TRANSBALTIC MEMO

On adaptability of the TRANSTOOLS model for macroregional transport flow analyses

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Briefly about the project

TransBaltic is a strategic project on transport and regional development, co-financed by the Baltic Sea Region Programme 2007-2013 and led by the Swedish region of Skåne. TransBaltic is regarded an important implementation tool for the EU Strategy for the Baltic Sea Region (BSR) in Priority Area 11 ('To improve internal and external transport links').

The project gathers 50 organisations from 11 countries around the Baltic Sea in an effort to make a contribution to the development of an integrated multimodal transport system in the BSR. One of the main project results will be a macroregional transport action plan, which will address internal connectivity, interoperability and intermodality constraints of the Baltic Sea Region from the sustainable regional growth perspective. It will also contain preparedness measures to enhance a gateway function of the Baltic Sea area for intercontinental freight flows. More information about the project is available at: www.transbaltic.eu.

Background

TransBaltic decided to employ the TRANS-TOOLS model in analysing the distribution of freight flows in the Baltic Sea Region according to a few alternative transport development scenarios. The output was expected to help identify critical areas and components of the desired integrated transport system, which would require particular policy-making attention. Thereby, TransBaltic would be capable of testing adaptability of such a model for the sustainable regional growth of specific macroregions, with road, rail and maritime networks put into simulations.

The choice of this particular model was determined by a necessity to deliver results comparable with the Baltic Transport Outlook study (BTO), a joint action of national transport ministries around the Baltic Sea (part of the European Union Strategy for the Baltic Sea Region), which also used TRANS-TOOLS for macroregional analyses. However, while the BTO adopted results of the modelling

process in a direct way, TransBaltic in some cases calibrated them to obtain more reliable results for the specific scenarios. This in particular refers to more realistic routing of the flows or shifts between transport modes along the given route. Also, the array of the scenarios and set of parameters applied was different.

Details about the development scenarios, relations with the BTO and outcomes of modelling analyses are presented in the TransBaltic Policy Report 2011 and the technical report on 'TransBaltic forecasts and scenarios for BSR corridor flows 2030', both available at: www.transbaltic.eu.

Model assessment

Notwithstanding the methodological determinations, the TRANS-TOOLS model was found unique to encapsulate the whole Baltic Sea area and use up-to-date databases, both for the freight and the passenger transport. The visualisation of flows in effect of observed development trends and realised infrastructural investments was hoped for to serve policy analyses contributing to the concept of green multimodal transport corridors. The macroregional scale and the sustainable regional growth context of the TransBaltic work put additional requests upon the model and the database, to be able e.g. to analyse modal shifts responsive to changes in EU and national transport policies or to reasonably distribute transcontinental freight flows to and from the Baltic Sea area.

The overall judgment by the TransBaltic partnership is that the TRANS-TOOLS model in its present form is not well suited to the regionalised and multimodal flow investigations. Its main asset is the ability to perform analyses within the given transport mode as it demonstrates fair or good quality of flow and network data in the administrative units, can decently simulate forecast year flows, and yields reasonable route choice for road or rail networks. It has also a rather good geographical coverage; although outdated information on infrastructure networks in Belarus made the model show main east-west flows in the future as circumventing this country via Latvia and Lithuania, which required manual adjustments. Further, as the model connects geometric centres of the administrative units (centroids) and not the real transport nodes, in case of territorially large regions in the northern part of the Baltic Sea Region the lines depicting flows to the ports (Narvik, Kirkenes and Murmansk) were abruptly ended in the very centres of the regions and had to be manually extended to the coast.

Major improvements are, however, necessary when it comes to freight analyses in the multimodal perspective. The TRANS-TOOLS model has been found to perform poor as regards the ability to

simulate 'behaviour' of commodities, terminal use and specialisation, mode changes in supply chains and freight policies at the EU, national and regional level. In the latter case, the model cannot meet the need to e.g. analyse impacts of the IMO Regulation on the flow volumes and distribution, with assumed backshift of cargo from sea to road transport.

The fundamental problem pertains to the forecasts of sea transport as the shipping network is not included in the TRANS-TOOLS model. Ferry services, which are of essential importance for the Baltic Sea Region transport development, due to the model constraints need to be split into road and rail ferry networks. A freight demand matrix biased to the transport costs and frequency (which may not work correctly), and not taking into account the carrying capacity, leads in some cases to unreliable projection with some ferry connections resembling rather fixed links than a ferry line with one-two daily departures. In consequence, we saw future rail-borne flows from the Black Sea ports to Scandinavia automatically detoured via the rail network in Poland, Germany (Sassnitz) and Denmark, instead of Klaipeda and Gdansk/Gdynia. Thus, in order to give more reliable route choice, the flows needed to be manually 'broken' from rail to road (intermodal) in the pairs of ports they actually cross.

Another challenge relates to the capacity issues in the land network matrices. While the road transport data include congestion, it is not featured among parameters for the rail network. This may significantly underrate the bottleneck effects in the transport network.

Finally, despite a recent initiative to integrate intermodal terminals in the TEN-T policy (cf. European Commission's Proposal for a Regulation of the European Parliament and of the Council on Union guidelines for the development of the trans-European transport network, COM(2011) 650/2), data on such facilities are not yet fed into the planning models. In effect, scenario development efforts and strategic analyses for terminals as components of the integrated transport network need to rely on intuitive estimations, and those in turn are based on fragmented interviews and discussions with those terminal owners who are willing to provide information.

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