before 2012.

With this approach, retrofitting of the major part of the European freight wagon fleet should be possible by the end of 2014. The perceived level of noise emissions of freight trains will be reduced by about 50%.

The main benefits of this set of measures are noise reduction (with a cost/benefit ratio of up to 10), costs lower than those of other instruments such as direct subsidies, and its possible wide application to all wagons registered in different EU Member States or even in countries outside the EU. The market-based instrument of differentiated track access charges also provides incentives to give priority to highly used wagons.

● Introduction of noise-differentiated track access charges

Today, railway undertakings pay a charge for the use of rail infrastructure. This charge could be differentiated according to the noise emissions in order to provide financial incentives for the use of silent wagons and therefore for retrofitting the existing fleet. The initial investment for retrofitting could be compensated by lower charges:



At European level, Directive 2001/14/EC¹ harmonises charging principles. One of these principles is that infrastructure charges may take account of the cost of the environmental impact of train operations, including noise. Any charge differentiation should in principle reflect the magnitude of the impact on the environment. Today three basic models of differentiated track access charges could be used as an incentive:

- a cost-neutral *bonus-malus* system with reduced charges for silent wagons and higher charges for noisy ones;
- a *bonus* system consisting of reduced charges for silent wagons where the infrastructure manager receives financial compensation from the Member State;
- a *malus* system consisting of increased charges for noisy wagons.

As Directive 2001/14/EC does not allow an increase in overall revenue (unless there are similar charges for competing modes of transport), a *malus* system will be feasible only when a comparable charge is applied for road freight transport. The proposed Eurovignette Directive² will introduce an external cost charge for road freight transport and therefore make it possible to modulate track access charges more widely.

¹ Directive 2001/14/EC on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification, OJ L 75, 15.3.2001, p. 29.

² Proposal for a Directive amending Directive 1999/62/EC on the charging of heavy goods vehicles for the use of certain infrastructures.

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A *bonus* system would provide the necessary economic incentives for the wagon owners to retrofit their wagons in the start up phase. After the start-up phase, there will be no further need for a *bonus* system. Instead, a cost-neutral *bonus-malus* system could provide incentives to pursue retrofitting programmes and stimulate the introduction of more innovative low-noise technologies at a later stage.

● Other measures

As complementing instrument, the European Commission recommends to introduce noise emission ceilings for major rail freight lines as a second step after the initial retrofitting programmes have been completed. The noise emission ceiling limits daily average emissions at a certain location along the line. For example, current noise emission could be taken as a limit to prevent increasing noise if rail freight transport grows.

Clearly, the technology available today cannot be regarded as sufficient for retrofitting on a European scale. The Commission therefore urges industry to further develop composite brake blocks in close cooperation with railway undertakings and wagon owners in order to reduce costs significantly. The review of the current authorisation procedures for composite brake blocks by the Commission will also lead to reduced retrofitting costs.

