Innovative pre-fabricated Pavement Systems

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Initiative

In 2000 the Dutch Ministry of Transport challenged the market to develop pavement systems that meet the following general requirements:

- **Overcoming the limitations of traditional pavement construction**
- **Adaptable for future functions**
- **Less traffic jams**
- **Low noise production**

Technical requirements

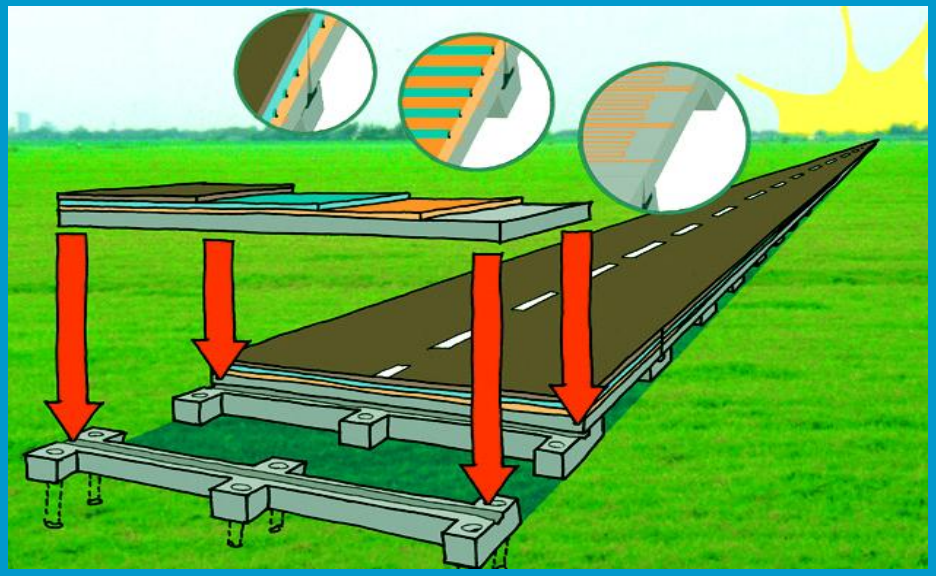
- **Fast to apply (and to remove!)**
  - 100 m/h (= 50% faster than now)
  - independent of weather conditions
- **Function specific design**
  - Major reduction of noise level, more than 5 dB(A) compared to dense asfalt concrete (= reference wearing course)
  - Same permeability as porous asphalt
- **Modular construction**
  - Prefab production
- **Adaptable for future functions**
  - Sensors, energy, etc

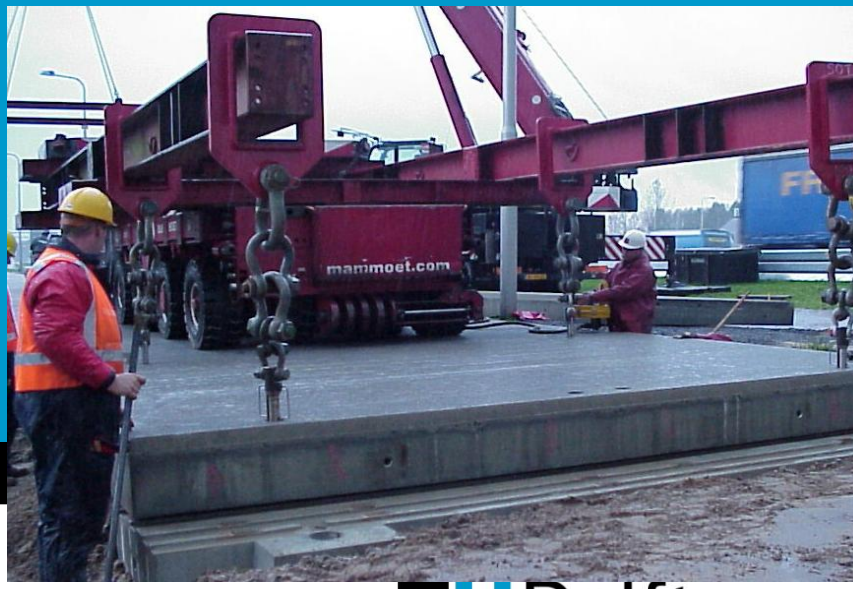
State of the art and practice

- 2001 - development and testing of systems: 4 systems were tested on a bypass of a highway. Two systems (rollpave and modislab) now used on a highway and under observation

