



Controlling the subsoil related behaviour of Dutch highways

A.A.M. Venmans

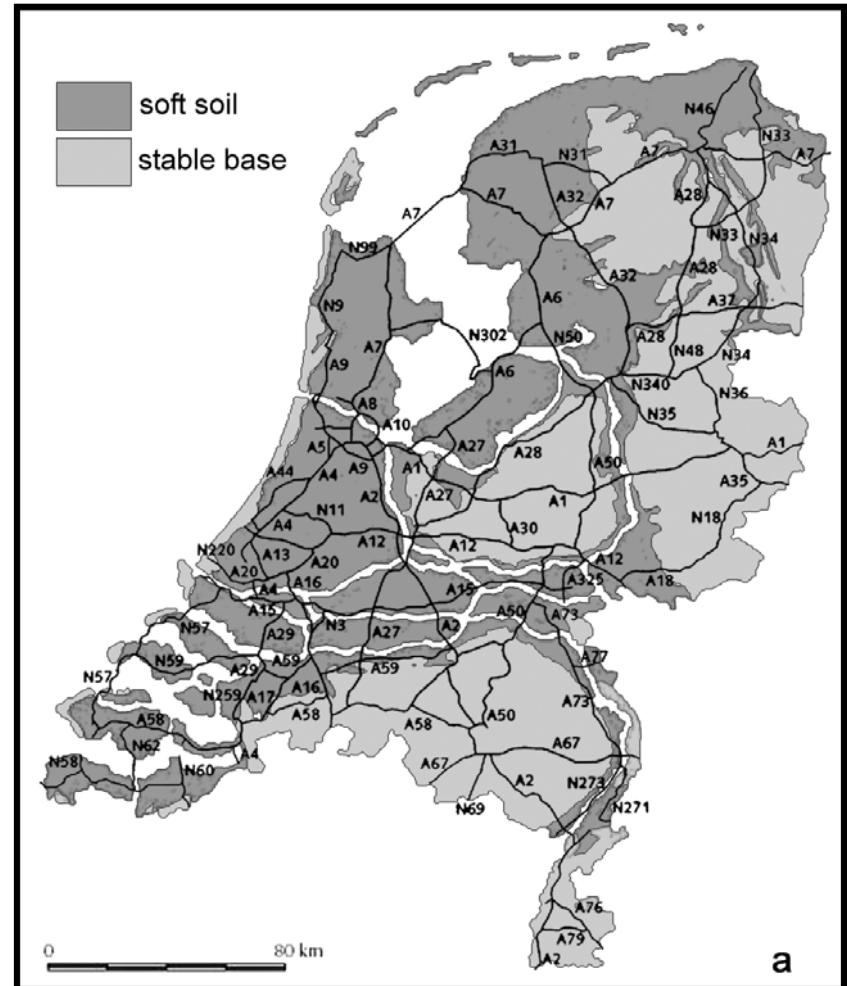
- GeoDelft / Deltares
- Consultant
- a.a.m.venmans@geodelft.nl



Relevance

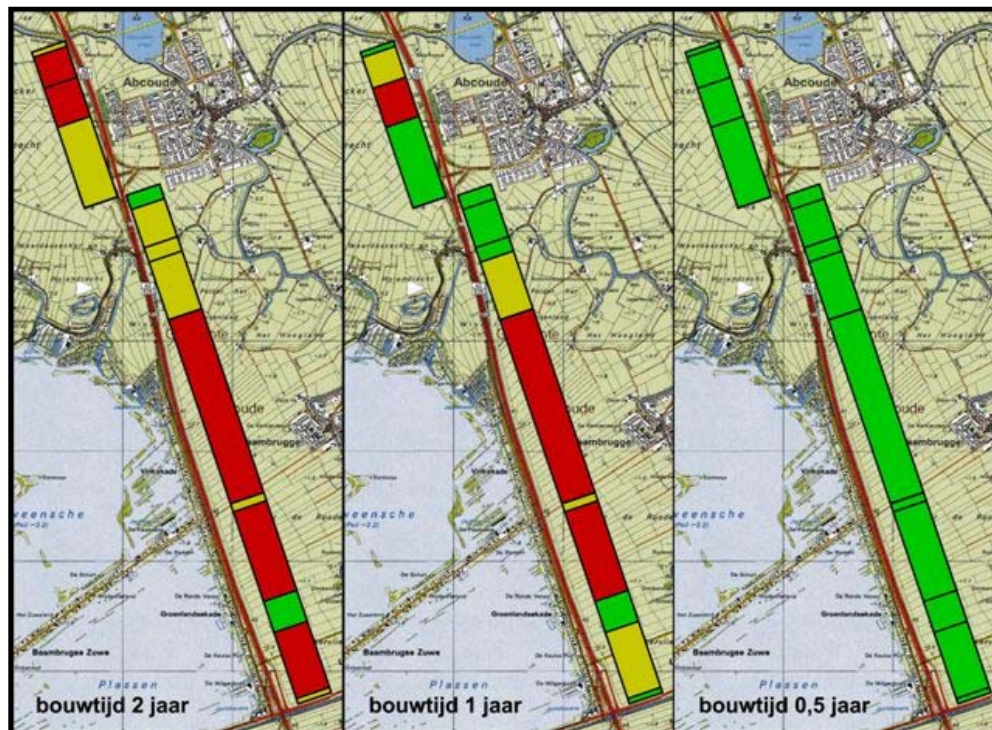
Building on soft soil:

