Application of Low Noise Road surfaces in the Netherlands:

Excellent results but not enough to meet the legal targets

Prepared by the Netherlands
For GRB 44 Sept 2006 Geneva
Why should we reduce noise? Noise = Health

DALY= Disability Adjusted Life Years
Noise abatement

Health → Laws → Levels of protection

Conventional way: barriers and insulation.
High growth of traffic → uncontrollable rise of cost
NL: 4 bln EURO for national infrastructure alone

All studies: source abatement is most effective and most cost efficient
(max 1 bln EURO)
Sources of road traffic noise

- wind
- engine
- intake
- gearbox
- exhaust
- tyre/road contact
Source related noise abatement in the road sector

- Direct noise abatement at the source
  - Vehicles (power train and wind noise)
  - Tires
  - Road surfaces

- Indirect noise abatement at the source:
  - Town & infrastructure planning
  - Traffic management
    - Speed & Driving behavior
    - Restriction of vehicles allowed in areas or time
Responsibilities

- Vehicle Noise limits: EU and UN/ECE
- Tire Noise limits: EU and UN/ECE
- Road surfaces: national or local
Potential of traffic noise reduction
game, tyre and road surface
Porous asphalt:

Since 1940? reduction of splash & spray on airport runways
Since 1980: application as low noise road surface (-3 dB at 120 km/h)
Acoustic optimisation of porous asphalt

1990: Two layered porous asphalt with improved surface texture
new types of silent Roads

2000: application of semi porous thin layers (very smooth surface texture)

Two-layered Porous Asphalt

Thin Layer (semi porous)
Noise reducing Asphalt Layers

![Graph showing the comparison of noise levels for different asphalt layers based on car speed. The graph plots SPB-level (dB(A)) against car speed (km/h). Different asphalt layers include Dense Asphalt Concrete, Porous Asphalt 0/16 (standard), Two-layered PA (fine), and Silent thin Layer. Each layer has a distinct line on the graph, illustrating how noise levels vary with speed.]
History of low noise road surfaces in the Netherlands

- 1998: Type approval system Min Env
- 2001: Stimulation program Min Env
- 2004: Innovation program Min Env + Min Transp

Number of registered low noise road surface products

- 1990: 0
- 1995: 3
- 2000: 25
- 2005: 35
Croad for light vehicles

Low noise road surfaces in the Netherlands
Status low noise surfaces in the Netherlands 2006

Highways:
- 60% single layer porous
- 3% double layer porous
- Pilots on thin layers

Future
- Double layer = standard in high noise regions
Can we sit back and relax now?

Inhabitants of EU15 exposed to road traffic noise (data from 2000):

<table>
<thead>
<tr>
<th>Noise Level</th>
<th>Percentage</th>
<th>Number of Inhabitants (mln)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;55 dB(A)</td>
<td>32%</td>
<td>120</td>
</tr>
<tr>
<td>&gt;65 dB(A)</td>
<td>13%</td>
<td>49</td>
</tr>
<tr>
<td>&gt;75 dB(A)</td>
<td>2%</td>
<td>8</td>
</tr>
</tbody>
</table>

Conclusion: NO!

the necessary reduction is much bigger than the 5 dB we get from road surfaces
Spread in vehicle noise levels build up of two components: road surface effect, tyre/vehicle effect.
What if we do not achieve the vehicle/tire targets?

Health targets are often not reachable

Local situations will enforce more often drastic measures
  • drastic reduced speed
  • Toll tunnel
  • total vehicle ban

Final cost for society is much higher than necessary
The end
Thank you for your attention