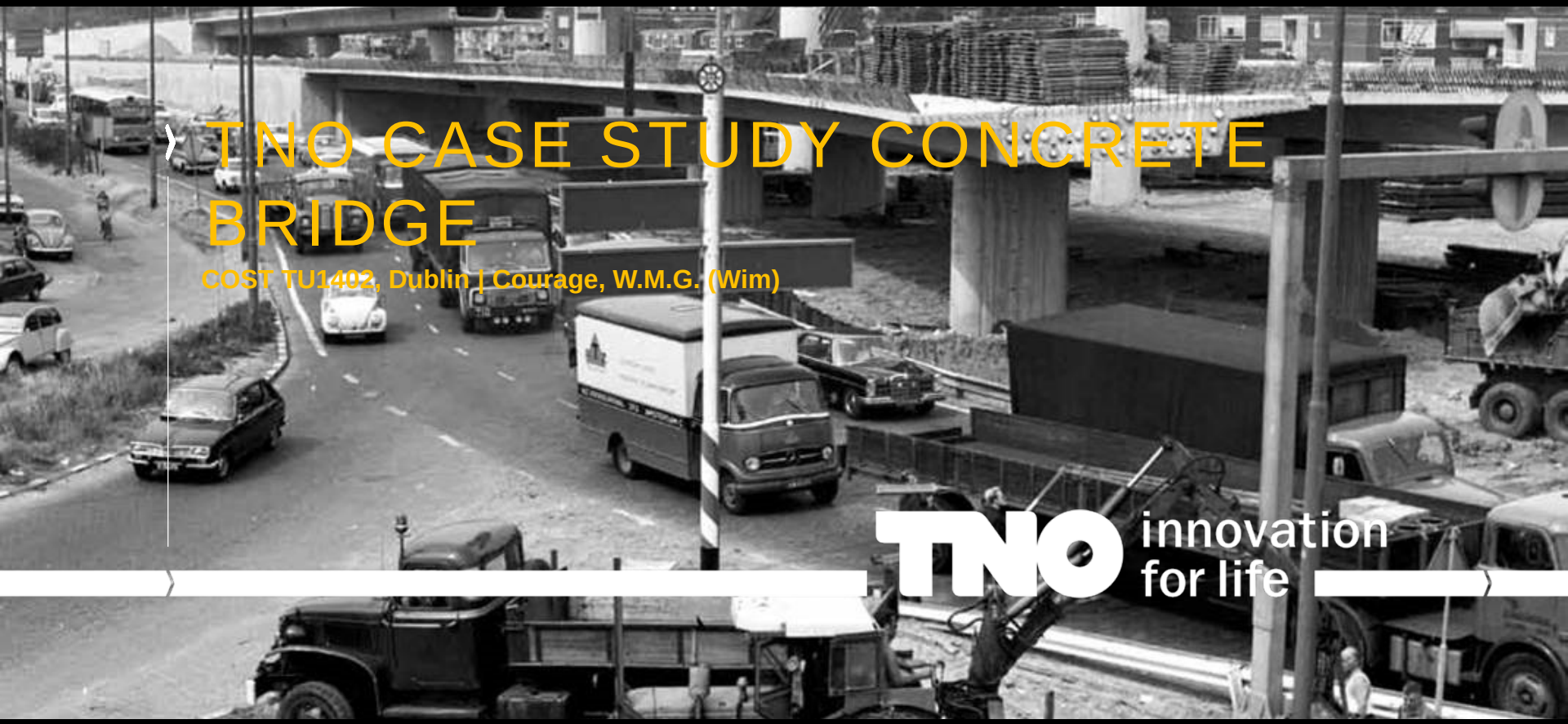
TNO CASE STUDY CONCRETE BRIDGE
COST TU1402, Dublin | Courage, W.M.G. (Wim)
TNO innovation for life

Early Research Program ERP_SI_BRIDGE : Scope & focus

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- **Accounting for multiple sources of uncertainty, i.e.:**