- 2009 Rollpave system used for PERS (special trial to reach 8-10 dB(A) noise reduction) on a bypass of a highway

Modieslab





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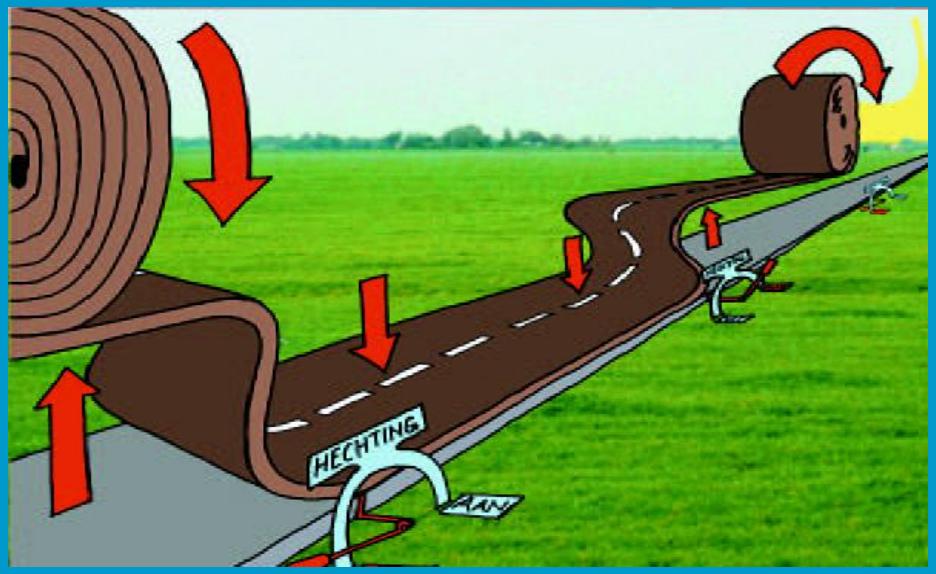
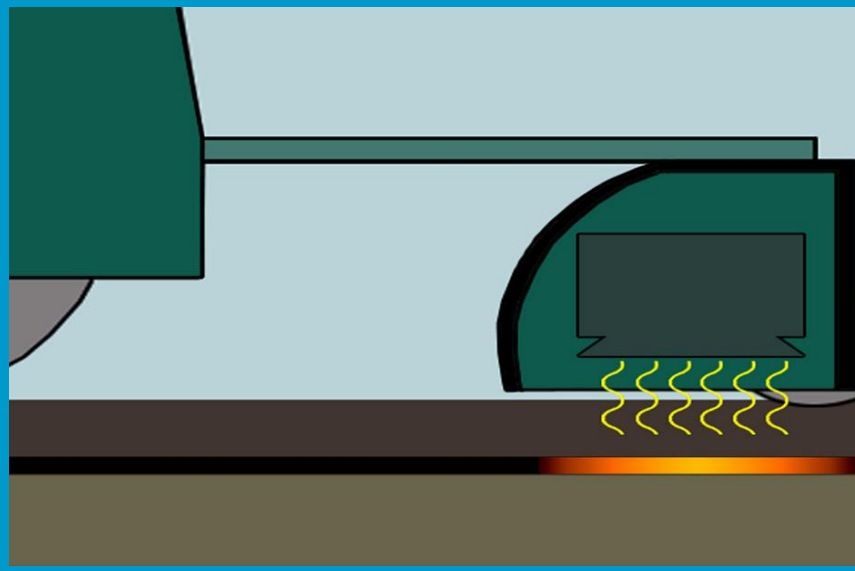
Rollpave





