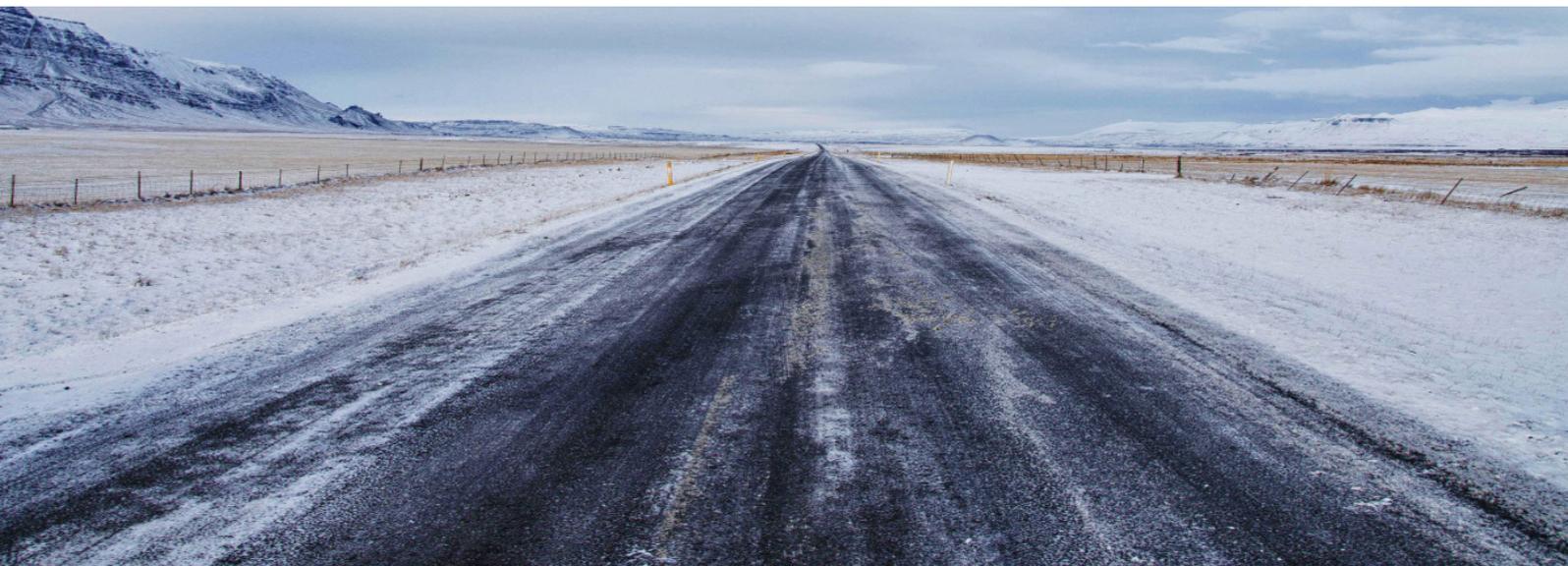


Roads and Climate Change

Integrating climate change aspects
into road network development

August 2018

JASPERS - Roads Division



A sector exposed

Roads are at the heart of the climate debate, both as a source of greenhouse gas emissions and as assets exposed to climate change risks. The past decade has seen, for instance, multiple cases of floods flushing road sections away and heat waves making concrete pavement joints burst in many locations across Europe.

New questions are now emerging for road infrastructure managers: How vulnerable are roads to extreme weather events? What can be done to make roads more climate-resilient? Which parts of the network are most exposed? Are existing design guidelines adequate? What cost-effective responses can be implemented?

Issues like these can be addressed with an approach referred to as Climate Resilience Analysis for Road Networks, which JASPERS can help road authorities to implement.

Mitigation and adaptation

Roads make a vital contribution to economic development and growth, and bring important social benefits. Road authorities are, therefore, mandated to ensure adequate mobility service levels, including safety and reliability. Climate change can thwart these efforts, with knock-on effects on both society and the economy. According to European research (for instance the WEATHER and EWENT projects), the costs of extreme weather events affecting road transport amount to billions of euro each year.

