



XXVIITH WORLD
ROAD CONGRESS
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RESILIENT PAVEMENTS

MARGO BRIESSINCK

SENIOR ADVISOR, CHAIR OF TC 4.1 PAVEMENTS

AGENCY FOR ROADS AND TRAFFIC, BELGIUM



Vlaanderen
is wegen en verkeer

FIVE TASKS... NINE DELIVERABLES

1. Use of recycled materials in pavements
2. Innovative pavement maintenance and repair
3. Road monitoring based on Big Data
4. Measures for improving resilience of pavements
5. Carbon footprint for road pavements

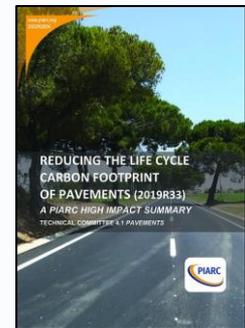
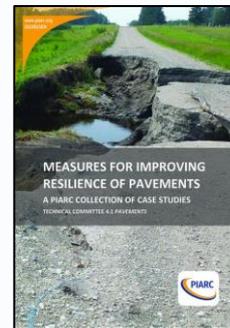
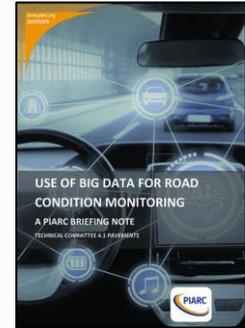
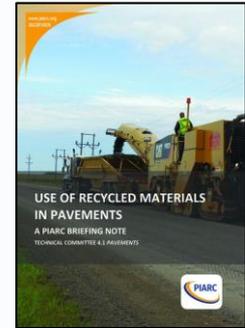
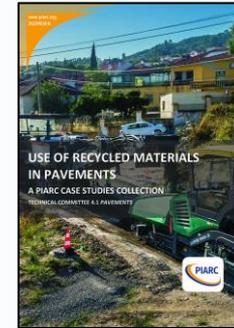
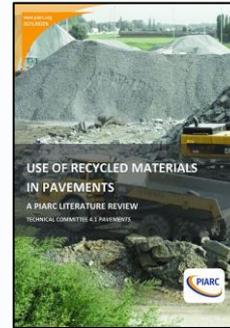