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Expected contribution to development of more sustainable pavement solutions

- Factory produced, reduce variability
- Modular system: fast removing and placement of failed section
- Strong noise reduction of 5-7 dB(A) compared to the reference
- Anticipation on change possible by adding functions
- Dedicated trailerroads

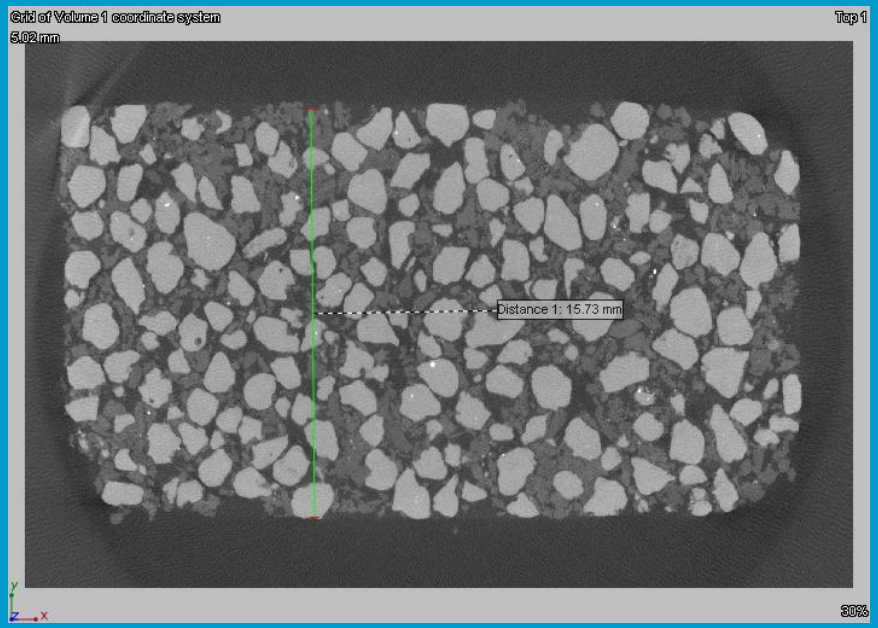
Current gaps in knowledge

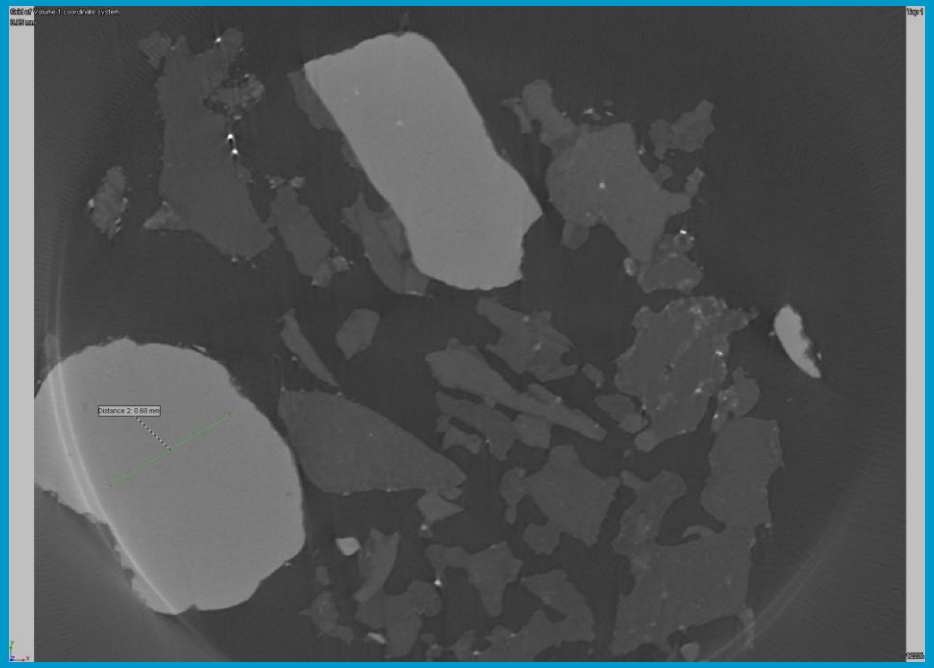
- Manufacturing process
- Material development (two-layer porous concrete, PERS)
- Maintenance techniques (a.o. skid resistance toplayer)
- Models for the toplayer

