



Position Paper

EU legislation on road traffic noise

INTRODUCTION

The entire automotive industry in Europe - including the tyre industry as a major supply sector - is facing a deep structural transformation, driven by the mega trends of digitalisation, automation, new drive technologies, as well as sustainability and climate protection measures. All these factors will demand significant adaptation to secure the mobility of the future. The European Automobile Manufacturers' Association (ACEA), the European Tyre and Rubber Manufacturers' Association (ETRMA) and the European Tyre and Rim Technical Organisation (ETRTO) all subscribe the European objective of a sustainable transformation of the economy, whilst overcoming the economic effects of the coronavirus pandemic. In so doing, we also support the objectives of the European Green Deal. However, the goal of environmentally friendly and competitive transport cannot be achieved by the automotive sector alone; accompanying measures in economic and transport policy are urgently needed.

The availability of mobility for people and goods is one of the cornerstones of modern life. Affluence, growth and technological developments lead to a greater need for mobility, with new mobility options playing an important role¹. Mobility is one of the key factors in determining whether people can achieve their professional and personal goals². Furthermore, the circulation of goods is a decisive factor in a functioning economy.

However, mobility also creates conflicting objectives which require compromises to be found. In order to balance these conflicting objectives in the best interest of society, the legislator is continuously developing new requirements for road vehicles. Aspects such as safety, air quality control, sustainability and noise abatement underpin more stringent laws, which must be implemented in their entirety in products.

Integrating all these requirements from the various disciplines outlined above into a product poses major challenges for automotive manufacturers and suppliers. One of the problems in balancing conflicting objectives lies in the fact that people play a number of roles when it comes to traffic. When in their role as the driver of a road vehicle for instance, different aspects are more important to them than when in their role as pedestrian.

ENVIRONMENTAL NOISE

Environmental noise policy has been given importance by the European Commission's initiative to update the regulatory framework of vehicle sound emissions. Road traffic noise has many facets. The World Health Organization (WHO) has been investigating the effects of latent noise exposure on health for many years, and issues recommendations on noise exposure targets. The EU is addressing this type of environmental noise burden through its Environmental Noise Directive³, and requires member states to assess noise levels in agglomerations and along major transport routes, and to draw up noise management action plans on the basis of this information. These noise maps reflect noise abatement measures taken by communities, such as reduced speed limits on streets, improved road surfaces and noise barriers. While most policy plans suggest that noise should be reduced at source, primarily by reducing the sound emission of vehicles, the progress of technology is an unmonitored part of that EU noise mapping. We suggest that progress in technology for

¹ <https://www.plattform-zukunft-mobilitaet.de/?lang=en>

² <https://www.adac.de/-/media/pdf/dko/adac-studie-evolution-der-mobilitaet-englisch.pdf>

³ [European Directive 2002/49/EC](#)

powertrains and tyres be adequately incorporated into the noise-mapping calculations and reviewed periodically.

However, the public perception of this type of road traffic noise is less important than other environmental issues⁴. With regard to noise, the public focusses more on noise caused by single incidents, eg from motorcycles⁵ or horns, or by reckless driving behaviour⁶.

VEHICLE SOUND EMISSION

The forthcoming revision of the vehicle sound emission legislation will have to tackle both aspects: noise nuisance (single incidents) and noise pollution (latent noise exposure). Current vehicle noise legislation already reflects both aspects. Vehicles are measured for type approval in a way that the determined sound level is representative of the use of the vehicle in urban driving conditions. The type approval sound level of a vehicle is representative of 90% of all driving conditions in urban traffic. Furthermore, extended requirements apply especially to passenger cars over a wide operating range in order to exclude inappropriate emissions of noise.

Vehicles have a particular sound emission that cannot and should not be completely eliminated. Indeed, 'zero noise emission' is not desirable for vulnerable road users (pedestrians, cyclists, etc) for safety reasons. This dichotomy is taken into consideration by the noise legislation, which not only prescribes maximum levels for environmental protection, but in the EU - since July 2021 onwards - stipulates minimum sound levels for vehicles that operate in pure electric mode, in order to ensure that they can be adequately detected when in motion. Therefore, any intended updates to the sound emission legislation must not lose sight of the fact that lowering maximum thresholds will mean an increasing number of products become subject to provisions for minimum noise levels, and will therefore need to be fitted with additional sound generators⁷.

