



## **Impact of adverse weather related events on terrestrial transportation lines**

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Transportation is an important component of a society to maintain its functions and its economic and social development. Many different types of adverse weather conditions challenge transportation networks, such as e.g. storms, intense precipitation, extreme temperatures, as well as weather related hazards like floods, erosion, landslides, and forest fires. Negative impacts include accidents, damage to infrastructure or to components of the infrastructure, delays and malfunctioning of the transportation network, resulting in economic consequences. Climate change is anticipated to lead to an escalation of such negative impacts if no counter-measures are taken.

The tools applicable for impact and risk assessment of terrestrial transportation lines encompass a wide variety of methods. Hazard specific methods assess the interaction between the hazard and the infrastructure through, e.g. fragility functions, statistical and empirical approaches, probabilistic analyses and fault-tree assessments. Other methods focus on the consequences of the malfunctioning transportation network for society, such as economic theory based approaches and simulation techniques for assessments of the dynamic behavior of infrastructure systems.

Ongoing work consists of establishing of a general work-flow for impact assessments of adverse weather related events affecting terrestrial transportation lines. The first step is to identify modes of malfunctioning or degradation of the infrastructure caused by different weather related events, such as, e.g. blockage of the transportation line, damage or degradation of structural elements, as well as conditions leading to reduced mobility or lack of mobility. The next step is to define adverse weather related events (e.g. defined by thresholds for meteorological parameters), and to assess their frequency. A review of hazard maps for weather related events at a European level has been performed and amalgamated in an overview report. Prior to modelling of the specific impacts, impact categories need to be determined. In this work, special attention is paid to models for assessment of impact on mobility, represented by the degree and the duration of the service loss and on models assessing direct material impacts in terms of repair and maintenance costs.

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