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On the need for innovation in road engineering - A Dutch example

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Rijkswaterstaat

Why do we need innovation?

- Companies need it to get a competitive edge
- Societies need it to develop
  - Innovation drives change

A Dutch example:

- In less than a century, much has changed due to
  - Technological development (cars!)
  - Population change
  - Health and environmental awareness

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  - Coping with change, requires innovation!
- This past century, technological changes drove rapid changes

Climate change

Changing role of governments/
International companies

Decreasing natural resources

Economic crisis

Globalisation

Individualisation

Demographic developements

Why do we need innovation?

- Many world wide trends cause rapid changes
- The trends are the same the world over
- But: their manifestation differs based on local conditions
  - Draught or floods

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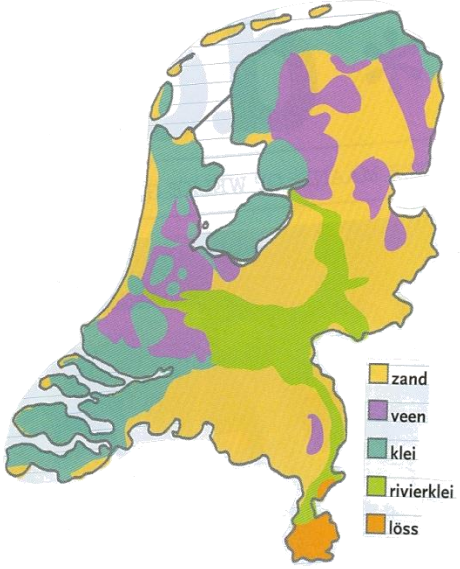

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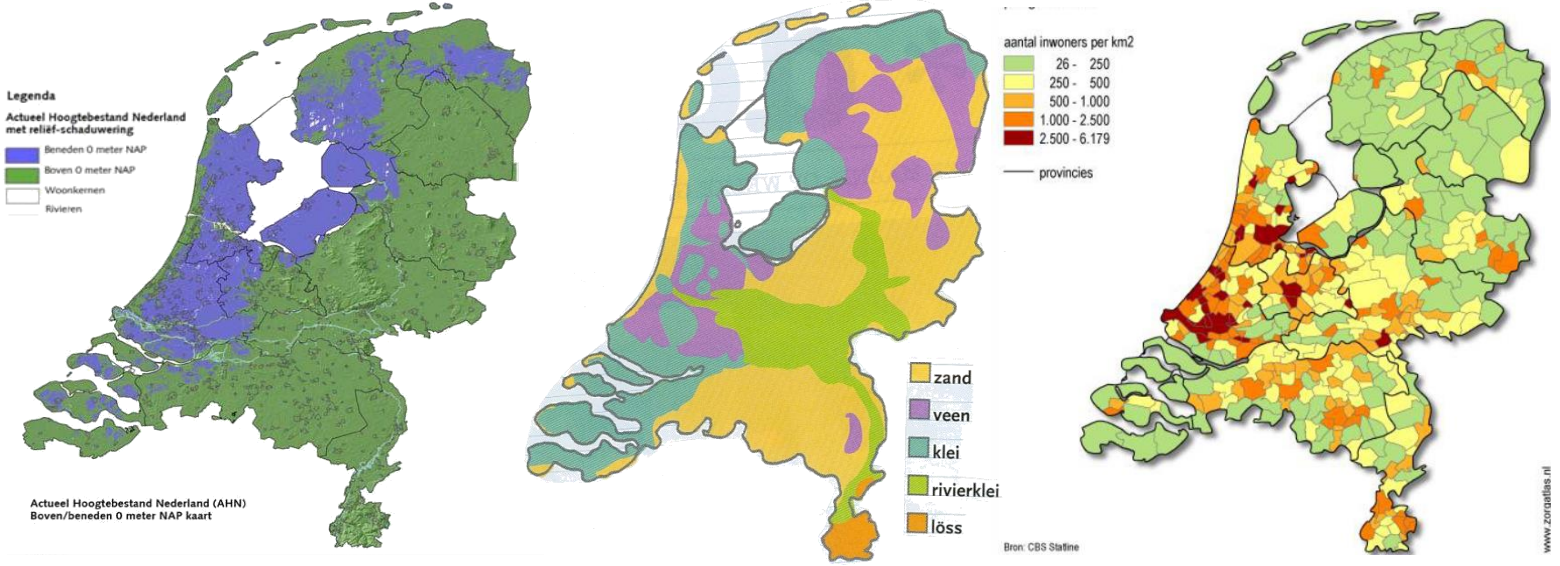

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- In the Netherlands the manifestations include:
  - Higher ground water table, more heavy rains
  - Higher cost for bitumen, natural stone -> alternative materials
  - Less social acceptance of and budget for maintenance
  - Increasing traffic and less acceptance of the effect of traffic on the people living near the road

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Why do we need innovation?

