

### **Theses formulated by the Workshop "Road Noise"**

1. The "Backing Board" Method based on the Statistical Pass-by Method is well suited for determining noise emission along urban roads. This measuring method yields reproducible results also in urban town planning situations of the most varied nature and should be adopted in the future especially for testing noise-abated urban road surfaces.
2. In Poland, the requirements of noise protection in particular and of the environment in general have almost reached the Western European level.
3. Due to the enormous demand for catching up since the coming down of the "Iron Curtain", there is the partial tendency in Eastern Europe to apply guidelines and laws that have newly been created or adapted on the basis of EU directives more stringently than in Western Europe, thus posing higher requirements.
4. Early involvement and a comprehensive exchange of ideas of communities / the citizens and their requirements with view of planning complex traffic facilities should become the "normal case".
5. The development and application of noise-mitigating road surfaces (in their planning, implementation, the know-how of building firms, maintenance) should be further intensified.
6. In buildings equipped with noise-protection windows, ventilation by way of opening the windows is not possible any more, since open windows will invalidate noise protection. This problem may be solved in existing buildings by subsequently installing decentralised ventilation devices with heat recovery.
7. Much more efficiency can be achieved in the assessment of road construction noise, if the responsible road (monitoring and maintenance) operator provides the road construction project with Internet-based instruments for that purpose. – This is where Germany can learn much from New Zealand.
8. Trucks that are operated at a sound level of below 60 db(A) according to the PIEK certification scheme can be used in night-time delivery – without disturbing night sleep.

### **Theses formulated by the Workshop "Railroad Noise"**

1. Retro-fitting the rolling stock is generally acknowledged to be the most efficient noise-reducing strategy. It is to be supported by means of effective incentives. There is doubtful whether noise related track access charges will be able to provide the proper incentive. Direct funding remains to be the best incentive. An example from the Netherlands shows that transport clients can provide to the rolling stock owners direct incentives.
2. A new study shows that noise of the nocturnal railroad freight trains affects the awakening behaviour; according to the study more than aircraft noise does. In this context it was recognised that the retro-fitting of freight rolling stock with low-noise technology contributes to the rail bonus (at night) in comparison with other means of transport might be safeguarded.
3. State-of-the-art Passenger Trains and High Speed Trains are so quiet that the installation and fitting in of newly planned lines does actually not pose a problem any more.
4. Proven technologies (light-weight, full mass-spring systems) exist for limiting vibrations and structure-borne noise. However, there is a lack of investigations permitting to define limit values. Missing reliable limit values result in risks and planning uncertainty for the railways.
5. Physics is universal: This holds also true for the technical solutions for the various noise-related issues, caused by railways. The introduction of noise mitigation solutions throughout Europe can be supported by standardising the approval procedures.
6. Europe has a lead in know-how on noise protection and mitigation; this provides chances to be utilised world-wide.
7. Railway noise is not exclusively a (Western) European problem. Contributions from Asia and regarding the USA show that there is pressure all around on implementing noise-mitigating measures. Technical solutions are comparable; however, the annoyance levels in the various countries and on the continents are not, at least not always.

### **Theses formulated by the Workshop "Aircraft Noise"**

1. Airports frequently represent commercial enterprises; all investments have to be funded by fees and revenues. In the end, the funding of noise-mitigation measures is borne by the users. This has a direct impact on ticket prices and, therefore, also on the economic attractiveness of the respective airport.
2. The exploitation of radar data for noise monitoring is well worth being preferred over the time-window method, for radar data is of significantly higher precision in allocating noise incidents to flight tracks.
3. If noise events cannot be allocated unambiguously, either manual assessment or acoustic control of the recorded noise is to be equally recommended.
4. Noise-protection measures, such as ventilation facilities, should first of all be implemented in schools and other protection-worthy facilities, for their long planning duration and complexity.
5. Early involvement of all parties concerned, such as teachers, school-students and parents on the one hand and (education) authorities, school operators and communities on the other, is of particular importance for accepting noise-mitigation measures anticipated for schools.
6. The German Act for Protection from Aircraft Noise and related regulations leaves open many questions, which, in their practical implementation, leads to considerable uncertainty on both sides – the side of the airports and authorities, and the side of those exposed.
7. Its implementation is handled differently in the German federal states. The German federation is to be urged to issue uniform guidelines to construe and apply across all Germany the 1<sup>st</sup> and 2<sup>nd</sup> Air-borne Noise Protection Regulations in particular.
8. Not only aircraft themselves are relevant for causing noise, but mainly all flight procedures applied. Thereby, approach procedures are of special relevance. In order to design them more efficiently and more environmentally friendly, co-operation is required between all parties concerned: aircraft manufacturers, airlines, airports, responsible authorities and industry.
9. As early as at the stage of making prognoses, particularly when forecasting the demand of night flights, the measuring scales that courts need to apply are to be borne in mind. Quality assurance can be appropriate in the single case.
10. Compact technologies may contribute considerably to improving noise mitigation and air quality. There is still need for research in that respect.

**Theses formulated by the Workshop "Vessel Noise/ Vessel Acoustics"**

1. SEA Analysis should be further developed and used for noise prediction in ships.
2. Application of SEA has to be accelerated to be adapted to the design process of ships.
3. SEA should be used to generate more objective empirical predictions applicable in early design stages (condensed SEA).
4. Shipyards should put more emphasis on getting valid material data and acoustic data of equipment from sub-suppliers (e.g. spring elements in general, damping material, insulation).
5. Acoustic aspects have to be part of the entire design and construction process of the ship – much more than they do today.
6. New technologies (e.g. panel silencers) may be a good addition to the acoustic tool box.
7. In mega yachts new design elements (e.g. large windows in quiet rooms) create higher requirements of acoustic treatment and demand new solutions.
8. Acoustic requirements of high quality ships (yachts, naval vessels, research vessels) are similar to some extent and require almost the same design and management instruments.
9. Acoustic requirements of yachts are still increasing (no tonals, lower noise levels at even higher speeds, requirements of dynamic positioning operation).
10. Such a conference provides the platform for the exchange of information and practical interaction among both experts and decision-makers in acoustic aspects of transportation.