

## **Results of Towards a sustainable multimodal freight transport system for the Randstad**

In the past decades, freight transport has become a visible, if not intrusive part of life in the world's big urban regions like the Randstad. In the future, its growth will outrun that of passenger transport. More and more, dedicated policies and projects are needed to accommodate freight flows, to reduce growth where it can be avoided and to cope with its negative effects. If freight growth is not curbed, or the effects of growth are not mitigated, in the future, regions will be less accessible, goods will not arrive at consumers, and environmental pollution will increase further. The main policy questions that the research has addressed were the following:

- What are the logistical needs of the companies that use the Randstad infrastructure now and in the future, in various growth scenarios? What if this growth cannot be accommodated?
- What facilities need to be developed in terms of multimodal infrastructure and services, to comply with the needs of both users and non-users of the freight transport system?
- Which public policies can secure the delivery of goods to the Randstad cities, given the existence of many stakeholders and their conflicting views?

In order to develop strategies for future freight systems, computer models are needed to picture the future, to be able to anticipate on possible problems and to test alternative solutions. In the past, models for freight transport were limited in their representation of logistics structures such as distribution centers and intermodal transport chains. This meant that models mostly recognized the perspective of scientists, and much less so that of logistics stakeholders. The main objective of our research was to enrich these models and add more logistics processes that determine freight transport flows.

The scientific results of the research included the following:

- New databases on freight flows where the influence of ports and cities can clearly be distinguished.
- New models that allow to test the effects of investments in transport network infrastructures and services, combining different modes of transport.
- New models that show how logistics activities add to urban sprawl around cities, and how these spatial developments respond to pricing policies.
- New methods and techniques to develop serious games that allow industry, government and citizens to negotiate new logistics concepts for delivery of goods to cities.

The models were applied for the Netherlands, the Randstad and the main port city of the Randstad: Rotterdam. Some models were also tested on databases at the European level and from other countries within and outside Europe. Several policy-relevant findings emerged, including:

- The notion that there seems to have been an overinvestment in intermodal freight terminals in the Netherlands.
- Insight into the responsiveness of spatial development to transport costs.
- The result that with a considerable tax on road transport, CO<sub>2</sub> savings of 20% may result due to a shift of freight from road transport to inland waterways, and to a lesser extent to rail

The results of this scientific program were laid down in over 30 publications in scientific journals, books and PhD dissertations. The research developed has been adopted by the Netherlands Ministry of Transport and the Environment as part of their roadmap for freight model improvement. The research team co-operated with scientists all over the world and has seen a continuous exchange of experiences throughout the 4 years of the program. The integrating report about the program's achievements on a recent US conference of the Federal Highway Administration was awarded one of the two conference prizes, for the academic work that best took into account private sector perspectives.