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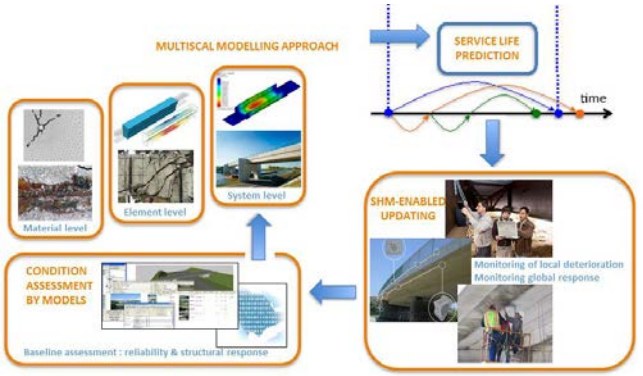
ASSESSMENT & PREDICTION approach



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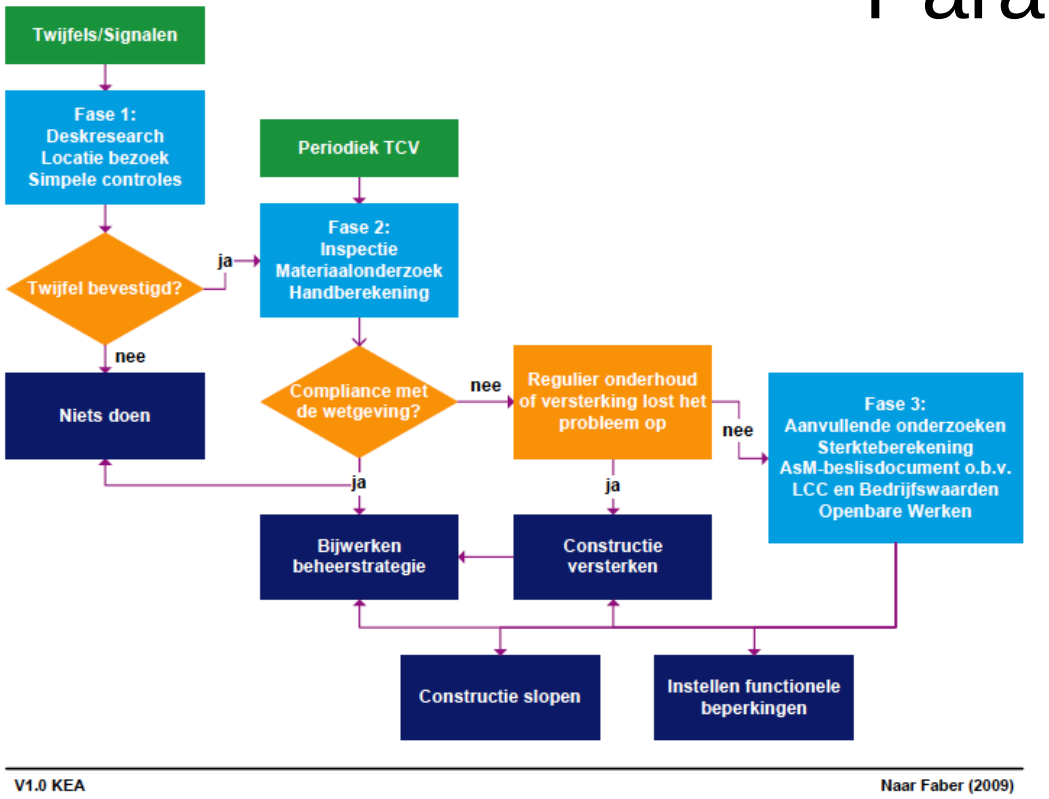


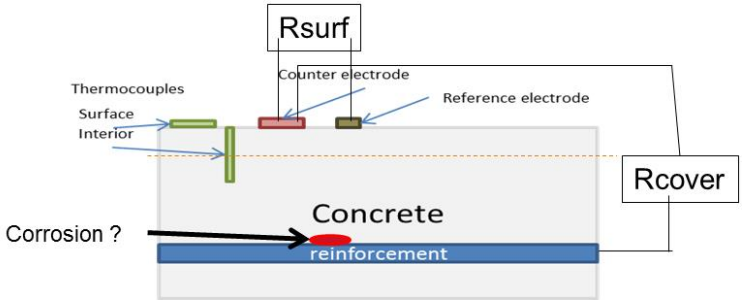
Parallel Developments:

Guidelines Structural Safety
National level (NRA)

CUR-recommendations
Bridges local authorities,municipalties

Reasoning for decisions based on information ??