- differential settlements
- high ground water tables
- man induced subsidence



Relevance

New infrastructure on soft soil: trade-off between construction time, budget and maintenance



- traditional
- vacuum surcharge
- piled embankment

2 years

1 year

0.5 year

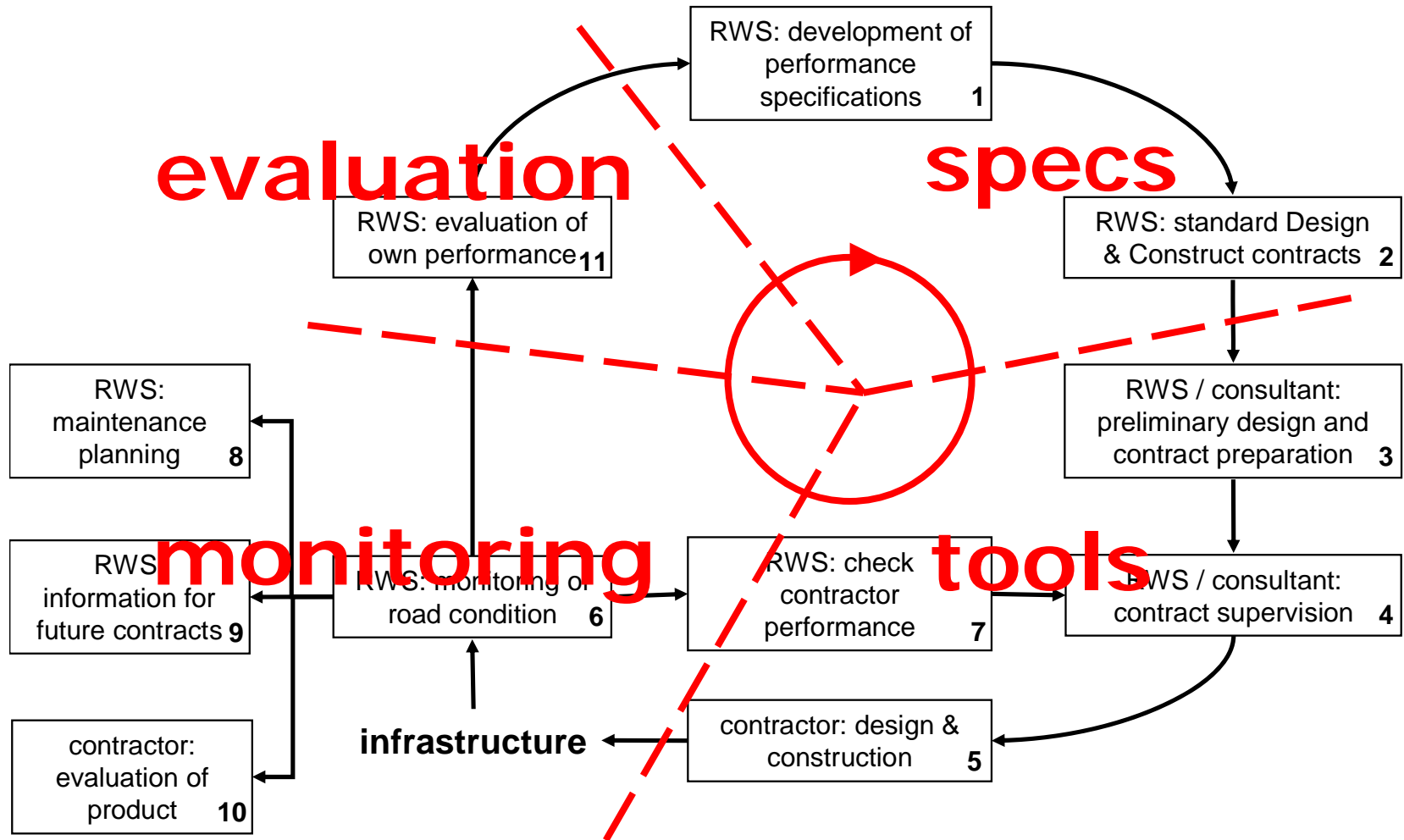
Relevance

Subsoil related maintenance: 35 M€ annually,
16% of 200 M€ maintenance budget

Back analysis of failures:

- design models not validated
- ignoring basic geotechnical behaviour
- ignoring historical data
- reducing construction time
- poor construction
- reluctance to take adequate actions

Critical elements





Indicators

'Hard' indicators:

- maintenance costs
- technical condition
- data on future behaviour

Current situation: not available

Indicators

'Process' indicators:

- matching Service Levels, contract specifications and budgets
- uniform guidelines
- validated tools
- monitoring of relevant quantities
- evaluation of procedures
- exchange of knowledge, data

Current situation: working on improvement



Actions

- Validation of tools
- Monitoring of relevant quantities
- Acquisition of data indicating future behaviour
- Evaluation of risk management
- Organisational learning

Key issue: from coordination to integration of activities of parties involved