foto: nieuwsblad.be © Kurt Desplenter



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foto: www.schuttevaer.nl



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DEFINITION OF RESILIENCE



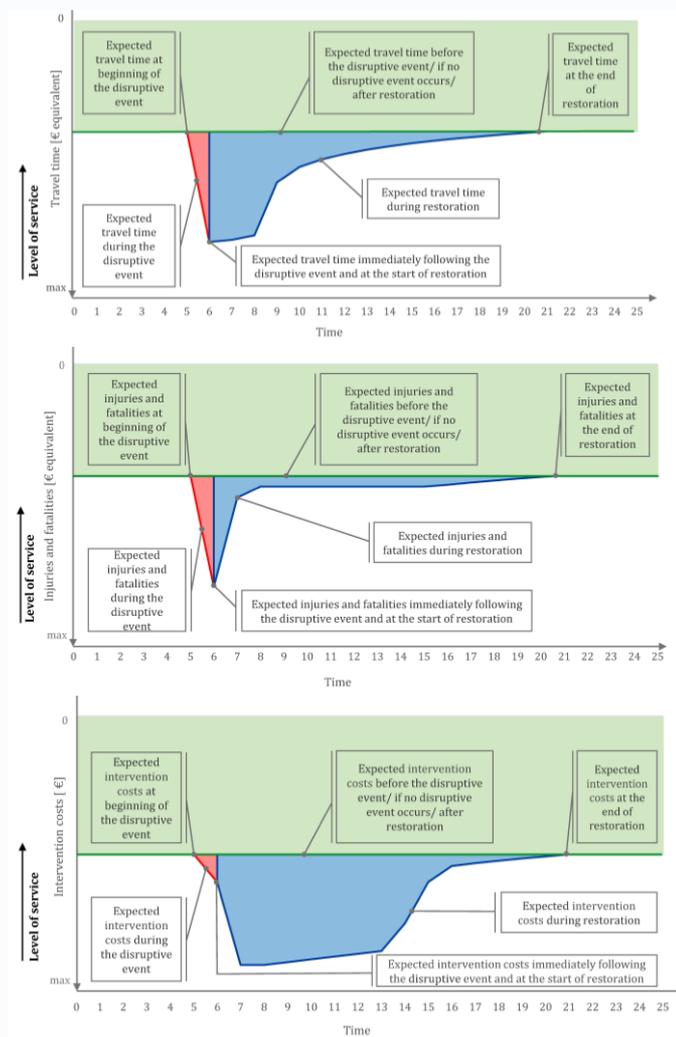
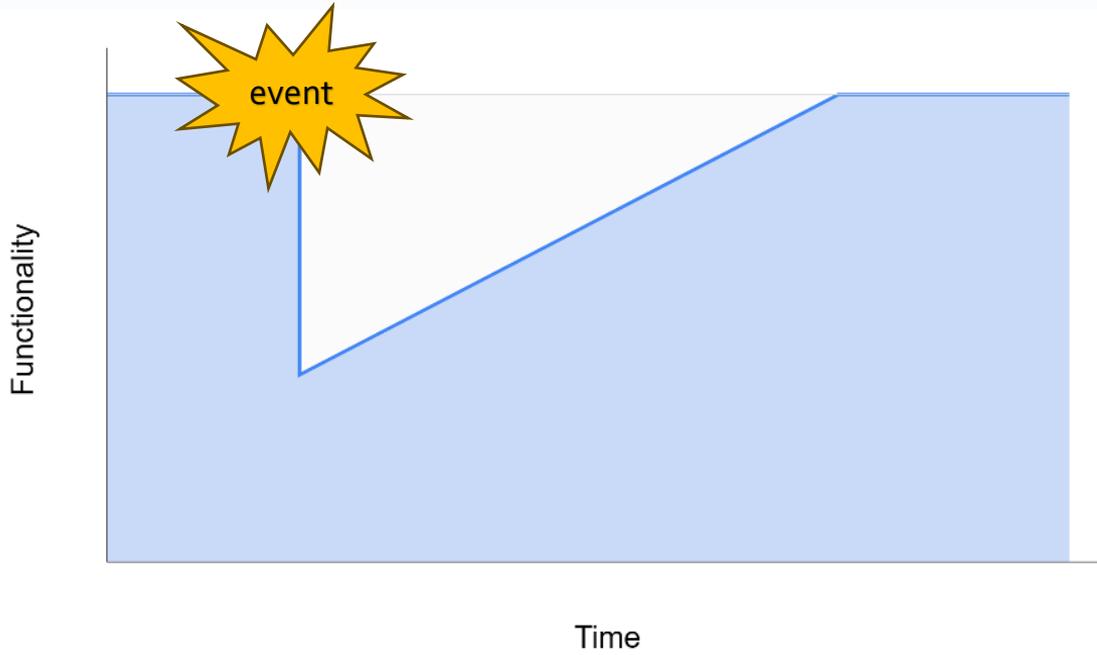
The ability of a system, community or society exposed to a hazardous event, a trend or a disturbance, to resist, absorb, accommodate, adapt to, transform, learn and recover from the induced effects in a timely and efficient manner that maintain their essential function, identity and structure.

The ability of a pavement or a road to resist to or recover from the effects of an hazardous event.

