

April 2012

Briefing

New EU vehicle noise limits

Context

Traffic noise is the most widespread environmental problem in the European Union harming the health of more than one in three EU citizens.ⁱ Road noise imposes disproportionate costs on public authorities and society compared to the modest costs of controlling noise directly from the vehicle. Despite this, noise standards for road vehicles have not been updated for 20 years.

On 9 December 2011, the Commission published a proposal for a Regulation on the sound levels of motor vehicles. The proposal, if adopted by the Parliament and the Council, will replace the existing Vehicle Noise directive (70/157/EEC). With the adoption of the new law, slightly tighter noise emission limits for cars, vans, lorries and buses will be adopted and noise testing method will be updated.

The proposal is currently being considered in the European Parliament by the Environment Public Health and Food Safety committee (ENVI) with opinions being provided by the committees on Transport and Tourism (TRAN) and Internal Market and Consumer Protection (IMCO). It will also be considered by Ministers under the Competitiveness Council later in 2012.

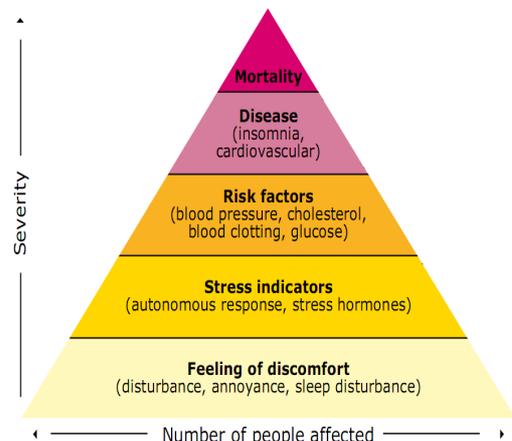
This paper outlines the case for effective controls on vehicle noise and makes specific recommendations to strengthen the Commission proposal.

Road traffic noise harms the health of 1 in 3 EU citizensⁱⁱ

Road traffic noise is the most widespread cause of environmental health problems in Europe. Some 210 million people, over 44% of the EU population, are regularly exposed to road noise over 55 decibels ($L_{den} 55dB(A)$ ⁱⁱⁱ), the level recognized to pose a serious risk to health by the World Health Organisation (WHO).^{iv}

People disturbed by traffic noise have increased levels of stress hormones that raise their blood pressure and other risk factors leading to disease and death, as shown in Figure 1. Fifty thousand deaths, a quarter of a million cases of cardio vascular disease and 5% of strokes^v are estimated to be caused by traffic noise. In terms of environmental burden on health, traffic noise is second only to air pollution according to the WHO.

Figure 1: WHO Pyramid of Health Effects of Noise



Traffic noise is also shown to reduce performance at work and to hinder children's learning.^{vi} Road noise reduces the quality of life of hundreds of millions of EU citizens, is a principal cause of annoyance for urban residents and one of the most common constituent complaints to politicians.

A five step plan to cut traffic noise will deliver substantial health benefits and save money

The European Commission's proposal^{vii} would reduce the noise level for cars and vans by 4 decibels and for lorries and buses noise by 3 decibels in two steps from 2014 and 2017 (if the regulation is adopted in 2012). It will also introduce a new noise test that is more representative of real world traffic noise. The proposal is estimated to achieve a 25% reduction in the number of highly annoyed people. But overall road noise would not fall in proportion to the cuts in the limits and the reduction will still be inadequate to protect health.

Initially the new standards will only apply to entirely new types of vehicles, so not require any changes at all to current models. The Commission proposal would only restrict the sale of non-compliant noisy vehicles after 2019. Progress would be painfully slow; benefits would only be fully realised after 2030.

