PROJECT

TRANSTOOLS

Tools for Transport Forecasting and Scenario Testing

Funding: European (6th RTD Framework Programme)
Duration: Oct 2004 - Sep 2006
Status: Complete with results
Total project cost: €1,199,998
EU contribution: €1,199,998

Call for proposal: FP6-2002-SSP-1
CORDIS RCN : 87869

Background & policy context:

The policy environment is changing, in particular because of globalisation (increasing mobility of people and goods; communication technologies), the rising importance of the knowledge economy, high energy prices and the new Europe (of 25+). Transport scenarios and other tools used for the impact assessment of policy proposals will have to take all these recent and emerging trends into account. The current European transport network models have shortcomings.

The main shortcomings are:

- the unsatisfactory representation of mix of traffic (short/long distance and freight/passenger);
- the (partly) missing presence of intermodality and freight logistics in models;
- differences in implementation of Origin-Destination base year for freight traffic in some models;
- outdated character of some models;
- no sufficient linkage of network based transport models with socio-economic effects and external effects.

Objectives:

TRANS-TOOLS aimed to produce a European transport network model covering both passengers and freight, as well as intermodal transport, which would overcome the shortcomings of existing European transport network models. The objective of the project was to build on the experience of existing transport models and implement a number of improvements that would be the basis of the development of an integrated policy support tool for transport at EU level.

As a result, the TRANS-TOOLS model was expected to include the following innovations:

- new set up of a demand/supply model;
- intermodality for passenger/freight (as National and European transport policies seek to promote intermodality through different measures);
- inclusion of intercontinental flows (mainly for freight), as some models do not cover this segment;
- full coverage of Central and Eastern Europe (Accession Countries and the countries at the borders of the enlarged European Union);
- integration of the new Member States at a level similar to those of EU 15;
- feedback infrastructure development economy (as the question of indirect effects in the economy and on network level is important, especially where investment has a substantial influence -
Methodology:

The aim was to develop a European network-based transport model starting from the ideas consolidated in the modelling experience of the consortium partners. Some features of the current EU models were added, considering that while the model could not be a tool for every purpose. The selection of the model features should be essentially based on the policy needs addressed by the European Commission. It was already quite clear that the SCENES model approach would provide good suggestions for the treatment of passenger transport and the interaction of local and long-distance traffic. The VACLAV transport network would be a suitable basis for the development of an efficient transport assignment model. Furthermore, the NEAC would provide the information for proper description of freight transport and the SCENES model would constitute a reference for the treatment of intermodal transport. Finally the SLAM model focused on logistics.

Finally, since in the European realm different models for different options and with different Intellectual Property Rights (IPR) settings were anticipated, it was useful to construct an IPR free instrument on the basis of the best available knowledge.

Parent Programmes:
FP6-INTEGRATING - Specific research and demonstration programme aimed at integrating and strengthening the European Research Area

Institute type: Public institution
Institute name: European Commission
Funding type: Public (EU)

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**Key Results:**
TRANSTOOLS has developed the largest and most comprehensive European transport model in terms of countries covered, population covered, and geographical scale. It covers all modes (cars, trucks, trains, canal ships, sea ships and air transport) as well as both freight and passenger transport. Furthermore the model is IPR (Intellectual Property Rights) free and general available, although it requires ARC-GIS and TRAFFIC ANALYST to run.

The model integrates existing models into one new model that comprehend the complexities of freight and passenger transport flows in the European Union in order to be able to assess large scale policy questions raised by the challenging environment of an enlarged Europe. This new modelling tool considers ETIS as the basis for assessing transport performances. The main modules of the TRANSTOOLS model are:

1. The TRANSTOOLS Freight Demand Module, which consists of the following sub-modules:
   - the TRANSTOOLS Trade Module, which uses the ETIS O/D freight transport matrix. Its output is a forecast O/D matrix for freight including origin region, in-between transshipments and destination region, as well as transport mode at origin, in-between transshipments and at destination, commodity group and tonnes.
   - the TRANSTOOLS Modal Split Module for freight transport based on the model in NEAC. It adjusts the stable modal split resulting from the Trade Model. Its output is the ETIS freight matrix (a forecast O/D matrix including forecast modal split).
   - the TRANSTOOLS Logistics Module. Based on SLAM, which is a module appended to the SCENES model, it evaluates the impacts of changes in the logistic and transport systems within Europe on the spatial patterns of freight transport flows, through changes in the number and location of warehouses for the distribution of goods. Its outputs are unimodal transport matrices used by the Assignment Module, and generalised and monetary costs per origin, destination and commodity type used by the Economic Module.

2. The TRANSTOOLS Passenger Demand Module which models passenger transport at European level focussing on the transport models SCENES, VACLAV, and ASTRA. Its output for the Assignment Module are unimodal passenger O/D transport matrices at NUTS3 level in number of passenger per mode and trip purpose, as well as in number of vehicles. Its output for the Economic Module is the level of service matrix with generalised costs per O/D relation.

3. The TRANSTOOLS Economic Module, which

**Technical Implications**

The Commission should be aware of the capabilities of the model and the way in which it can be integrated in the policy analysis.

The reliability of the model results depends on the accuracy of the information on the base-year and forecasting-year, which should be frequently updated. A user group with representatives of the Commission and Member States should be established.

The website should play a central role for disseminating the results of the project. It should contribute to the establishment of a modelling community. Furthermore the establishment of a Helpdesk would enhance the use of the TRANSTOOLS model.

Data requirement of the TRANSTOOLS model are linked to ETIS. The updating should make reference to ETIS-LINK and ETIS-BASE documentation. Passenger flow data of ETIS have been used for the model calibrating. It is recommended to make a new calibration every 5 years in line with the ETIS update timing.

The TRANSTOOLS model is based on the implementation in the TRAFFIC ANALYST, which has helped in making the relations between the different models explicit. From now on within TRANSTOOLS new modelling concepts can be easily implemented, as long as the format of the data files is followed.

The possibility to optimise software codes and data flows in order to reduce running times has to be studied (at present it takes about 3 days to run the model in full details), as well as the enhancement of its user friendliness.

The model can be improved by extending the network, estimating matrices for intra-zonal traffic, providing links to other models (e.g energy models, environmental models, etc.), including neighbouring countries (near Europe), improving the modelling of air and sea transport, including containerisation, enhancing links to the national models, including generation and attraction information, making model parameters changeable by the users. It is also important to check
matrices and consistency to EUROSTAT data. Some of the improvements and extensions will be addressed by FP& projects I-TREN, WORLDNET, and REFIT.

Documents:
- Final Report (Final report)

**STRIA Roadmaps:** Network and traffic management systems
**Transport mode:** Multimodal transport
**Transport sectors:** Passenger transport, Freight transport
**Transport policies:** Societal/Economic issues
**Geo-spatial type:** Other