TWO PERSPECTIVES



FUNCTIONALITY CURVE



CLIMATE CHANGE INDUCED STRESSORS

- increase in temperature
 - lower stiffness of asphalt layers
 - change in visco-elastic properties of bituminous pavements
 - ageing of bitumen
 - higher stresses in concrete pavements
- increased exposure to water
 - reduction of bearing capacity
- longer periods of drought
 - shrinkage of soil or (unbound) base layers
- changes in freeze–thaw cycle patterns

MEASURES TO MAKE PAVEMENT MORE RESILIENT

INCREASE IN TEMPERATURE

using modified binders

using harder binders

using ageing-resistant materials

using special asphalt mixes

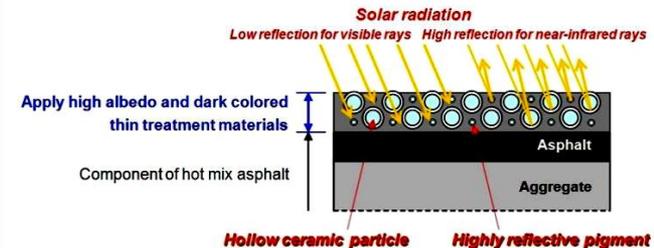
using concrete overlays

include expansion joints in JCP

reduce temperature

- using high-albedo aggregates
- using a light coating
- using phase-change materials

design with adapted fatigue laws



MEASURES TO MAKE PAVEMENT MORE RESILIENT

INCREASED EXPOSURE TO WATER

using permeable structures
using bound base layers
using concrete pavements
taking into account major
flood events in the design of
the drainage system



MEASURES TO MAKE PAVEMENT MORE RESILIENT

LONGER PERIODS OF DROUGHT

infiltration or buffering of rainwater

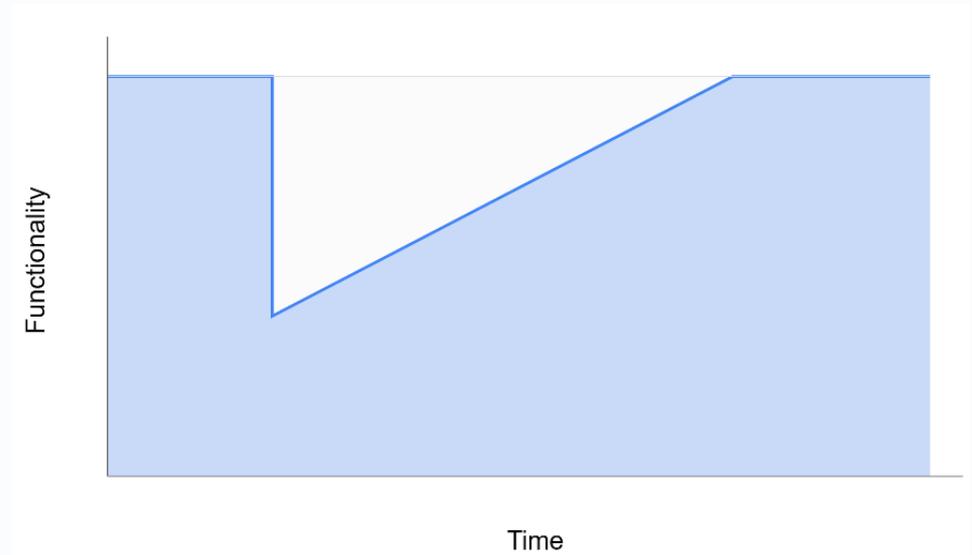
replacing or stabilizing the subgrade



CONCLUSION : THINK THE UNTHINKABLE

Measures:

- design
- materials
- network level



THANK YOU FOR YOUR ATTENTION... QUESTIONS ?





MARGO BRIESSINCK
SENIOR ADVISOR, CHAIR TC 4.1 PAVEMENTS

Tel: +32 499 94 93 15

Email: margo.briessinck@mow.vlaanderen.be

Website: <https://wegenenverkeer.be>



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<https://www.linkedin.com/in/margo-briessinck-6652a459/>