Main research questions

- Smart production in the factory
- Combination of requirement for the wearing course (noise, skid resistance, rolling resistance, etc)
- Development of materials
- Adhesion of toplayer to pavement structure (PERS)

PERS: Porous Elastic Rubber surface



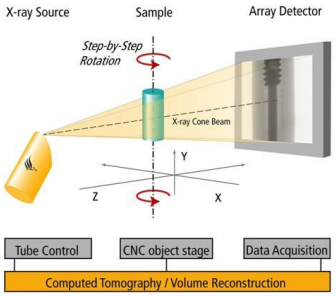


Principle of CT

Acquisition

of projections
during step-by-step
rotation by 360°

Steps < 1°



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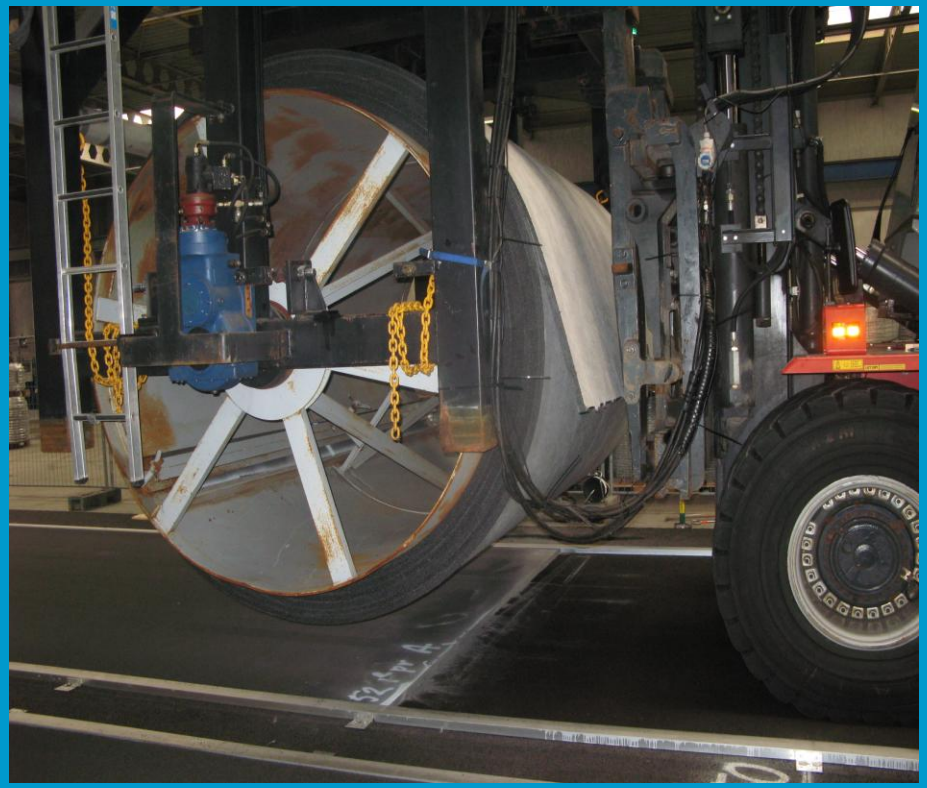
PERS produced in the factory