Transport & Environment, the European Environmental Bureau and the Health and Environment Alliance have identified a five step plan to strengthen the Commission's proposal:

1. Bring forward the benefits of the new law by accelerating the introduction of the revised standards, with Step 1 to be enforced in 2013 and Step 2 in 2015;
2. Set out a pathway for further noise reductions, by introducing Step 3 standards in 2020 which are 2 decibels lower for all vehicle classes (compared to Step 2 limits);
3. Ensure testing is representative of real world noise emissions, such as by adjusting limit values for trucks by -1 decibel to account for ultra-quiet tyres used in the test but never used on the road;
4. Require noise information to be available and clearly displayed at points of sale and in promotional material for vehicles and public access to all test data for full transparency;
5. Introduce stricter limits for highly intrusive peak noise levels at 90 decibels, such as when an engine is revved.

Improved standards are long overdue - vehicle noise can be quickly and cheaply reduced

Most urban traffic noise originates from the vehicle rather than the tyres. European vehicle noise standards to date have had little impact on noise levels adjacent to roads. Despite this, vehicle noise standards for have not been updated for 20 years.

Cutting road noise levels by just 3 decibels is equivalent to halving the level of traffic and can be quickly and cheaply achieved with currently available technologies. The European Commission proposal is lacking ambition: Nearly 1 in 4 cars and 1 in 3 light trucks tested over the past 5 years *already* meet the strictest Step 2 standards proposed.

The costs of reducing car noise are also small, at €20 per car per decibel reduction.^{viii} There are synergies between technologies to reduce CO₂ emissions and noise, such as improved aerodynamics, controlled engine speeds, stop-start technologies and hybrids.

The noise standards for heavy trucks are particularly important, as trucks already cause half of the road noise burden across Europe and are a fast-growing share of the fleet. Noise-reducing measures like engine encapsulation were widely used in the 1990's to cut noise and could be reintroduced. The additional costs of noise abatement technologies for trucks and buses are projected to be €250 per vehicle per decibel reduction, which would be passed to the consumer in a 1% increase in the purchase price for Step 2, or 1.5% price increase for Step 3.^{ix}

The benefits of cutting noise outweigh the costs by more than 30 times

Reducing traffic noise will bring enormous benefits and cost savings. Independent consultants TNO, who undertook the analysis underpinning the Commission proposal, have re-examined the costs and benefits of vehicle noise standards using the latest information and undertaken an impact assessment for a further Step 3 to take effect in 2020.^{ix}

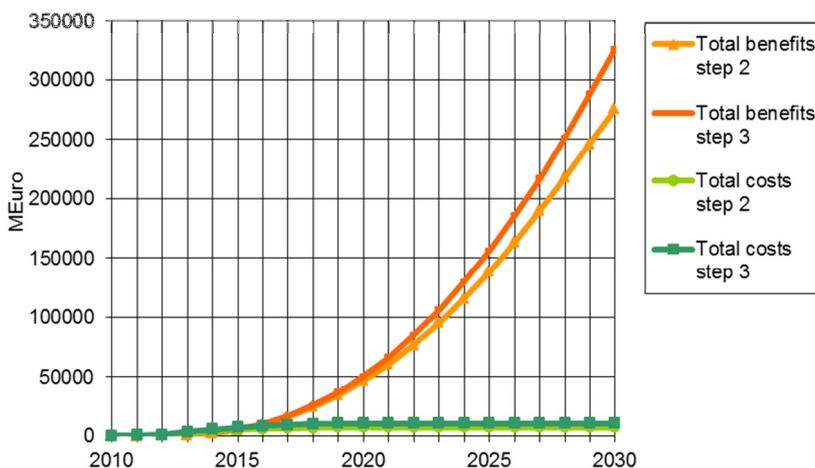
By adopting the proposed Step 3 limit values, 2 decibel below Step 2 in all vehicles classes, the number of people “highly annoyed” by traffic noise will be reduced by 39%. In addition, 8 million fewer people will be “highly sleep disturbed”, a 29% reduction. The cumulative benefits (health, amenity and abatement savings) over 20 years amount to €326 billion, which is equivalent to increasing EU GDP by 0.1%.^{ix}

The health benefits of significantly cutting the number of people exposed to high road noise levels will contribute €89 billion of the accumulated savings to 2030 from the proposed Step 3 limit value. In addition, increased property prices in quieter areas illustrate the value that people attach to avoiding traffic noise; this benefit is valued at €229 billion for Step 3.

