

Trends in road traffic noise criteria in European countries

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Japan's Environmental Quality Standards (EQS) for noise have remained largely unchanged since 1999. With road traffic noise compliance rates reaching 95.6%, the appropriateness of the current standards is being questioned. To contribute to discussions on future revisions, this study investigates trends in road traffic noise criteria in European countries.

The Environmental Noise Directive (END) and WHO Environmental Noise Guidelines form the basis of European noise policy. The END introduced harmonized indicators (L_{den} and L_{night}) for strategic noise mapping, while WHO recommends $L_{den} \leq 53$ dB and $L_{night} \leq 45$ dB for road traffic noise. A 2019 report by the European Network of the Heads of Environment Protection Agencies compiled criteria across European countries through a questionnaire survey, which forms the primary data source of this study.

Among the 27 countries surveyed, 24 had established criteria for road traffic noise. Table 1 shows criteria for representative countries. Most use L_{day} and L_{night} as primary indicators; some also specify $L_{evening}$ or L_{den} . L_{day} values of 55-60 dB and L_{night} values of 45-50 dB are most common, with L_{night} typically set approximately 10 dB below L_{day} . Eleven of 24 countries apply more lenient standards to existing roads than to newly constructed roads. Legal binding force is classified into three categories: Category I imposes strict obligations upon exceedance, Category II requires countermeasures but enforcement is limited, and Category III treats criteria as guidelines or target values. Only the Netherlands and Slovakia set criteria consistent with WHO recommendations.

The following aspects of European practice are relevant to Japan's EQS revision. Response to WHO guidelines: Most European countries set standards more lenient than WHO recommendations, reflecting the difficulty of health-based standard-setting in practice. However, Japan's current target value (70 dB) is considerably more lenient than criteria adopted in most European countries, and a review based on recent scientific evidence is warranted. Differentiation for new and existing roads: Applying stricter standards to new roads while allowing more lenient criteria for existing infrastructure is a pragmatic approach adopted in many European countries and may be applicable to Japan. Source-specific standards: Most European countries maintain separate noise regulations by source. Establishing dedicated standards for road traffic noise in Japan could facilitate more targeted policy.

This study surveyed road traffic noise criteria across 27 European countries. Common settings of L_{day} values of 55-60 dB and L_{night} values of 45-50 dB were identified, and many countries differentiate standards for new versus existing roads. These findings provide a useful reference for revising Japan's Environmental Quality Standards for noise.

Table 1 Road traffic noise criteria in European Countries (Immission values in residential areas)

Country name	Status		Criteria				Legal Binding Force 1*	Remarks
	New	Old	L_{day}	$L_{evening}$	L_{night}	L_{den}		
Austria	○		55		45		II	
		○	60		50			
Czech Republic	○		60		50		I	Revised in 2022; relaxation and simplification
		○	68		58			
Denmark	○					58	I	
Germany	○		59		49		I	Including significantly change
		○	64		54			Revised in 2020: 3 dB(A) stricter limit.
Ireland	○					60	II	
Italy	○		60		50		II	Buffer zones set by land use zone
		○	67		57			
Netherlands	○				45	70	I	Revised in 2024. Values in are regulatory values for new buildings. New roads: +5 dB to L_{night} . Target values are L_{night} : 40 dB, L_{den} : 53 dB in both cases.
Switzerland	○		55		45		II	Correction applied according to traffic volume
		○	60		50			

*1 I: Strict obligation; II: Countermeasures required (limited enforcement); III: Guideline/target value.