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Test trial PERS

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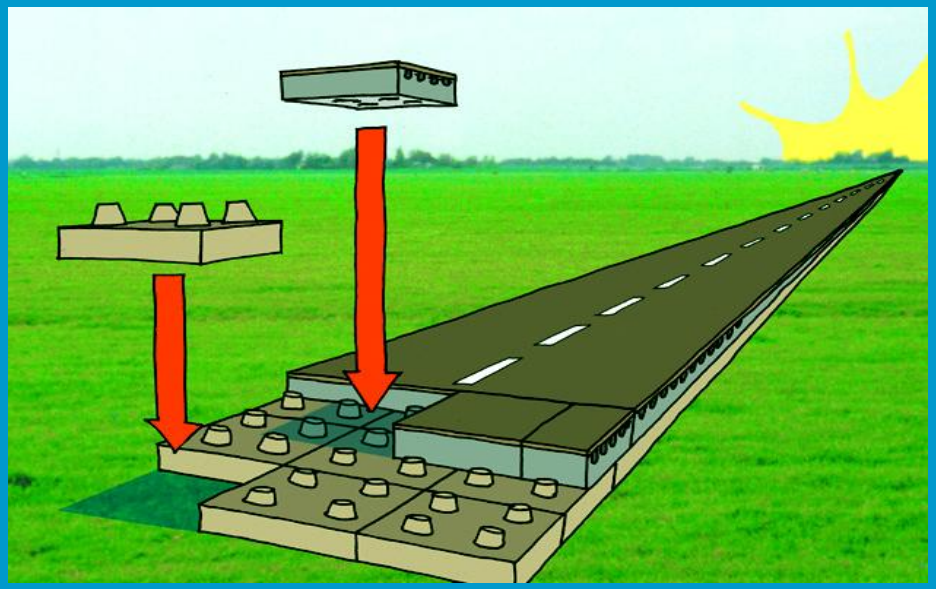
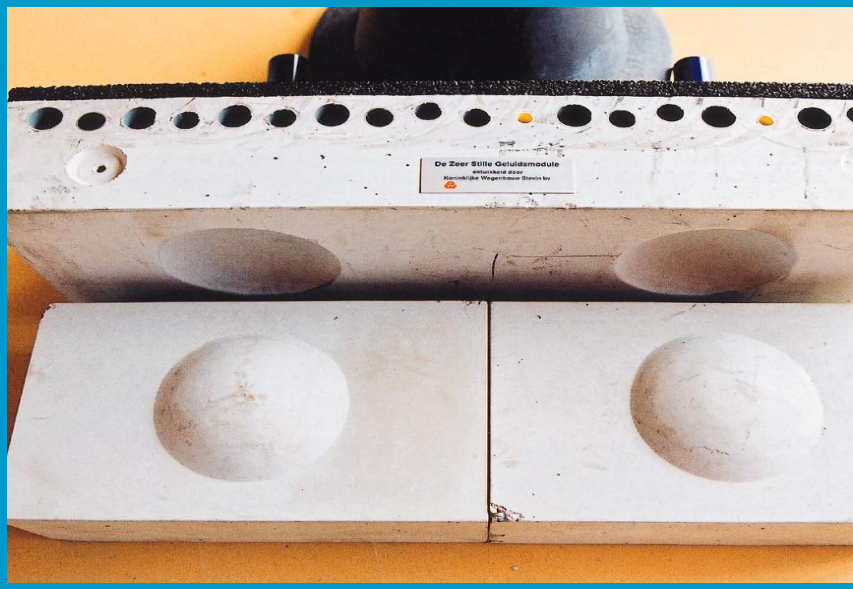
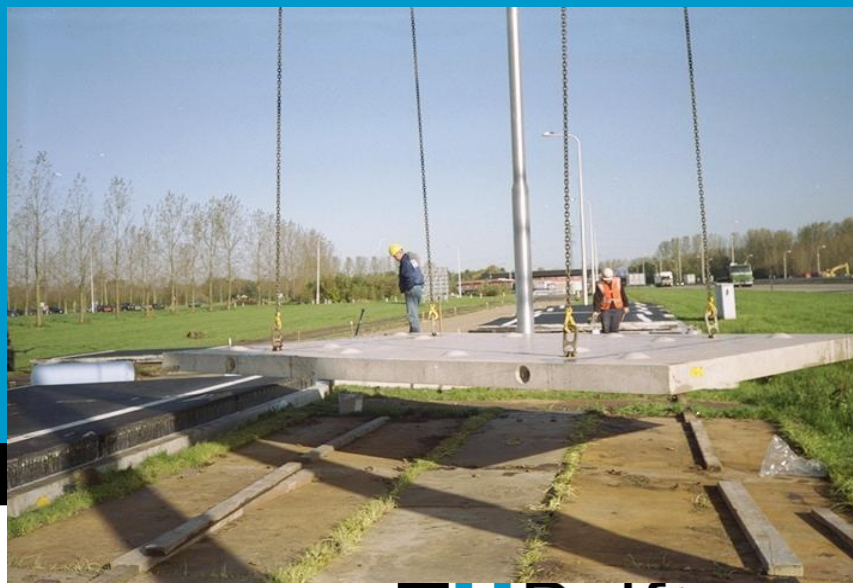
The Very Silent Sound Module