Different environmental loads

Alternative materials

New maintenance techniques

Increasing loads, new requirements

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Common denominator: change, variety

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Why do we need innovation?

- Although the effects vary
- All over the world we face rapid changes
- And we need to tools to deal with those changes
- Pavement Engineering is, because of the many variables, still mainly empirical
- The rapid changes mean the existing experience loses validity

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How do we use innovation?

- Rijkswaterstaat (RWS), Dutch highway authority uses a three level approach to deal with the need in innovation
  - Innovation programs: government initiated & funded, to address a specific issue
  - Innovation Test Center (ITC): unsolicited, unique, with benefits for RWS, shared costs for testing&validation
  - Individual Validation process: unsolicited, not quite unique, no RWS contribution but requirements to assess potential RWS risks

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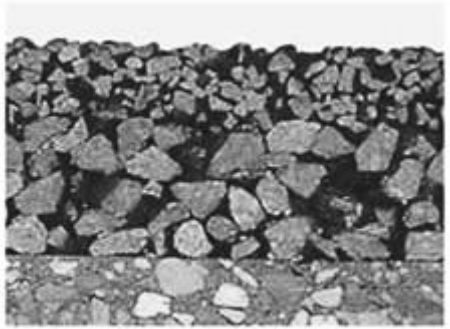
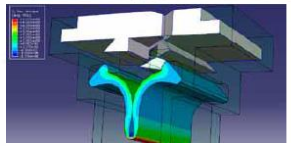
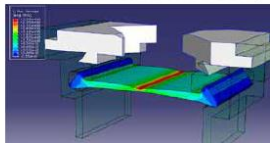
How do we use innovation?

- Examples of government initiated programs:
  - Road to the future: potential of pre-fabrication
  - Innovation noise program: 2L Porous Asphalt
  - Silent, long lasting joints







How do we use innovation?

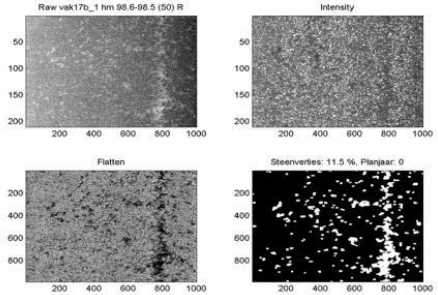
- Innovation Test Center:
  - Started in 2001, 10-15 applications/year, 5/year accepted and started and 2 to 3 a year finished
  - Examples: (longitudinal) joint protectors and a method for low temperature production of mixtures with reclaimed asphalt (greenway LE)

How do we use innovation?

- Individual validation process:
  - RWS contracts specify that materials and techniques must be “fit for use”: long term experience or validation
  - Validation is 3 step approach: paper info on validation, lab tests and (go/no go) field trial
  - Mostly alternative materials: PA with RA, warm mixes
  - Process is under development: intake procedure, more standardized, clearer information for developers and monitoring performance in practice

How do we use innovation?

- Examples of ongoing innovation projects:
  - Laser monitoring of rafeling (under traffic) => more objective, less hindrance
  - Asphalt with steel fibres (healing with induction)
  - Rejuvenators (counter-act aging)



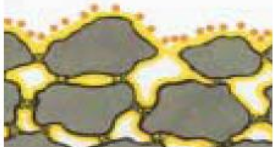
How do we use innovation?

- We all face changes and challenges, we all try to deal with them
- Exchange information on what we do & how we do it
- Looking at the innovations themselves, especially the rejuvenators seem likely to work world wide

Aged PA after cleaning

Situation after sealing

Sanding for skid resistance



Thanks to:

My co-authors

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