

Exchange  
knowledges and techniques  
on roads and road transportation



# WORLD ROAD ASSOCIATION



[www.piarc.org](http://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

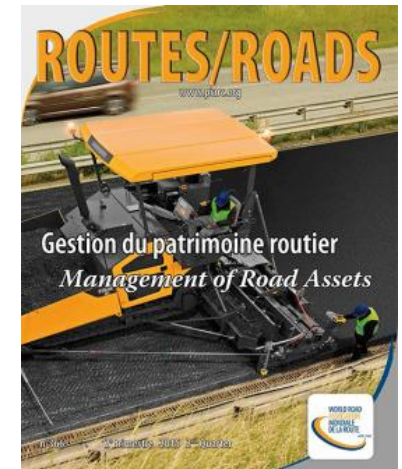
- **Members:**

- 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.”***



- **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)**



- **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

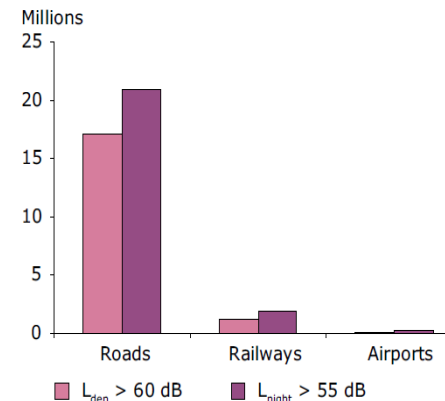
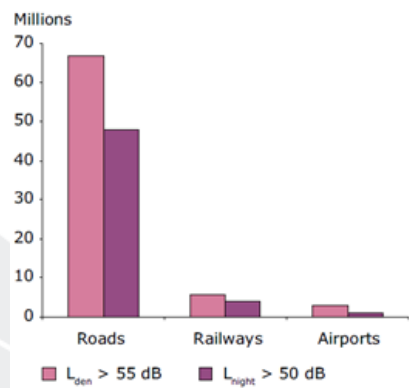
### Comprehensive approach

- 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

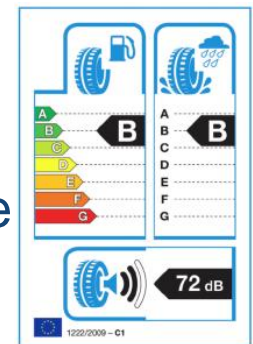
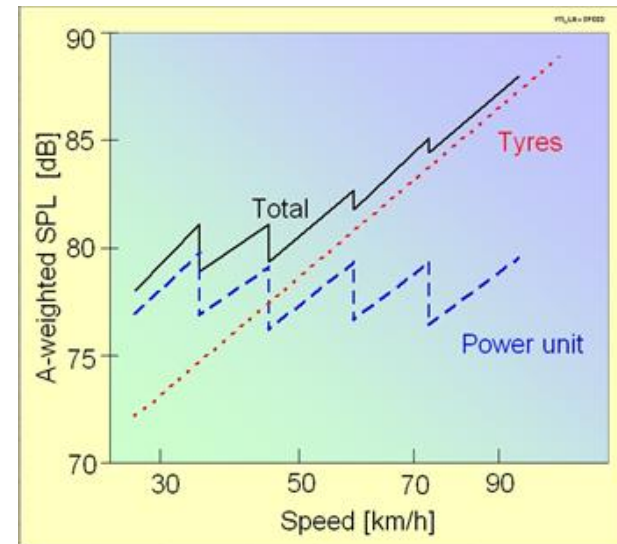
- **Noise pollution is influenced by several factors:**
  - Traffic density, vehicle speed, heavy vehicles, highway quality and configuration...
  - Atmospheric conditions, proximity to houses, topography...
- **“integrated planning” approach:** preventing noise pollution problems by an integrated planning 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

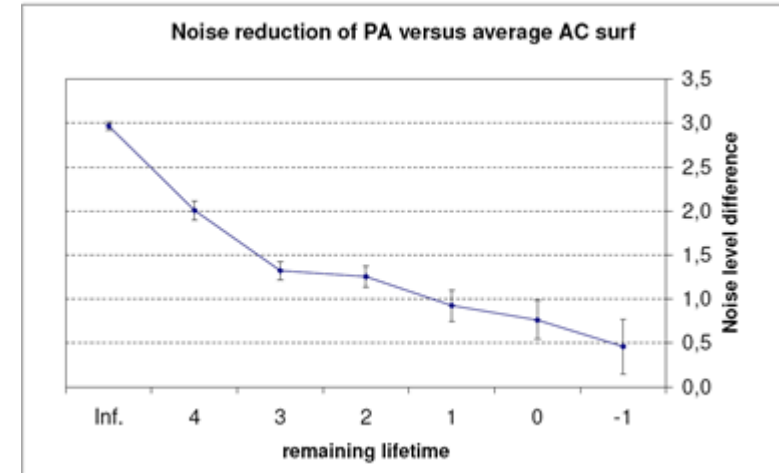


- **Low noise road surfaces are a cost-effective measure**
  - Authorities have been supporting their development for many years
  - There are a number of national/international projects and research programs
- **A few basic rules for designing a silent road surface have been identified:**
  - Sufficiently 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...



# 2013 report conclusions

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

A. Management and finance	B. Access and mobility	C. Safety	D. Infrastructure	E. CC-Environment - Disaster
<p><b>A.1 Performance of transport administrations</b></p> <p><b>A.2 Road transport system economics and social development</b></p> <p><b>A.3 Risk management</b></p>	<p><b>B.1 Road Network Operations / ITS</b></p> <p><b>B.2 Winter services</b></p> <p><b>B.3 Sustainable multimodality in urban areas</b></p> <p><b>B.4 Freight</b></p>	<p><b>C.1 National road safety policies and programs</b></p> <p><b>C.2 Design and operations of safer road infrastructure</b></p>	<p><b>D.1 Asset management</b></p> <p><b>D.2 Pavements</b></p> <p><b>D.3 Bridges</b></p> <p><b>D.4 Rural roads and earthworks</b></p> <p><b>D.5 Road tunnels operations</b></p>	<p><b>E.1 Adaptation strategies / Resiliency</b></p> <p><b>E.2 Environment considerations in road projects and operations</b></p> <p><b>E.3 Disaster management</b></p>
<p><b>Innovative financing</b></p> <p><b>Coordinating National and Subnational adm.</b></p>	<p><b>Road design &amp; infrastructure for innovative solution</b></p>	<p><b>Infrastructure security</b></p>		

# *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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**Patrick Malléjacq**

**Incoming Secretary general of the World Road Association**