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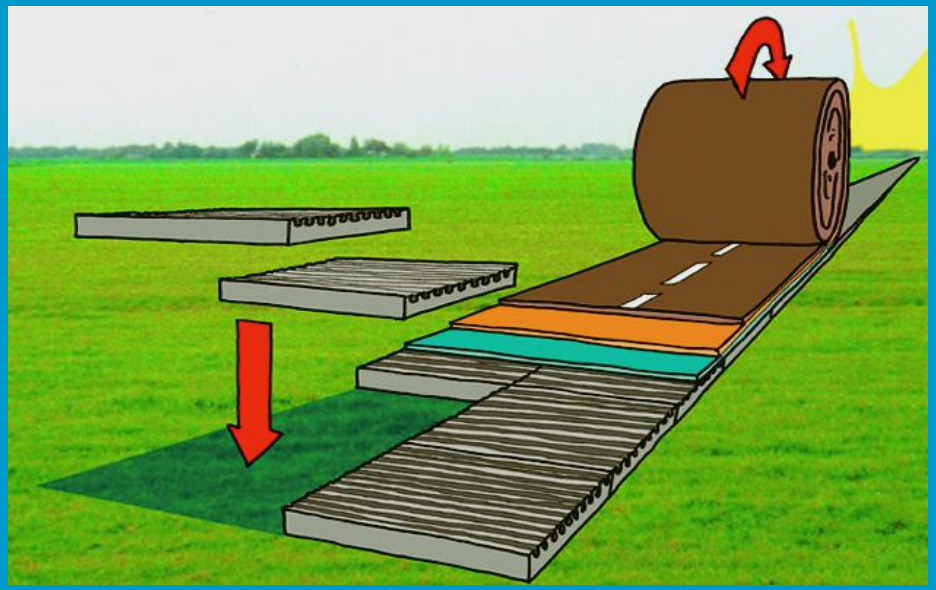
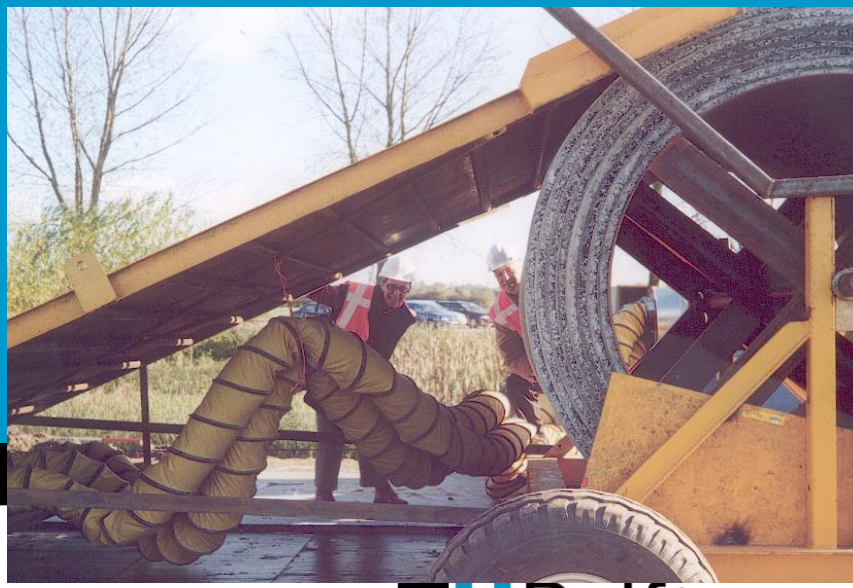
The Rollable Road