Tackling noise at source from the vehicles also reduces the need for national governments, local authorities and homeowners to install costly noise barriers or sound insulation to homes and public buildings. The Step 3 standards for 2020 would also halve the need for noise barriers and reduce the need for noise insulation by a quarter in the long-term, saving €8 billion in public expenditure.

The benefit of stringent noise limits for vehicles outweigh the costs by a factor of over thirty to one^x.

Figure 2: Accumulated costs and benefits for Step 2 and Step 3 limits



Using new information to undertake an updated cost-benefit analysis (according to the European Commission methods), see figure 2, clearly shows the overwhelming case for tighter noise limits:

For Step 2, benefits of €275 billion far outweigh the costs of €7 billion, a benefit-cost ratio of 39:1.

For Step 3, benefits of €326 billion compare to costs of €10 billion, a benefit-cost ratio of 32:1.

Ensuring that clear information on noise emissions of each vehicle is available to public authorities and fleets, especially public transport companies and haulage fleets, will empower them to set appropriate incentives to encourage the uptake of quieter vehicles. For example, public authorities could set procurement standards for bus fleets, allow only the quietest delivery vehicles preferential access to certain sensitive areas or times of day, reduce road user charges for quieter vehicles or give fiscal incentives. This could also allow vehicle owners to recoup any small increase in the purchase price.

The road to ruin

The motor industry continues to present a range of misleading and distorted evidence in its attempt to prolong 40 years of failed noise regulation of vehicles beyond half a century. Specifically:

1. The industry argues that there are multiple sources of environmental noise – whilst omitting that the number of people exposed to road noise is at least 5 times greater than all other sources (railways, airports, and industry) put together.^{xi}
2. An independent analysis^{ix} of proposals put forward by The European Automobile Manufacturers' Association (ACEA), the Japan Automobile Standards Internationalization Center (JASIC) and the German Ministry of Transport shows that their proposed limit values together with reclassifications of vehicle classes actually lead to much weaker and ineffective standards, as shown in Table 1. Any consideration of reclassification of vehicles must ensure the stringency of the Commission proposal is not diluted.

Table 1: Comparison of the stringency of alternative proposals for vehicle classifications

Vehicle category	Step 1			Step 2		
	German vs. EC	ACEA vs. EC	JASIC vs. EC	German vs. EC	ACEA vs. EC	JASIC vs. EC
Cars (M1)	+ 2 / +4	+2 / +4	+2 / +4	+2 / +5	+2 / +5	+2 / +4
Medium Buses (M2)	-1 / +1	0 / +2	-1 / +2	-1 / +1	0 / +3	-1 / +2
Heavy Buses (M3)	+1 / +3	+1 / +3	+1 / +3	+1 / +3	+2 / +4	+1 / +3
Vans (N1)	+1 / +2	+1 / +2	+1 / +3	+1 / +2	+1 / +2	+1 / +3
Light trucks (N2)	+1 / +3	+1 / +3	+2 / +4	+2 / +3	+2 / +4	+2 / +4
Heavy trucks (N3)	+1 / +4	+1 / +2	0 / +3	+1 / +4	+2 / +3	0 / +3
Average	+1,7	+1,8	+1,9	+2,0	+2,5	+2,0

3. The industry proposed limits for Step 1 are no step at all! Instead they represent a standstill period during which only the test method changes. The new test method has already been in place (parallel testing) since 2007. This proposal is purely to delay the introduction of tighter limits.
4. The motor industry suggests that an “integrated approach” is needed to reduce vehicle noise and far more should be done through quiet road surfaces, home insulation and noise barriers. Whilst in areas with very high traffic volumes these are complementary options, they are much less cost-effective than taking action on the vehicles. The average cost of protecting one person from noise annoyance is between 8 and 120 times greater for noise walls, insulation and quiet surfaces, compared to making vehicles quieter.^{xii} Or put another way, 100 times more people can be protected from road noise if the same amount of money is spent on developing and producing quieter vehicles instead of on noise barriers.
5. The industry also focusses on tyres as the main noise source whilst failing to differentiate between different types of road and traffic situations. Whilst tyre noise is dominant in free-flowing traffic, such as on highways, it is overall vehicle (axle, engine, exhaust and tyres) noise that is most relevant in urban centres. We believe the current focus on vehicle noise is correct but also urge the Commission to examine new proposals to further reduce tyre noise later in 2012.

