



QRA in perspective

What have we learned and what are we doing with it?

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QRA is a referee in location based risk

- Continuing tension between transport of dangerous goods and spatial development
- Neither of the two is going to 'just' disappear
- Risk as costs \leftrightarrow benefits analysis, where risks are the costs and transport is the benefit
- Location-based risk draws a boundary

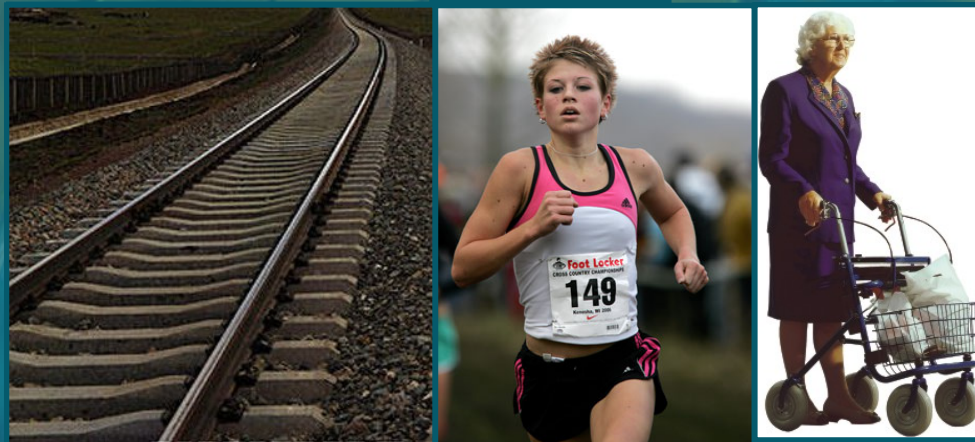
QRA is help in Societal Risk

- Societal risk cases are very complex
- QRA is just a small part of the whole
- Other spatial (planning) options
- Ability of people to rescue themselves
- The appropriate measures
- Controllability of the situation

Other options (1)



Other options (2)



Who are the stakeholders?

- Spatial planners
- Model software developers
- Emergency services
- Competent Authorities
- Infrastructure manager
- Transport companies
- QRA instrument manager
- Civilians
- QRA 'performer'

Model software developers

- Clear protocols
- Clear assignments

QRA-instrument manager

- Clear protocols
- Incident registration
- Characteristics of substances (International Databases)
- Volume and nature of dangerous goods transports
- Clear entries for others to ask questions and submit proposals (clear protocol)

Emergency aid

- Effects!?
- Knowing about the scenario that is used in the models
- 'Probability is always 1!'



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Infrastructure manager

- Cost Benefit analysis
- Exploring possibilities of the railway concerning transport of dangerous goods
- Comparing different routes

Transport companies

- No restrictions on the volume of transport
- Insight in the models, to manipulate

Civilians

- Clear information
- Use and necessity of transport
- Participation

QRA 'performer'

- Standardized data and ways of calculating
- Get input for the calculations (easily)
- Clear protocol what to do when the software can not 'answer' the question
- A well-functioning software programme

Spatial planner

- Standards (what should I do or not do?)
- Better tools to include external safety and QRA in a design
- Toolbox for handling (and avoiding) dangerous situations