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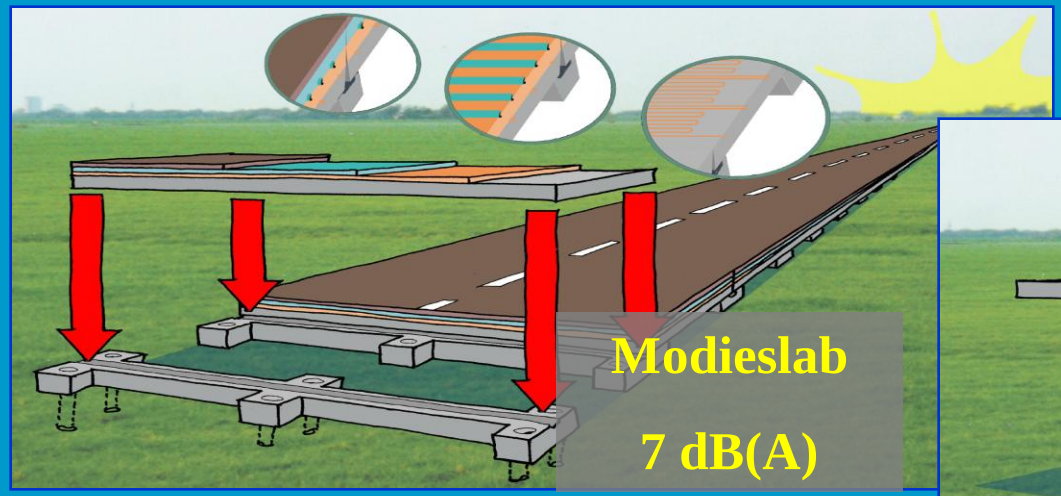
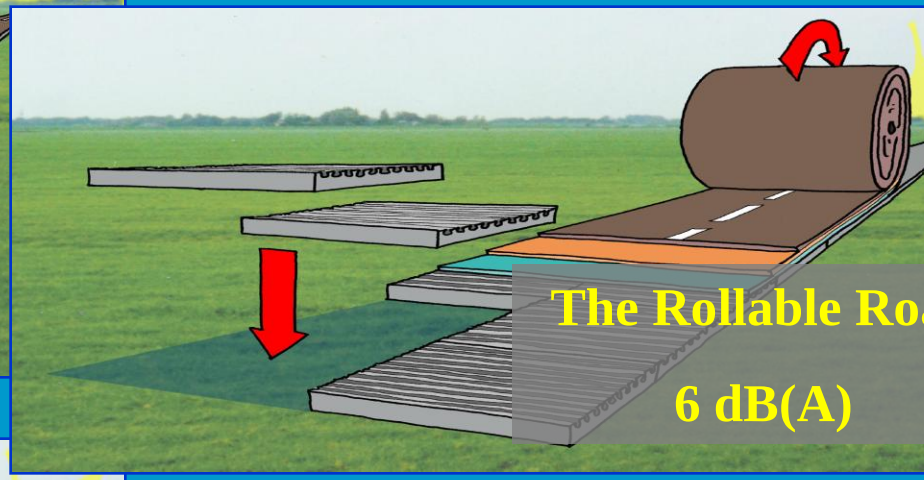
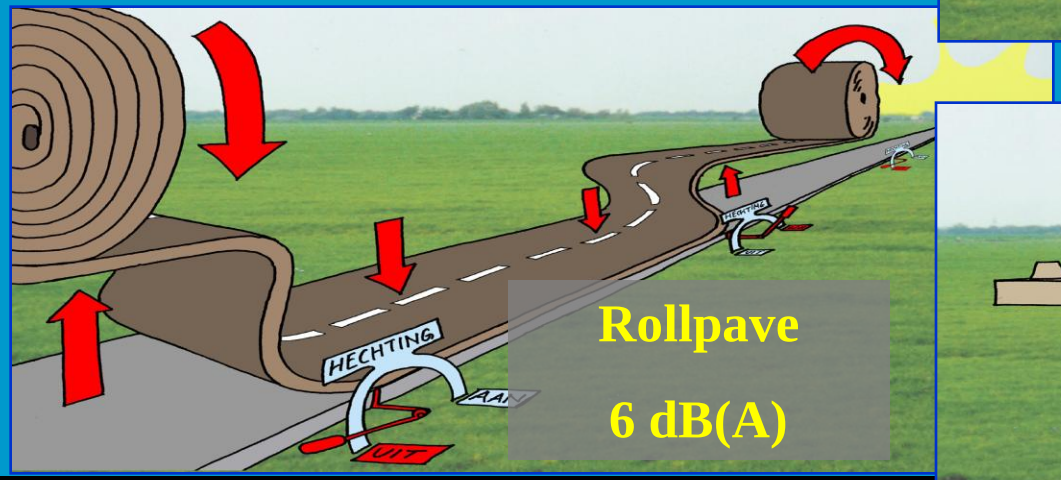