Stricter vehicle noise standards are so cost-effective that 100 times more people can be protected from road noise for every € spent on developing and producing quieter vehicles instead of on noise barriers or sound insulation.

The amendments proposed by the motor industry, if adopted, would significantly weaken and needlessly delay the already inadequate proposals of the Commission. Importantly, by blocking the most cost-effective solution the weaker proposals, if adopted, would oblige cash-strapped public authorities and cities to spend more on expensive abatement measures. The European Parliament has called for noise to be cut in the Sixth Environmental Action Programme and the Ambient Noise Directive – the proposed vehicle noise regulation provides a significant opportunity to improve health and quality of life.^{xiii}

The way to a quieter life

There are several key areas in which the Commission proposal needs to be strengthened to increase the benefits and accelerate the introduction of quieter vehicles:

1. The introduction of the Step 1 and 2 standards needs to be brought forward to 2013 and 2015 respectively;
2. The thresholds for the classes of buses and some trucks and vans should be amended – but not allowing any weakening of the stringency of the limit values proposed by the Commission;
3. Step 3 limit values should be introduced in 2020 (8 years after the proposed introduction of the regulation) to provide a pathway to safer traffic noise levels. This provides industry with regulatory certainty and a long lead time to achieve the necessary reductions;
4. Limit values for heavy trucks need to be reduced by 1 decibel to account for the unrepresentative, ultra-quiet tyres used in testing but not on the road. This will better ensure that the test results and limit values require real world noise reductions. **Proposed amendments to limit values, vehicle classifications and compliance dates are summarised in Table 2 below;**
5. An absolute not-to-exceed limit of 90 decibels under any driving conditions must be added to the ‘additional sound emissions provision’ (ASEP) to protect the public.^{xiv} This is needed to ensure these vehicles do not create disturbing and damaging levels of extreme noise. The ASEP as currently proposed would legalise high powered vehicles to produce extreme noise over 100 decibels - such as during hard acceleration. A not-to-exceed limit will be easy to measure and straightforward for public authorities to check and enforce;
6. Vehicles must be tested on a test surface which is representative of real world conditions. This can be achieved by ensuring Annex VII of the Commission proposal specifies the test track complies with the current norm (ISO 10844:2011);
7. To speed up the use of quieter vehicles in the future, national and local authorities, as well as public transport and commercial fleets, should have full access to information about noise levels from different vehicles. Full transparency and public availability of the test results is vital as the basis for incentives such as procurement standards for quieter vehicles, preferential access to certain urban zones or delivery times, or financial and fiscal incentives, such as lower road user charges or taxes. Provisions are needed to ensure noise information about each vehicle is available at all points of sale and in promotional materials.

Table 2: Proposed noise emission limit values and vehicle classification

Vehicle category	Vehicle sub-category	Limit values expressed in dB(A) [decibels(A)]					
		Step 1		Step 2		Step 3	
		Valid 1 years after publication for new type approvals (2013)		Valid 3 years after publication for new type approvals; 5 years for all vehicle sales* (2015-2017)		Valid 8 years after publication for new type approvals; 10 years for all vehicle sales* (2020-2022)	
		General	Off-road **)	General	Off-road **)	General	Off-road **)
M	Vehicles used for the carriage of passengers						
M1	no of seats ≤ 9; power-to-mass ratio ≤ 150 kW/ton	70	71***)	68	69***)	66	67***)
	no of seats ≤ 9; power-to-mass ratio > 150 kW/ton	71	71	69	69	67	67
M2	no of seats > 9; maximum mass ≤ 2,5 tons	72	73	70	71	68	69
	no of seats > 9; 2,5 tons < max. mass ≤ 3,5 tons	73	74	71	72	69	70
	no of seats > 9; 3,5 tons < max. mass ≤ 5 tons;	74	75	72	73	70	71
M3	no of seats > 9; maximum mass > 5 tons; rated engine power ≤ 250 kW	75	76	73	74	71	72
	no of seats > 9; maximum mass > 5 tons; rated engine power > 250 kW	77	79	75	77	73	75
N	Vehicles used for the carriage of goods						
N1	Maximum mass ≤ 2,5 tons	71	72***)	69	70***)	67	68***)
	2,5 tons < max. mass ≤ 3,5 tons	72	73	70	71	68	69
N2	3,5 tons < max. mass ≤ 12 tons; rated engine power ≤ 150 kW	75	76	73	74	71	72
	3,5 tons < max. mass ≤ 12 tons; rated engine power > 150 kW	77	79	75	77	73	75
N3****)	maximum mass > 12 tons; rated engine power ≤ 250 kW	77	78	75	76	73	74
	maximum mass > 12 tons; rated engine power > 250 kW	79	81	77	79	75	77