For this reason, road authorities around the world are gradually recognising the climate threat and progressively considering it at all stages of the project cycle. Major projects to be co-financed by the European Union during the 2014-2020 programming period are required to integrate climate change considerations.

Acting on climate change should involve both mitigation (reducing greenhouse gas emissions) and adaptation measures (lowering vulnerability to the inevitable). Climate Resilience Analysis for Road Networks focuses on adapting road networks to climate change hazards. JASPERS can assist road authorities on all of these matters.

What is Climate Resilience Analysis for Road Networks?

Climate Resilience Analysis for Road Networks provides road managers with:



An overview of the vulnerability of the road network to climate change hazards:

- The criticality of roads and their sensitivity to climate change hazards, based on experience
- The exposure of roads based on knowledge of the recent past and climate projections
- The capacity of road networks to cope with climate hazards, including considerations about resilience, redundancy and repair



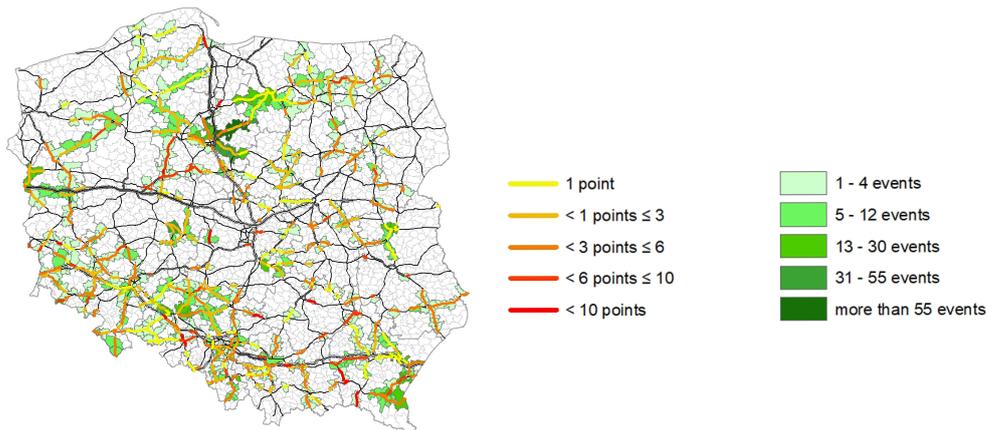
Tools to:

- Adapt design practices for new roads
- Plan maintenance and adaptation measures for the most exposed existing roads
- Manage rapid intervention and restoration actions

Institutionalising Climate Resilience Analysis for Road Networks requires:

Continuous climate change awareness	Political and managerial decision-making and commitment	Allocation of resources (staff and equipment)	Definition of procedures	Enhanced communication and knowledge sharing
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The process of Climate Resilience Analysis for Road Networks



Mapping of extreme weather events and impact levels on Polish national roads managed by GDDKiA (2004-2016)

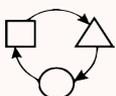
JASPERS' advisory offer on roads and climate change

JASPERS has advised on the preparation of climate change assessments of numerous major projects in many European countries and across all sectors, notably including roads.



Mitigation

- Methodological advice on emissions calculation
- Guidance on other climate change mitigation aspects during roads project preparation, including strategic planning, feasibility study and design



Adaptation

- Support in the identification of climate hazards
- Guidance on climate change vulnerability and risk assessments
- Guidance on the identification and prioritisation of adaptation responses
- Capacity building for Climate Resilience Analysis for Road Networks

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[2] Wojtowicz J. & Łutczyk G. - Adaptation to Climate Change for National Roads in Poland – Analysis of key weather factors affecting the national road network, February 2018.

[3] JASPERS - The Basics of Climate Change Adaptation, Vulnerability and Risk Assessment; June 2017. <http://www.jaspersnetwork.org/plugins/servlet/documentRepository/displayDocumentDetails?documentId=381>

“ Adapting effectively and efficiently to the inevitable consequences of climate change should be part of modern road management. This is precisely what the climate change adaptation strategy of the National Polish Road Administration GDDKiA will propose, based on the Climate Resilience Analysis for Road Networks performed with JASPERS’ advice.”

A. Waclawiak, Head of EU Projects Unit,
GDDKiA (National Polish Road Administration)

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