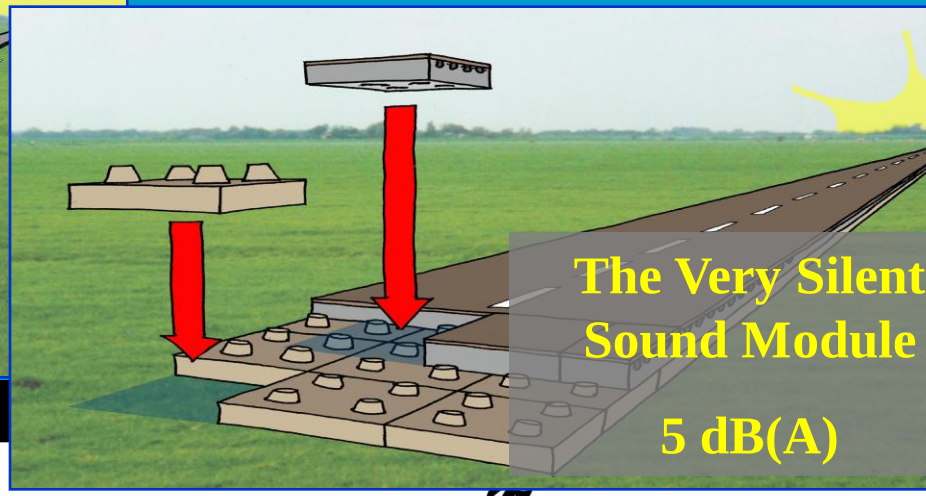
Noise reduction results so far(compared to DAC)









The assumption was 8-10 dB(A)

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