

PERSPECTIVES ON TRANSPORTATION NOISE POLICIES WORLDWIDE

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What is the CAETS NCTC?

CAETS is the International Council of Academies of Engineering and Technological Sciences. It is a consortium of 26 national academies (one per country) with 12 in the EU. The Japanese member academy is the Engineering Academy of Japan. In 2007 the CAETS Council – in a meeting in Tokyo - established its Noise Control Technology Committee (NCTC) with the mission to provide technology support for noise policymakers.

Introduction

International noise policies have been ineffective for many years. An Organisation for Economic Co-Operation and Development (OECD) report 20 years ago, *Fighting Noise in the 1990s*, illustrates this:

”More and more people in OECD countries are exposed to high and potentially harmful levels of noise, chiefly from growing road traffic. Although governments have adopted policy objectives at the national and international levels, little real progress to reduce exposure to noise has been made in recent years.”

The situation is no better today. Numerous reports have referred to this fact for years. No government has yet been able to effectively handle the issue of excessive environmental noise. Health impacts of traffic noise are second only to those of air pollution according to a recent WHO/E report, *Burden of Disease from Environmental Noise*. Severe non-auditory effects of traffic noise are principally to the cardio-vascular system (hypertension and heart attacks). This is described in the the above WHO report as well as in the WHO report *Night Noise Guidelines for Europe* from 2009. One recent Danish study also finds a relation between traffic noise and stroke. The threat to public health is real and is now, 20 years after the OECD report, well-documented. The effects are more severe than was known 20 years ago.

Policy concepts

It is important to distinguish between emissions and immissions and policies that are based on these concepts which both originate from Roman law. Emission is the sound radiated by a source and is essentially independent of the environment in which the source operates. Immission is a measure of the total sound that the sources together give rise to in the environment and depends on the number of sources in the vicinity, their locations and the topography – man-made or natural. The immission levels vary with the location relative to the sources. The units for both emission levels and immission levels are decibels.

Noise policies can be grouped into those dealing with emissions and those dealing with immissions. These two groups should be strongly coupled but currently are not. Emission levels are regulated by internationally-agreed-to-limits with little consideration of the health effects among the exposed citizens. The effects of noise on citizens are linked to the immission levels to which they are exposed. Immission levels normally have the form of guideline values – surprisingly similar in many countries. Actual immission levels are often far above guideline values but little action is taken even though the levels are unhealthy.

Given present emission levels of transportation noise sources, a healthy environment for all exposed citizens is not possible because most noise sources are too loud. No planning in the world – including quiet road surfaces and/or very high barriers such as those installed along arteries in Japan – can provide a healthy environment for all citizens.

There is a gap between allowed emissions and the possibility to assure the citizens a healthy environment. This gap is approximately 20 dB for all types of transportation vehicles/noise sources. Emission limits must be greatly reduced to ensure healthy urban noise climates.

Emission and immission policies must be effectively linked. The way the policies are linked today varies from country to country. In the U.S. there is no linkage; in the EU there is some linkage but it is different from Member State to Member State; and in Japan and Hong Kong there are examples of good linkage. But no country has a completely satisfactory system, and no country has a completely satisfactory acoustic environment.

In the U.S. there are no federal noise emission limits on automobiles. The UNECE limits are observed by the industry. The 50 states can impose their own emission limits on automobiles, but none have done so to date. Some states in the U.S. have erected noise barriers and/or installed lower-noise pavements.

In the European Union the Environmental Noise Directive recommends that the WHO immission guidelines be adopted by the individual Member States. The guideline values are exceeded at many locations in all the Member States and, in most cases, have resulted in only palliative measures being taken that do not reduce noise at the source.

In Japan the linkage between immission guidelines and reductions of noise emissions from dominant noise sources has been successful for the Shinkansen super-express train. Such a result could only happen in a culture in which consensus plays a major role as it does in the monoculture of Japan. But the Japanese model cannot be exported.

The Shinkansen super-express train is an excellent example of successful policy linkage. There are no emission regulations on railway vehicle noise, so JR noise control engineers use the immission guideline to set acceptable emission levels for the noise sources of the super-express trains. The immission guideline for Shinkansen is the same for the entire country.

A new approach and concerted action needed

The same problems described by the OECD in 1991 still exist. Emission and immission policies have failed. Effective international agreements on emission limits are needed. The countries concerned with citizens' health and quality of life should take collective action to close the gap. Candidate countries could include Japan, France, Germany, U.K., Netherlands, Norway, and Denmark. The gap for transportation noise sources is approximately 20 dB. A 5 dB reduction for many of these sources is available today, but the remaining 15 dB reduction must be achieved through the supported efforts of noise control engineers. For many sources the additional 15 dB cannot be achieved until the initial 5 dB reduction has been accomplished. Each dB reduction is valuable for the health.

Emission noise limits need to be driving the technology, not slowly following, which has been the case for decades. Other emissions such as exhaust gases from motor vehicles have been reduced drastically by driving the technology with strict exhaust emission limits. Why cannot noise be similarly controlled? Japan, please help us!

Concerted action is needed now. CAETS' objective is to assist policymakers in improving national and international policies to reduce the emissions of dominant noise sources. At this moment there are discussions within the EU and the UNECE on stricter noise limits for cars and trucks.

The CAETS' opinion is that improved policies can be achieved by providing independent information on the technological options and support to counteract lobbying from industry. What is needed are well-informed policymakers who can challenge the industry, set up stringent limits, and find market-driving tools.

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