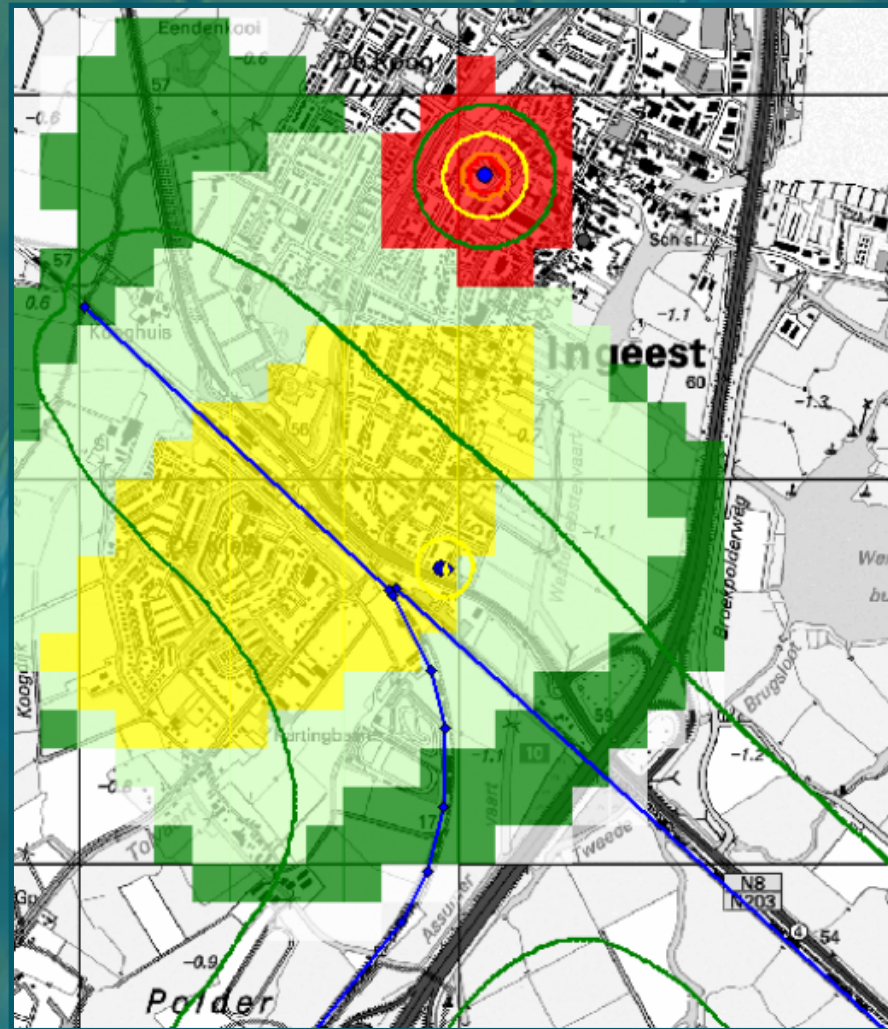
Competent authorities

- Univocal advice
- Room for own policy
- Results that they can communicate
- Political support

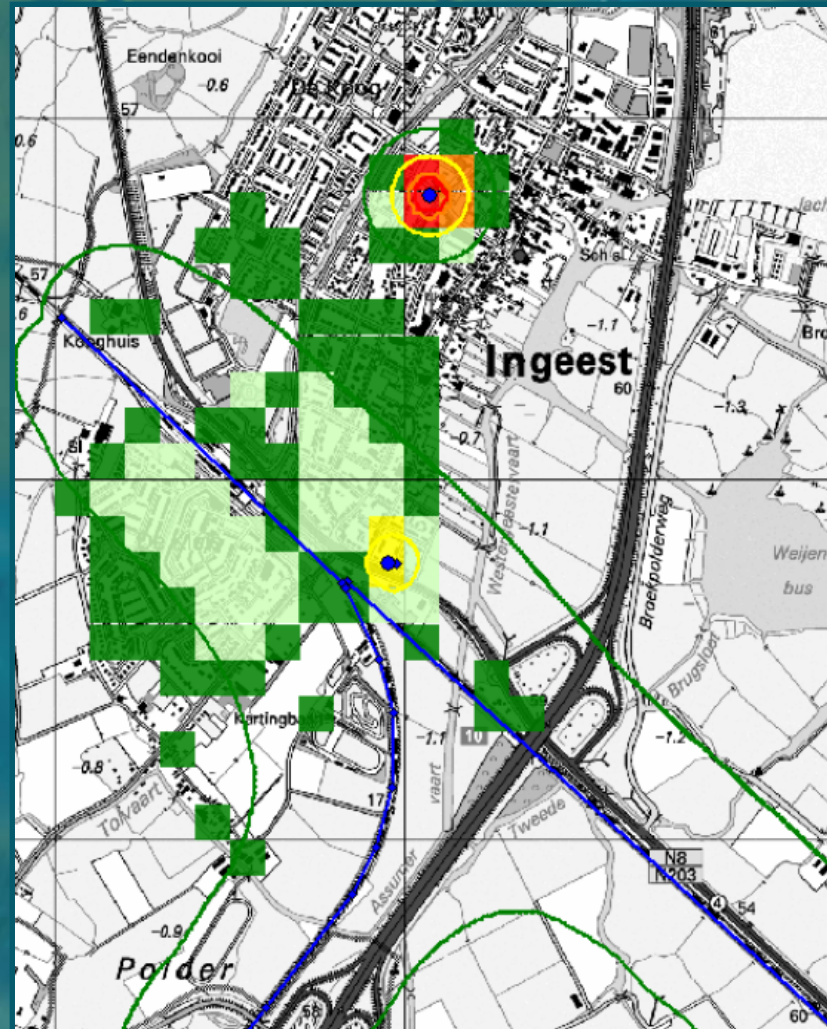
What is NL doing?

- National Population Database
- Societal risk on a map
- Counting the transport of dangerous goods on main roads
- Investigating the desirability and possibility of harmonising the effect approach (emergency aid) and the risk (probability) approach
- Courses on how to deal with external safety and QRA
- Guidebooks and websites
- Research: "Quantifying safety measures for QRA"

Societal risk on a map (1)



Societal risk on a map (2)



National Population Database

- By the Ministry of Housing, Spatial Planning and Environment (together with other ministries)
- Information on the population of the Netherlands is gathered, stored and made available for QRA
- Consistent results
- Next to the spatial planners other parties want to use this for other purposes