Adaptation of the Road Infrastructure to Climate Change

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Introduction
As a consequence of climate change, extreme weather events such as storms, heavy rainfall and heat waves will increase and the road transport infrastructure has to be adapted to them. Thus the Federal Government of Germany passed the “German Adaptation Strategy to Climate Change (DAS)” and the “Action Plan to the German Adaptation Strategy to Climate Change”. The aim of the strategy is to create a national framework for action in order to prevent or minimize the adverse effects of climate change on the public, the natural habitats and the national economy.

Adaptation strategies to climate change
In 2009, the Federal Highway Research Institute (BASt) initiated a series of research projects related to climate change and developed an adaptation strategy. This strategy was implemented through a research program called “Adaptation of the Road Infrastructure to Climate Change (AdSVIS)”.

Projects: finished
Impacts of climate change on road maintenance
Adaptation of pavement designs for asphalt and concrete constructions
Standardized asphalt pavements due to changing temperature boundary conditions

Projects: ongoing
Cross-linking of the AdSVIS projects
Development of climate impact models and design parameters for bridges and tunnels
Comparison of meteorological parameters near federal roads and grid data of climatologic prediction models
RIVA - Risk analysis of key goods and transit axes including seaports
Development of a model for estimating landslide risk areas and development of a national hazard map
Evaluation of the design of road drainage systems regarding climate change

Projects: planned
AdSVIS server
Inventory of road drainage systems in selected sections of the TEN-T
Impacts of weather extremes on concrete road pavements
Vulnerability analysis of bridges and tunnels
Analysis of measures to reduce the vulnerability of bridge and tunnel structures
Asphalt pavements and extreme temperatures

The AdSVIS-projects
Currently, AdSVIS consists of 15 projects, of which the project “RIVA - Risk analysis of key goods and transit axes including seaports” is the most important one. The aim of RIVA is the development of tools for the identification, analysis and assessment of risks due to the expected climate change. This way, risks for the infrastructure could be reduced and mitigated. Other projects of the AdSVIS program concern the adaptation of guidelines to climate change, in particular the adaptation of pavements and the design of drainage systems.

International cooperation
The Federal Highway Research Institute (BASt) in a leading role is also involved in several international programmes like “The Climate Change Resilient Road” in the Forever Open Road programme or in the CEDR call 2012 “Climate Change - Road owners adapting to Climate Change”.

*Milestones of the BASI roadmap to the adaptation of the road infrastructure to climate change

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