



Estimating the impact of wintry weather on transportation in Europe

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Wintry weather conditions have high impact on transportation. Sub-zero temperatures combined to snowfall result in traffic jams and increased accident rate. Dense snowfall causes poor grip between the road surface and tires and reduces the visibility, thus increasing the risk for severe pile-ups on highways. Low temperature and snowfall have a strong negative impact also on railway traffic and aviation, as experienced in Europe during winter 2009/10. Many big airfields in Central Europe were closed during several days and thousands of people had to spend the night at the airport or in the hotels nearby. The estimated total costs from a single major snowfall event can climb up to 1.3 billion pounds (1.5 billion euro), as happened in UK on 1-2 February 2009.

By investigating the effect of hazardous winter weather conditions on different transport modes the worst situations can be identified and impact thresholds for different weather parameters and their combination can be assessed. In this study we estimate the impact thresholds for snowfall, wind gust and temperature as well as for their combination, the blizzard. This work is based on an impact review collected from literature and media reports as well as on local studies concerning the link between snowfall and traffic accidents for example. From the study on six winters it appears for example that a snowfall of 10 cm/24 h resulted in a double car accident rate on average in southern Finland. Such situations can be regarded as high impact cases (peak days of traffic accidents).

It is estimated that climate change and global warming will decrease the average yearly number of wintry days in Europe. Even the northern part will probably have a shorter period of snow cover during the coming decades. However, the variability between different winters will remain and cold air outbreaks with even heavy snowfall can occasionally occur also during mild winters. Several studies have shown that the more uncommon some hazardous event is, the more disruptive it can be to the society. This study, where we assess the impact thresholds for different weather parameters, will give guidelines for calculating the probabilities of hazardous wintry events in Europe at present and in the future.

This study is associated with the EU/FP7 project EWENT. The objective of the project is to study the impacts of hazardous weather on European transportation system by taking into account the changing climate.