ROAD TRAFFIC NOISE

Road traffic noise is caused by a combination of elements, in particular rolling noise (interactions between the tyre and road surface) and propulsion noise (originating from the engine and drive train). For lower speeds, propulsion noise dominates, while for higher speeds tyre rolling sound dominates. There is a transition between 30 km/h to 50 km/h, depending on the traffic situation (vehicle operation conditions) and the road surface quality.

For road traffic noise, the type of road surface plays a major role: the type of material and surface texture have a major influence on the tyre-rolling sound created by tyres of a vehicle. A low tyre-rolling sound can only be achieved when all technologies to minimise noise are applied to the road surface in the same manner as for tyre technologies. Different and partly contradictory aspects need to be considered for both the road surface and tyres.

The main role of a tyre is to hold the vehicle safely on the road: braking distance, longitudinal and cornering stability, dry and wet adhesion are only few of the criteria that every driver is familiar with from their own experience. In addition, low rolling resistance is a key regulated

⁴ European Commission, Eurobarometer 468, 2017.

⁵ Bundesratssache (Bundesrat report) 125/20 on noise pollution from motorcycles.

⁶ <https://www.mannheim24.de/mannheim/mannheim-innenstadt-einsatzgruppe-poser-polizei-wird-aufgeloeset-bilanz-jahres-2018-10294297.html>.

⁷ https://en.wikipedia.org/wiki/Electric_vehicle_warning_sounds.

performance, as it optimises fuel consumption and a prolongs the wear life of tyres (an important demand of customers). Tyres can be optimised for a limited number of particular performance parameters, but recent studies show that it is not possible to optimise them for all parameters simultaneously. The requested progress towards quieter tyres will inevitably jeopardise other parameters, such as driving safety and eco-friendliness. Any further tightening of noise regulations will have far-reaching consequences and could even endanger road safety and/or zero-carbon objectives.

Road construction has developed interesting new technologies in recent years to create 'low-noise' road surfaces. These are particularly well suited to an urban environment, because they are exceptionally quiet, offering good grip and a long service life.⁸

BUILDING TECHNOLOGY

In building technology, the latest noise-absorbing facades and an update of the Energy Efficiency Directive (EED) have also delivered new window technologies and ventilation concepts.⁹ Both can help to deliver a marked improvement in noise exposure abatement on roads with heavy traffic. Today we can already benefit from synergy effects in other areas. When planning for a future with green and smart cities, these aspects must be included when forecasting noise control requirements.

RECOMMENDATIONS

ACTIONS FOR NOISE ABATEMENT

We are calling for:

- The systematic use of low-noise road surfaces, particularly in noise hotspots;
- A stronger focus on the potential for noise abatement when planning traffic flows;
- The use of all types of new technologies to minimise noise propagation in urban environments;
- A reduction in single-event noise peaks, including a consistent control of illegal modifications of vehicles and/or their components, and of antisocial driving behaviour.

⁸ [COLAS Nanosoft road surfacing.](#)

⁹ "The additional cost of the various soundproofing classes for windows tends to be low. That is why acoustic windows are normally worth the money due to their thermal insulation alone." See: <https://www.fensterversand.com/schallschutzfenster.php>

ACTIONS FOR IMPROVED ASSESSMENT AND VALIDATION OF ENVIRONMENTAL NOISE

- Measures that reduce environmental noise should be reflected in environmental noise assessment tools (noise mapping). This includes progress in technology at the source¹⁰.
- The accuracy of noise measurement should be recognised as a tool to better enforce regulatory provisions.

CONCLUSION

Automobile manufacturers and their suppliers take their responsibility in building a future-orientated society seriously. Support from other stakeholders, particularly policy makers, is also needed to maximise the potential of quiet vehicles in everyday road traffic, and to make the progress in noise abatement perceivable to European citizens.

¹⁰ ETRMA report "[Tyre & Road Traffic noise. Where we should look for road traffic noise improvements](https://www.etrma.org/key-topics/tyre-regulations)", December 2021; <https://www.etrma.org/key-topics/tyre-regulations>