SHM (MSDF) : Pre-processing of data & data driven modelling



Measured parameters
Corrosion potential - Ecor
Corrosion rate – icor – LPR
Corrosion rate – icor – EN
Concrete cover resistivity – Rho_co
Concrete surface resisitivity – Rho_s
Air humidity – RH
Air Temperature – T_air
Concrete cover temperature T_cover

- **MSDF: reliable corrosion detection**
  - measuring system is based on multiple sensors and interpretation model
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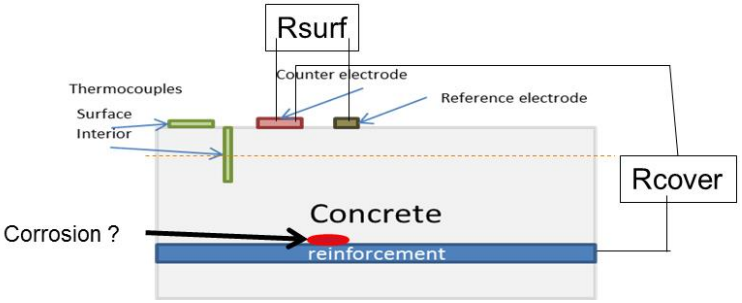

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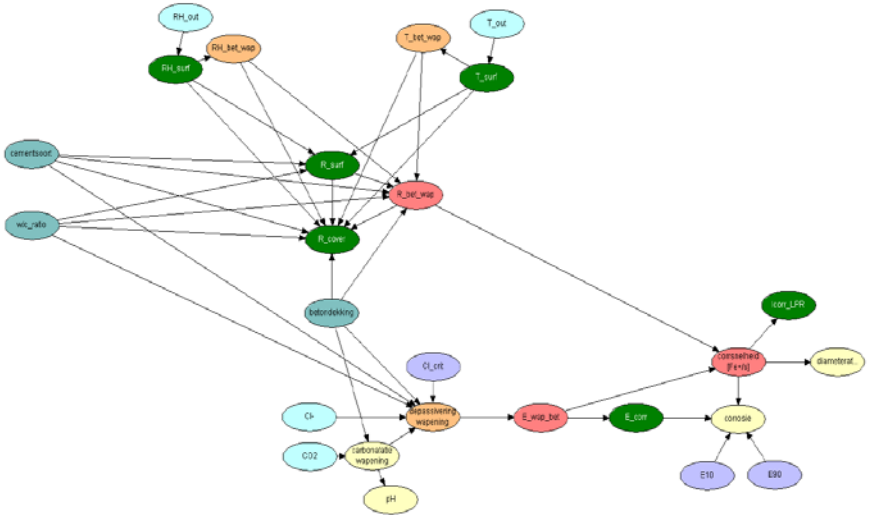
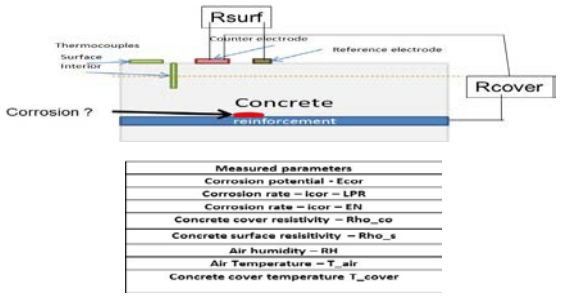
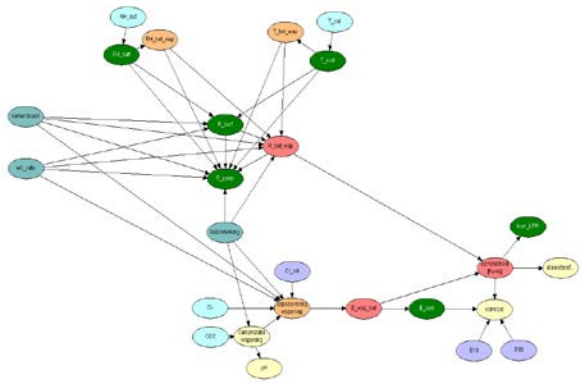


SHM (MSDF) : Value of Information

- Vol
  - Compare the added value of the MSDF measurements to more traditional corrosion state measurements based on one indicator, e.g. electrical current.