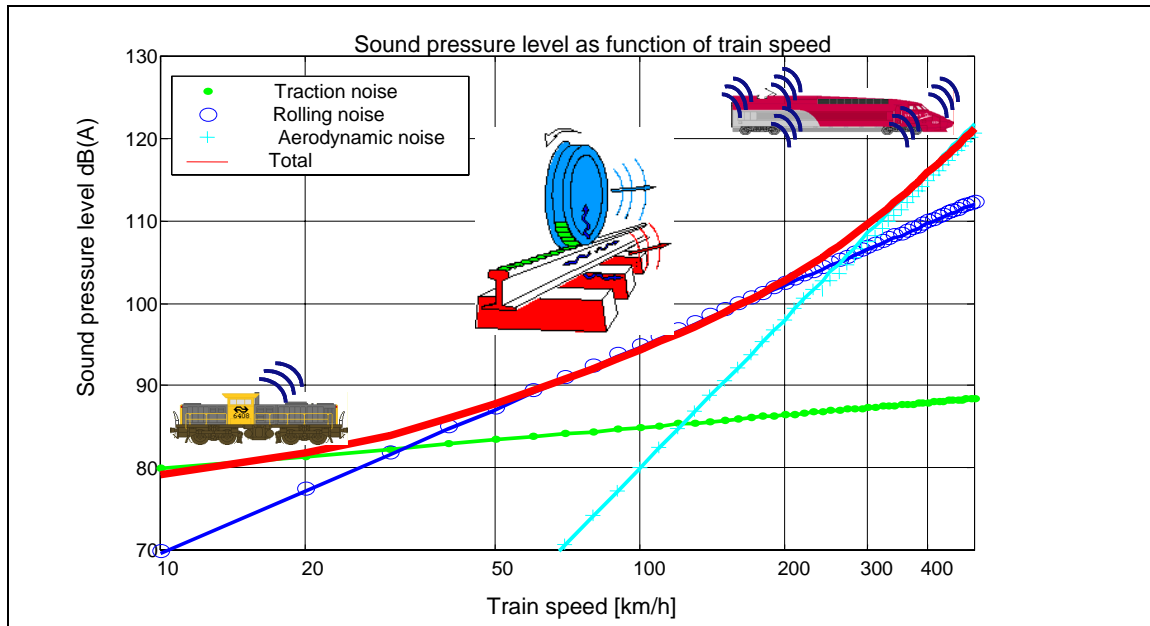
● Background

● Freight wagons and their braking technology as most important source of rail noise

According to experts³, rolling noise of freight is the most important source of rail noise, even more than traction or aerodynamic noise. Freight trains usually run at speeds in the order of 50 - 100 km/h where rolling noise is the predominate source. The braking technology used nowadays (cast iron brake blocks braking on the wheels' surface) leads to rough wheel surfaces and subsequently to a high level of vibration of rails and wheels. As freight trains often operate at night, their noise emission is even more critical.

³ WG Railway Noise of the European Commission: Position Paper on the European strategies and priorities for railway noise abatement, <http://ec.europa.eu/transport/rail/ws/doc/position-paper.pdf>.

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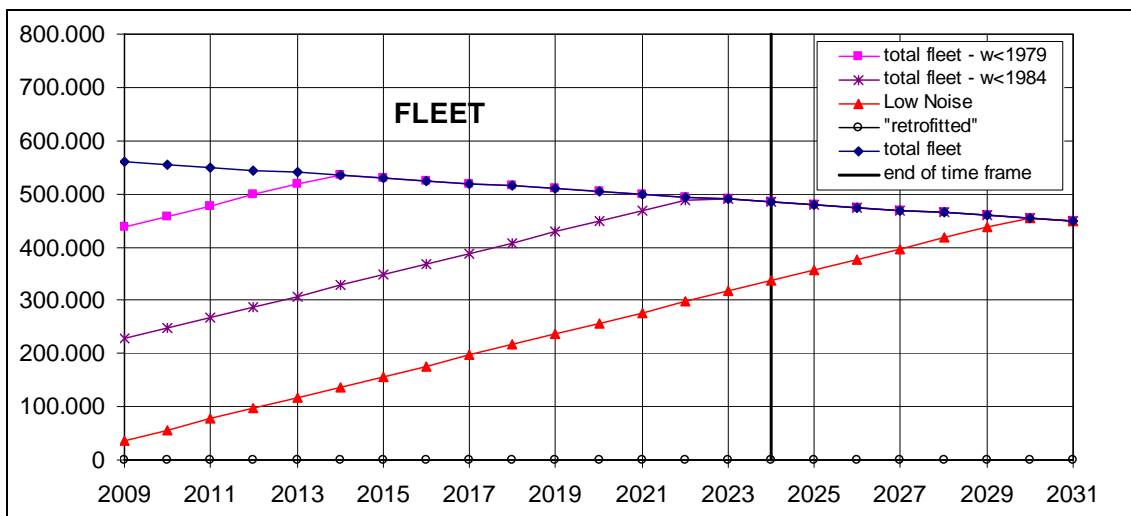


Source: Position Paper of the Working Group Railway Noise of the European Commission

● **Noise emission limits – need for further action**

In December 2005, the Commission adopted technical specifications for interoperability relating to the subsystem "rolling stock – noise" (Noise TSI). These specifications introduced the first noise limits for rolling stock used in the European Union. Limits apply to new and renewed rolling stock including freight wagons. New freight wagons have to be equipped with low-noise brake blocks reducing the perceived noise emission by about 50%.

