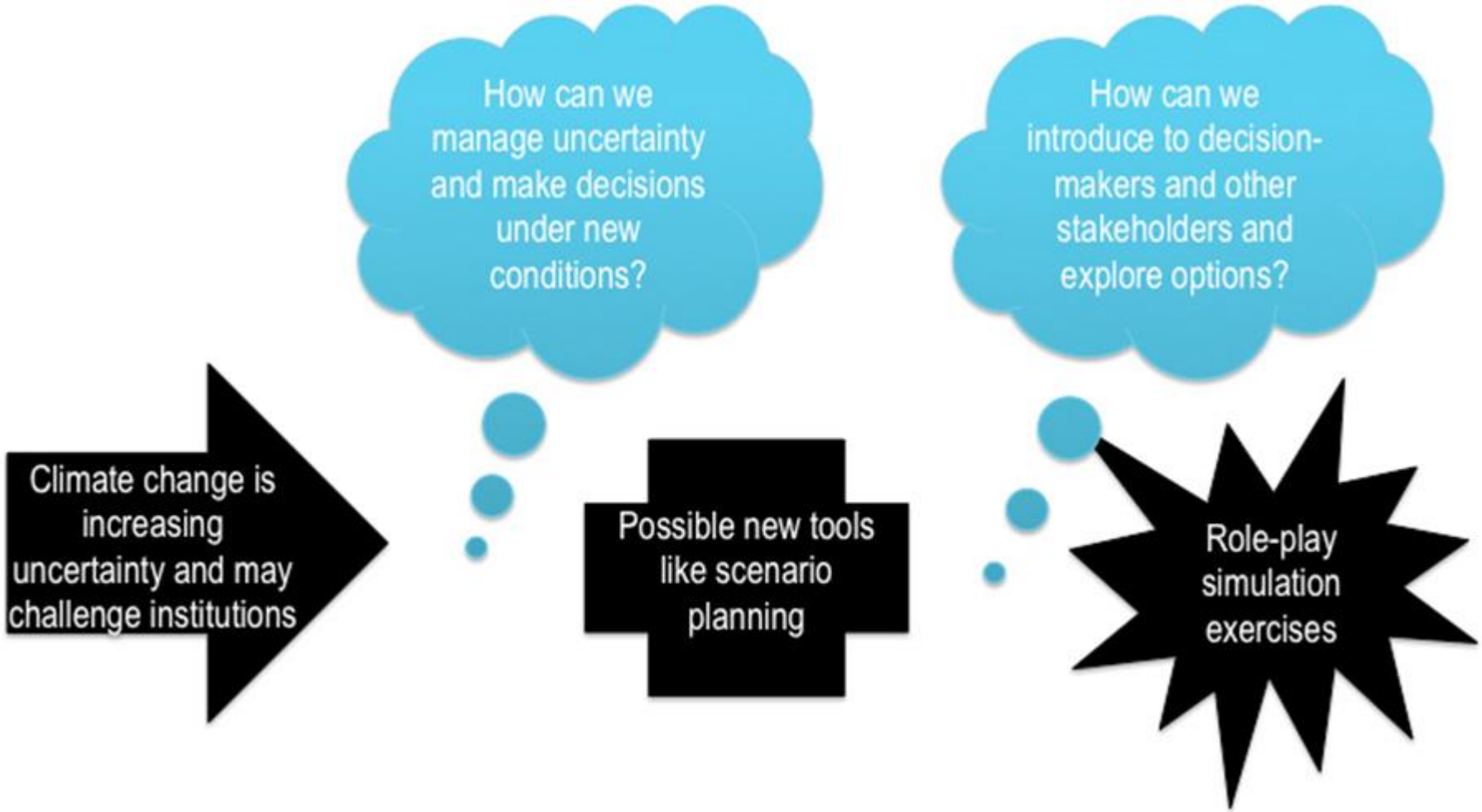



Serious game
Harbouring uncertainty in infrastructure decision making

Todd Schenk (MIT)
Nienke Maas (TNO)
Roel Massink (TNO)


