
Summary

Climate change affects traffic and transport

As this report shows, climate change is set to affect traffic and transport. Examples of how this might happen include: more ruts on roads, more frequent jamming of bridges and sluices, and further sailing restrictions for inland shipping. Most of these effects are already present in our current climate, albeit to a lesser extent. As a result, existing policy can be used to respond adequately to the effects of climate change on traffic and transport. Supplementary adaptive measures are to be studied for a number of effects which are expected to occur in a more intensive, protracted and frequent manner. A favourable characteristic of traffic and transport is its considerable capacity to adapt. The life span of a lot of infrastructure elements, such as the road surface, is such that future climactic conditions can be taken into account in the event of replacement or new construction work.

Increased focus on the effects on spatial planning

There is currently a broad policy focus on the effects of climate change on the spatial layout of the Netherlands, guided largely by the possibility of a different approach to water management as a result of climate change. In comparison, a lot less attention is paid in this line of policy to the immediate effects of climate change on traffic and transport. Nevertheless, a start has been made, as this study highlights. As the manager of roads and waterways, the Directorate-General for Public Works and Water Management (Rijkswaterstaat) has had a number of studies carried out into the effects of climate change on infrastructure and is adjusting its policy accordingly. The managers of airports, seaports and railway infrastructure are currently familiarising themselves with the necessary steps.

The context of the study

This exploratory study is a response to the need of the Directorates-General for Passenger Transport (DGP) and Transport and Aviation (DGTL) (Directoraten-Generaal Personenvervoer en Transport en Luchtvaart) of the Ministry of Transport, Public Works and Water Management (Ministerie van Verkeer en Waterstaat, V&W) to be able to ascertain whether any or additional policy measures are needed in order to adapt traffic and transport to climate change in time.

Climate scenarios

This study was based on Royal Netherlands Meteorological Institute (KNMI) estimates regarding the way in which climate change is set to develop. Traffic and transport are particularly affected by extreme weather conditions. According to KNMI scenarios, such extreme weather conditions will become more commonplace. For example, the number of days in De Bilt classed by the KNMI as tropical is expected to increase from four in 2006 to between seven and fourteen days per

year in 2050. The number of ice days is expected to decrease from ten now to between two and six days per year in 2050. The frequency of wet days is set to decrease in the summer and increase in the winter.

Policy implications

This report describes the observed effects of climate change on traffic and transport and the possible measures which have been and are being taken, either wholly or in part. The most important policy implications are:

- The possible adverse effects of climate change on sub-infrastructure (increased water discharge, subsidence, desiccation), and what can be done about these, are being studied by the Directorate-General for Public Works and Water Management in the context of roads. The level of knowledge (e.g. regarding costs and effects) is not yet sufficient to determine precisely which approach is the best. ProRail and Schiphol are able to apply the knowledge that the Directorate-General for Public Works and Water Management has to their own infrastructures. The government could play a role in improving the transfer of knowledge and cooperation between managers of traffic infrastructure.
- Research into measures which could be used to manage the effects of climate change on the superstructure of roads and waterways has already been arranged with the Directorate-General for Public Works and Water Management. Schiphol is going to initiate this research. ProRail does not have any concrete plans for rail infrastructure.
- More intensive rainfall (leading to congestion and submerged infrastructure) will have a negative effect on the availability of all forms of infrastructure. These effects are temporary and, balancing out the more intensive rainfall, there will be less snowfall and less freezing in the winter.
- Climate change will cause larger and more frequent variations in river water levels, which could obstruct the goal to increase the scale of inland shipping. At the same time however, it could help to accelerate technological development in the inland shipping sector. The sector is aware of the possible effects of climate change and is analysing possible solutions. On the one hand, the government can restrict itself to monitoring developments in the sector. On the other, it can focus (and already does so) on a different approach to water management.
- In the case of road infrastructure, electronic information (and other) systems are resistant to extreme weather conditions. A closer examination of electronic systems for the railways needs to take place, however these initiatives are not yet being implemented.
- Weather warnings ('stay inside' [blijf binnen] alerts) are already being applied in the Netherlands. The effects of climate change in the long run (i.e. greater extremes) may offer grounds for the government to encourage the KNMI and managers of infrastructure (road, rail, airports and seaports) to research whether the types of weather warnings currently used need to be adapted. A link exists between this and the electronic systems referred to above.

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- As regards understanding of the effects of climate change on spatial planning, 2008 is going to be an important year due to the publication of the policy documents resulting from the Programme for Spatial Adaptation and Climate Change (Adaptatie Ruimte en Klimaat, ARK) and Water Safety in the 21st century (Waterveiligheid 21ste eeuw). The effects of different spatial planning on traffic and transport will then become clear.

This research into the effects of climate change could be repeated after some years, at which time new studies by the KNMI will be available (for example, into the effects on microclimate) and there will be more information available in the policy documents on spatial planning and water management about the effects on traffic and transport.