However, the introduction of this low-noise technology will take several years due to the long lifetime of rolling stock. Without additional measures, it will not be before 2020 that half of the freight wagon fleet will become more silent.



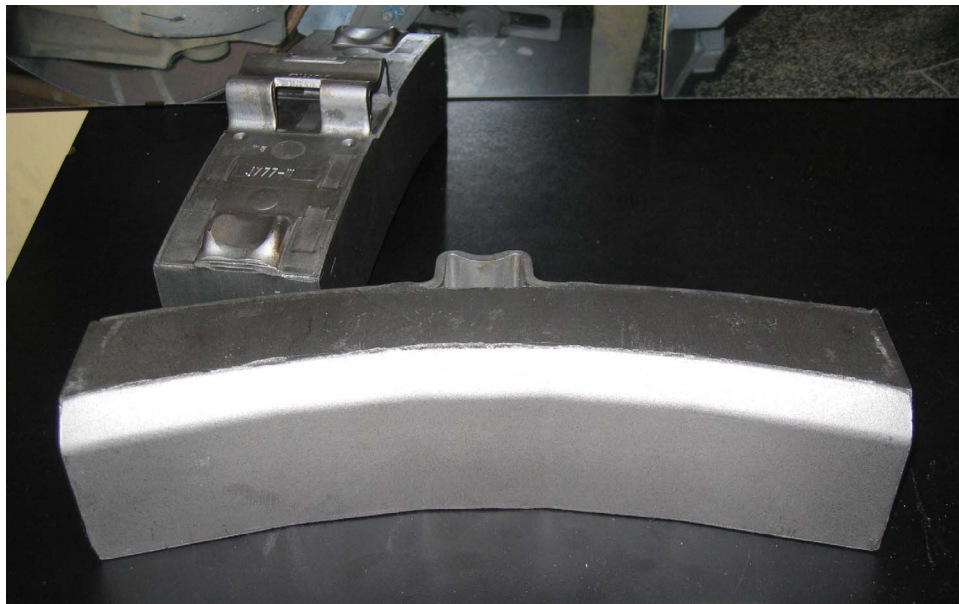
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The effective reduction of noise emissions will be even slower due to the nature of noise perception⁴. Half of the expected average reduction of 8 decibels (dB) following the renewal of the fleet with low-noise wagons will only be achieved by 2025. Therefore, additional measures addressing the existing fleet are required. Retrofitting these wagons with low-noise braking technology is therefore the best way to speed up the noise reduction significantly.

- **Low-noise technology to be used**

The technology is now available to reduce rail noise significantly at its source. Several types of low-noise brake blocks have been developed by industry, tested and homologated by UIC, the international union of railways (K-blocks in 2003) or provisionally homologated (LL-blocks in 2005). K-blocks are very effective in noise abatement (reduction of up to 10 dB) and are in general regarded as cost neutral for new vehicles. However, as they have different braking characteristics compared to the conventional cast iron blocks, retrofitting requires adjustments in the braking system, leading to additional initial costs in the range of EUR 3000 to 12000.

LL-blocks are currently developed to be better suited to retrofitting because they do not require such adjustments. However, due to technical problems or missing practical experience they have not yet received the definitive homologation.



More information on rail noise policy for Europe:

http://ec.europa.eu/transport/rail/environment/noise_en.htm

⁴ For the measurement of noise, the logarithmic decibel scale (dB) is used. An increase/ decrease of 10 dB is generally perceived as "twice as loud" respectively "half as loud".