TNO innovation for life

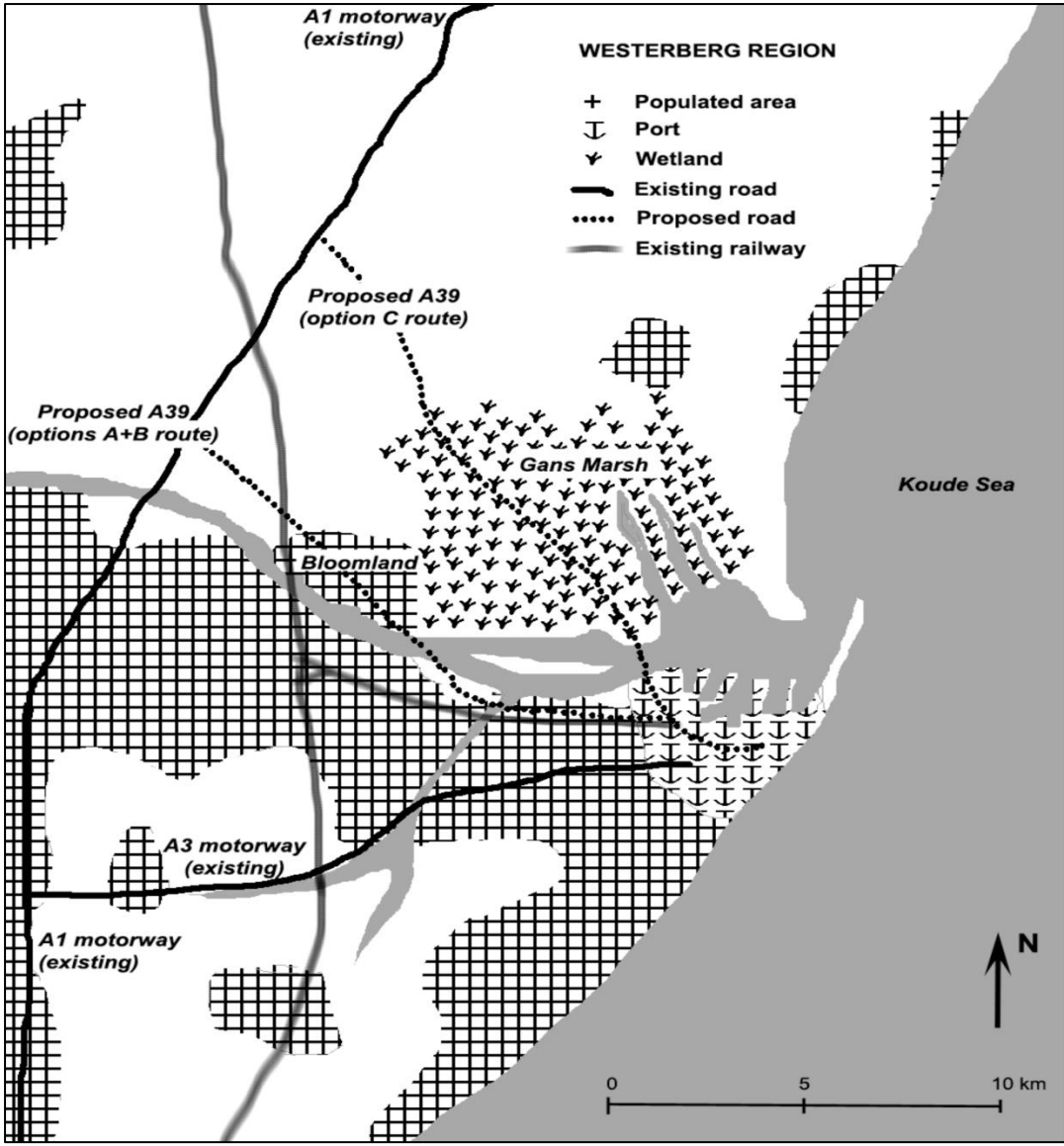
General approach (in development of the game)



TNO innovation for life

The game: set up

- Decision making on new road
- 4 options
- Climate change advisory group
- Task: to prepare agreements
- If no agreement: director decides




Stakeholdergroup

- *Deputy-Director of the Palgrond Transportation Agency Regional Office*
- *Advisor to the Westerberg District 4 Alderman*
- *Project Manager, Westerberg Department of Traffic*
- *Environmental Impact Representative*
- *Deputy Head of the Community Relations Unit, Westerberg Port Authority*
- *Senior Engineer for New Projects, Palgrond Transportation Agency*
- *Flood Protection Specialist, Palgrond Infrastructure and Planning Agency*


2 different tools to introduce climate change

- Scenario's (both on traffic and climate change)
- Risk assessment (mainly on climate change)


TNO innovation for life

4 scenario's (both traffic and climate change)

Wet and Quiet Precipitation and/or riverine flodding leads to higher water levels in the near future Vehicular traffic volume remins constant or declines in the coming years	**Wet and Busy** Precipitation and riverine flooding leads to higher wate rlevels in the near future Vehicular traffic increases steadily and substantially in the coming years
Dry and Quiet Slow or no increase in precipitation and flooding risks Vehicular traffic volume remains constant or declines in the coming years	**Dry and busy** Slow or no increase in precipitation and flooding risks Vehicular traffic increases steadily and substantially in the coming years


Risk assessment version, Projections

- **Warming** is very likely.
- 0.75 – 1.5 °C by 2030
- 1.5 – 3 °C by 2050
- 2.5 – 4 °C by 2080

- Changes in **precipitation** are not as certain:
- 0 – 5% by 2030
- 3 – 10% by 2050, more than 7% cause major problems
- 6 – 15% by 2080

- **storm intensity and associated flooding**:
- 1:400 (i.e., once every 400 years on average) by 2030
- 1:250 (i.e., once every 250 years on average) by 2050
- 1:150 (i.e., once every 150 years on average) by 2080
-
- **Sea level rise** and **water level rise in the river and harbor** extremely likely:
- 5 to 12 cm by 2030
- 15 to 30 cm by 2050
- 30 to 60 cm 2080


TNO innovation for life

Experience

- Two game days to experiment (feb 2013)
- Participants of PoR, RWS, City of Rotterdam, Deltalinqs
- Results were very positive (mark 8 - 9)
- Similar as in practice
- Very useful to learn how to incorporate climate change in decision making
- Makes clear the use of knowledge in decion making processess
  - Climate change > new arguments, high uncertainty: not taken into account
  - Traffic forecasts > old arguments, high uncertainty: taken into account


What's in it for me?

- Learn and experience with different methodologies to deal with uncertainty
- Learn how to incorporate climate change in decision making
- Learn how to involve and show information from different groups and deals with several stakes
- Learn about the 'shortcomings' of detailed knowledge in uncertainty (know more doesn't mean you can take better decision)

Who's 'me'?

- Decision makers
- Advisory boards for decision makers
- Civil servants who prepare models/ and knwowledge for decision makers


Necessary to play the game

- Group of participants (minimum 6)
- Location, logistics, facilities
- From their side:
- 1 day of preparation, playing and evaluation (without travel time) per person
- Time to implement the experience

- From our side:
- 1 day of preparation
- 1 day of playing and exhaustive feedback
- 1 day of evaluation, and how to implement the game experience