Working towards Climate Resilient Highway Infrastructure in The Netherlands

International Conference on Surface Transportation System Resilience to Climate Change and Extreme Weather Events

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Content

• Dutch history of dealing with extreme weather events
• Dutch policy for adapting road infrastructure to climate change
• Concrete actions towards resilient road infrastructure
• Challenges for the near future
The Netherlands, shaped by nature, storms and man
1953 flood > Delta Works & Delta Programme

‘the sea is a dangerous friend’
(spokesman of a Waterboard)
59% of The Netherlands liable to flooding, below water level

National highway network in 2013, with differentiated speed limits (daytime)
High level of water protection challenged by climate change

Recent examples of flooding, pluvial flooding and insufficient water discharging due to heavy showers and long periods of rain (July – August 2015)
Climate adaptation of highway infrastructure

Why:

• Climate change is a threat to responsibility of Rijkswaterstaat* for safe and fluid traffic (among other things ...... dry feat, sustainability)
• Future damage can be prevented by taking measures now with relatively low costs
• Support by Government policy

* Rijkswaterstaat is the executive organisation of the Ministry of Infrastructure and the Environment
Government policy on Climate Change Adaptation

Delta Programme
- safety, fresh water
- spatial adaptation
- adaptation of vital sectors

Climate agenda - mitigation and adaptation

National adaptation strategy (due March 2016)

(also) following from European policy
Delta Programme

Delta Decision on Spatial Adaptation
- Issues are flooding, drought, heat stress
- Netherlands climate proof and water robust in 2050
- In 2020 this is part of policy and actions
- By 2050 vital and vulnerable functions resistant to flooding
National Adaptation Strategy

Adresses:
• Water domain
• Infrastructure and transport*
• Spatial domain
• ICT, energy, health
• Agriculture, nature, fishing
• International policy

* roads, waterways, railroads, airports, pipelines, electricity, gas, telecom, drinking water, etc.

Goals:
• Coherent preparation for climate change
• Decrease vulnerability, increase resilience
• To be front runners in the EU
Concrete actions for resilient road infrastructure

- Investigation of Blue spots and following
- Guidelines for climate in impact assessment (SEA and EIA) – pilot projects
- Adjusting Guidelines for water discharging
- No regret measures (maintenance, porous asphalt)
- Knowledge development - national and international
Investigation of Blue spots and following

- Assessment of vulnerability to flooding, due to failing of levees and extreme precipitation
- The risk of flooding is assessed - possible damage and availability for evacuation

Road flooding by normative showers now (blue) and in 2050 (red)
Vulnerability of road elements and road embankments
Guidelines for climate in impact assessment

Goal
• help Rijkswaterstaat to deal with climate
• in an effective way
• and to meet with the climate policy

4 pilots
• investigate need to take into account climate
• Assess impact on planning process (time, costs, capacity)
• and cost of building project itself
Adaptation measures

For extreme rain:
- Maintenance
- Design of roads
- Traffic management
- Change Guideline for rain water discharge
Adaptation measures

For heat:
- Reduce traffic
- Porous or other asphalt
- Cooling structures
Challenge for the near future

Concrete implementation in projects, integrate into daily operation, stimulate by:

• Awareness among staff etc.
• Add climate adaptation on key moments
• Cost effective and no regret strategies and measures
• Cost benefit analyses
• Relate to maintenance planning and asset management
• Join with spatial planning and work together with other transport modalities
More information

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