Exchange knowledges and techniques on roads and road transportation

WORLD ROAD ASSOCIATION

www.piarc.org

10th UIC Railway Noise Workshop, 15 March 2016
What is PIARC?

• Non-political, non-profit association established in 1909
• Aim: promote international cooperation on issues related to roads and road transport
• Members:
  • Principally 121 national member governments (Nov 2015)
  • Regional authorities, collective members, and individual members
• With its broad membership and geographic diversity, the vision of the World Road Association is to become:

  “The world leader in the exchange of knowledge on roads and road transport policy and practices within the context of integrated, sustainable transport.”
PIARC outputs (1/2)

- Technical committee reports
  - 51 reports in 2012 – 2015
  - Available free of charge
- International seminars
  - 26 seminars and 7 workshops in 2012-2015
- The Winter Road and World Road congresses
  - Andorra 2014
  - Seoul 2015 (>2 600 participants)
- Routes/Roads magazine (bilingual quarterly)
PIARC outputs (2/2)

- **Flagship products**
  - Road safety web-manual
  - RNO and ITS web-handbook
  - Road Tunnels web-manual
  - Snow and Ice databook
  - ...
- **Online Terminology Database**
- **Software**
  - HDM-4 (road project appraisal)
  - DG-QRAM (dangerous goods in tunnels)
Monitoring of environmental impacts of roads report

« Monitoring of environmental impacts of roads »

Date: 2012

Author(s) Technical Committee A.1 - Preserving the environment

Puts noise issues in context

• Current practice of monitoring is presented for the different environmental fields: air, noise, water, biodiversity, etc. and is considered at the different phases of a project phase: planning, construction, operation

• Case studies illustrate best practice and show how monitoring can be a useful tool for the design and operation of a road infrastructure as well as for the mitigation of negative impacts on the environment

• Presents a series of environmental indicators currently in use at national and international levels and makes recommendations for effective monitoring
Quiet pavement technologies report

« Quiet pavement technologies »
Date: 2013
Author(s) Technical Committee D.2 Road Pavements

Comprehensive approach

- PIARC analysis in 2010 - answers from twelve countries
- Literature review

- This report describes the main mechanisms involved in the production of noise in the interaction between the tyre and the pavement and the tools to evaluate the noise performance of the pavement surfaces
- The report provides then information about different types of quiet surfaces
- National and multi-national quiet pavement initiatives are described
A significant health issue

- WHO 2011: At least 1 million healthy life years are lost every year due to traffic related noise in the Western part of Europe
- **Road traffic** is the main source of environmental noise
- Road traffic noise pollution mostly shows **an increasing trend**, due to growing urbanisation, increasing demand for motorized transport and inefficient urban land planning

**People exposure to transport noise**

Note. agglomeration > 250,000 inhabitants in EU-27: people affected (left) and people living in “hot spots” (right) (source: EEA report n° 3/2009)
Several approaches

- **Noise pollution is influenced by several factors:**
  - Traffic density, vehicle speed, heavy vehicles, highway quality and configuration…
  - Atmospheric conditions, proximity to houses, topography…

- **“integrated planning” approach:** preventing noise pollution problems by an integrated planning approach to transportation and land use

- **Source orientated actions** are preferable because their effect is wider and not limited to restricted areas
  - They are also often recognised as more cost-effective
  - Examples: low noise pavements, anti-noise screens, berms, traffic management such as speed limit or optimised crossroads, improvement of façade insulation, etc.
Optimisation of the vehicle-tyre-pavement system

- **Power unit noise, tyre/road noise and overall noise vs. speed**
- Numerous mechanisms at play:
  - *Mechanical Vibrations*
  - *Air Vibrations*
  - “*Stick-Slip*” Effect
  - “*Stick-Snap*” Effect
  - *Acoustical Horn*
  - *Helmholtz Resonance*
  - *Etc.*
- **Vehicles:** are designed to comply with regional and national regulations regarding type approval - which include maximum noise levels
- **Tyres:** type approval testing of tyres with regard to rolling noise emission in the EU
Road surfaces

- **Low noise road surfaces are a cost-effective measure**
  - Authorities have been supporting their development for many years
  - There are a number of national/international projects and research programs
- **A few basic rules for designing a silent road surface have been identified:**
  - Sufficiently deep macrotexture
  - Or a porosity made of pores connected to the surface and to one another
  - Macrotexture should be fine and homogeneous
  - Etc.
- **Numerous pavement solutions are available**
  - Most are proprietary
  - The 2013 report analyses them in terms of effectiveness, durability…
1. Cost is an issue
2. Low noise road surfaces age fast
3. Urgent need for **standardisation of assessment methods** for road surface noise efficiency - acoustic labelling
4. Include **truck tyre noise** in mitigation research
5. Work on **better acceptability and performance of porous asphalt pavements**, in particular in terms of cleaning, winter maintenance, within a recycling system
6. **Comprehensive approach**: Integrate in future projects the combination of noise, air pollution, road safety, and other issues
### 2016–2019 Strategic Plan
#### Technical committees & TFs

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#### Innovative financing
- **Road design & infrastructure for innovative solution**
- **Infrastructure security**

#### Coordinating National and Subnational adm.
- **Road design & infrastructure for innovative solution**
- **Infrastructure security**
Environment Considerations in Road Projects and Operations

- Technical committee E.2
- Chair: Helen Murphy (Australia)

- Issue E.3.2: Noise mitigation
  - Evaluate and document traffic noise impacts; examination of potential mitigation measures; reasonable and feasible noise mitigation measures, including regulations and guidance setting noise levels

- Outputs expected through 2016 - 2019
Next PIARC congresses

• 15th International Winter Congress
  • Gdansk, Poland
  • 20 – 23 February 2018

• 26th World Road Congress
  • Abu Dhabi, United Arab Emirates
  • 6 – 10 October 2019
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