*)	Sales include registration, sale and entry into service of all new vehicles.
**)	Increased limit values are only valid if the vehicle complies with the relevant definition for off-road vehicles according to article A.4 of Annex II of EU Directive 2006/46/EC
***)	For M1 and N1 vehicles the increased limit values for off-road vehicles are only valid if the maximum authorised mass > 2 tons
****)	All limit values for N3 vehicles have been lowered by 1 dB(A) to take account of the change of the instructions for the use of tyres in test method B.
Yellow marking	The definition of the sub-categories has been modified compared to the Commission proposal
Orange marking	The limit values have been modified compared to the Commission proposal

www.transportenvironment.org/what-we-do/vehicle-noise

References

- ⁱ WHO (2011) press release and report available at <http://www.euro.who.int/en/what-we-publish/abstracts/burden-of-disease-from-environmental-noise.-quantification-of-healthy-life-years-lost-in-europe>
- ⁱⁱ CE Delft (2007) *Traffic noise reduction in Europe: Health effects, social costs and technical and policy options to reduce road and rail traffic noise*, den Boer, Schrotten, Delft, August 2007. Available from: http://www.transportenvironment.org/Publications/prepare_hand_out/495
- ⁱⁱⁱ Decibel levels referred to here are A-weighted (dB(A)) to denote adjustment to human hearing range. Lden denotes the average sound pressure over all days, evenings and nights during a given year. Noise during the evening and at night is weighted more heavily to reflect increased sensitivity.
- ^{iv} WHO (2011) *ibid*
- ^v Sørensen, M. et al. (2011) "Road traffic noise and stroke: a prospective cohort study", *European Heart Journal*, doi: 10.1093/eurheartj/ehq466 First published online: January 25, 2011.
- ^{vi} WHO (2011) *ibid*
- ^{vii} Proposal for a Regulation of the European Parliament and of the Council on the sound level of motor vehicles 2011/0409 (COD), Brussels, Belgium, December 2011 : <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0856:FIN:EN:PDF>
- ^{viii} TNO (2012) Reduction of vehicle noise emission – Technological potential and impacts
- ^{ix} TNO (2012) *ibid*
- ^x TNO (2012) Reduction of vehicle noise emission – Technological potential and impacts
- ^{xi} Table 1 Com (2011) 321 final "Report from the Commission to the European Parliament and the Council on the implementation of the Environmental Noise Directive in accordance with Article 11 of Directive 2002/49/EC", Brussels, Belgium, June 2011. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0321:FIN:EN:PDF>
- ^{xii} Conference of European Directors of Roads "Value for Money in Noise Abatement" Presented at the 55th GRB, 7th-9th February 2012 agenda item 3(b) <http://www.unece.org/fileadmin/DAM/trans/doc/2012/wp29grb/ECE-TRANS-WP29-GRB-55-inf07e.pdf>
- ^{xiii} EU 6th EAP, Decision No 1600/2002/EC and Environmental Noise Directive 2002/49/EC.
- ^{xiv} See also T&E (2009) Briefing : *How the motor industry hijacked the regulation of vehicle noise* <http://www.transportenvironment.org/publications/how-motor-industry-hijacked-regulation-vehicle-noise>