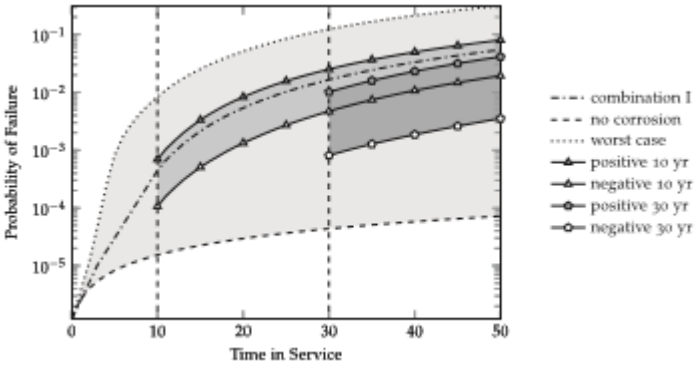
SHM (MSDF) : Possible Structures

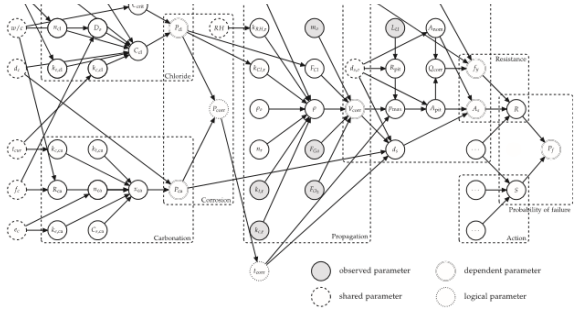
- River Lis bridge, Portugal

- Amsterdam City Bridges

- Rotterdam City Bridges

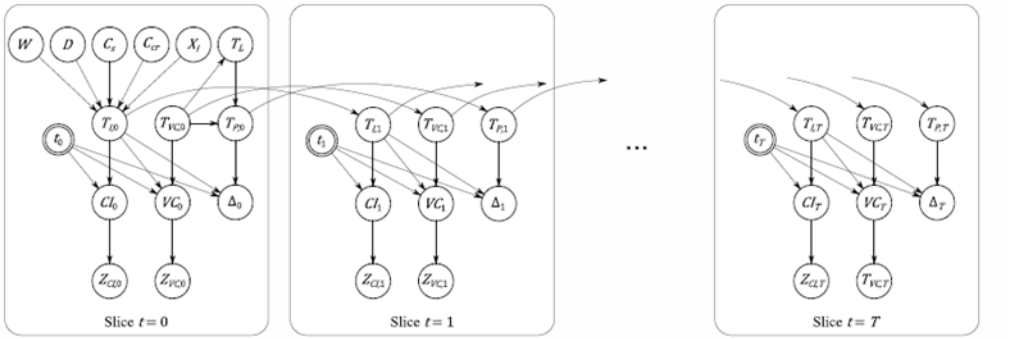
SHM (MSDF) : VoI Approach





Reliability assessment of deteriorating reinforced concrete structures by representing the coupled effect of corrosion initiation and progression by Bayesian networks

J. Hackl [a,*], J. Kohler [b]



A software prototype for assessing the reliability of a concrete bridge superstructure subjected to chloride-induced reinforcement corrosion

Ronald Schneider
BAM Federal Institute for Materials Research and Testing, Berlin, Germany
Sebastian Thöns
Technical University of Denmark, Lyngby, Denmark
Johannes Fischer, Maximilian Bügler, André Borrmann & Daniel Straub
Technische Universität München, Germany

SHM (MSDF) : VoI Approach

- **Concrete Bridge: corrosion of reinforcements**
- **Compare the added value of the MSDF measurements to more traditional corrosion state measurements based on one indicator, e.g. electrical current.**
- **Dynamic Belief nets & LIMID**
- **Current practice / Reasoning for decisions based on information**
- **Open to team up with …..**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