

TRANS-TOOLS ("TOOLS for TRansport Forecasting ANd Scenario testing") is a **European transport network model** that has been developed in collaborative projects funded by the European Commission Joint Research Centre's [Institute for Prospective Technological Studies \(IPTS\)](#) and DG MOVE.

TRANSTOOLS 3 TURNED INTO THE 2ND YEAR OF RUNNING

The project has been up and running for more than 1½ year now. That means, we have submitted the first annual report and explanation of the use of resources to the EU Commission. This News Letter provides a brief status of the project after the first 18 months of the project.

SUMMARY OF THE WORK

The purpose of the TransTools 3 project (TT3) is to develop the third upgraded version of the European TRANSTOOLS model. After the first 12 months, the project itself was on track, only with few deviations from the expected plan – all of which were dealt with.

However, the project builds on data from the ETIS+ project – another EU-project – which is heavily delayed. This has not seriously affected the first year of work in TT3, but has delayed the following phases of the project. A further complication is that ETIS+ will not deliver all the expected data. Dealing with these issues is being settled with the EU Commission.

WORK PERFORMED SINCE PROJECT INITIATION

Within the first 18 months of the project, the Consortium focused on:

- Establishing project coordination structures, systems and procedures to ensure proper execution of the project framework;
- Development of the overall model design as well as sub-model designs;
- Preparation of data, including specification of data needs as well as clarification of access to adequate data of a sufficient quality;
- Data validation to secure sufficient quality of model base data;
- Base software development of sub-models.

Hence, work has been initiated on cross-cutting as well as sub-model specific activities and is on-going in parallel processes.

Overall model design

The TT3 model will consist of several sub-models (scenario generator, freight and logistics, passenger demand, traffic assignment and impact assessment models). The TT3 project will develop a flexible modelling framework linking all sub-models developed in the project into one complete modelling system.

In order to ensure a modular and flexible model implementation, the TT3 project will improve the overall structure of the TransTools modelling system in four areas:

- Model configuration
- User interface design
- Software architecture and data structure, and
- Documentation of process and results.

Work has initiated within the first two areas. The software architecture and data structure will be elaborated during the coming months of the project and the process and results will be documented towards the end of the project.

Model configuration: TT3 will include a set of pre-defined base configurations of the model. Users will be able to switch between the different base configurations without having to make any modifications while also retaining the full flexibility to create specialized configurations. In the first year of the TT3 project specific guidelines for TT3 sub-models have been developed in order to ensure that sub-model development will include the ability to adhere to configurations. How to improve the basis for model configuration is documented in deliverable D3.1 (submitted and approved by the EU Commission). Specific details of configurations will be developed at a later stage.

User interface design: The overall model logic in previous versions of the TT model was implemented in the ArcGIS Geoprocessing framework. Consequently, the user interface was also ArcGIS (mainly the ArcCatalog application). This provided users the flexibility to manipulate the model structure and its detailed composition as well as the precise sequencing of all of its individual steps. For non-experienced ArcGIS users, ArcGIS can be somewhat complex to get started with and there is a cost of roughly EUR 2.000 to acquire a new license to ArcGIS.

To alleviate these objections, TT3 will include two separate means of executing TT model runs. By means of: 1) An advanced user interface similar to the one used in previous TT versions and mainly targeting experienced users; 2) A simple user interface easier to operate for model users who are not experienced ArcGIS users.

The simple user interface will be a separate software program not embedded in ArcGIS. It will have a graphical user interface where users will be able to select and to run a specific scenario with a specific predefined model configuration.

The design of the simple user interface has been outlined in deliverable D3.2 (submitted to the EU Commission).

Sub-model design

Work has initiated on all TT3 sub-models: Scenario generator, freight models and logistics, passenger demand model, traffic assignment and impact assessment.

Scenario generator: The TT3 model does not forecast changes in economy, workforce and population needed in long term scenario forecasting. TT3 will however develop “boundary data” to be used using the model for forecasting, including population data, work force data, GDP data, car ownership, etc. In addition, the linkages to external models that can be used to estimate the external variables will be explored.

So far, definition of boundaries between the scenario generator and the various sub-models has been outlined and, based on a set of general criteria, one socio-economic model (CGEurope) has been chosen for further elaborations on possible links to TT3.

Freight models and logistics: Under TT3 a new freight model, based on 2010 data will be developed.

Since the freight model will be completely new, the design phase of the freight model has been relatively intensive. Activities included designing the freight model and identifying adequate data and discussions on how to link the freight model with the socio-economic models is on-going.

Passenger demand model: The TT3 project will re-estimate the passenger demand model from TT2, update the base year of the model and take nonlinearities into account.

In the first year of the project, focus has been on identifying disaggregated sources for model estimation and meta-data from national models and national studies.

Traffic assignment: TT3 will improve the route choice and traffic assignment component of TRANSTOOLS.

So far, the main effort has been to analyze the design of the traffic assignment models in TT2, and design the traffic assignment models in TT3 from a general

framework perspective in order to proceed at a later stage with the specific design of each traffic assignment model for each mode.

Since existing models will be used in TT3, the main effort in the TT3 project will be to calibrate these models once data from ETIS+ is available and an effort will be made on speeding up the calculation time with various techniques.

Data specification and availability

The TT3 project builds heavily on data from the ETIS+ project. An important objective in the early phases of TT3 is hence to validate ETIS+ data and to determine how they match the disaggregated level of detail defined for TT3.

Initial tests of ETIS+ data and preliminary work on data was planned to initiate during the first year of the TT3 project. However, the first preliminary data from ETIS+ was received later than expected and contained only a subset of the data expected. Moreover, the latest ETIS+ data received by TT3 have just been sent in late October 2012. Due to these delays, the planned TT3 exhaustive validation activities were not initiated as planned, although a process has already been designed to convert all the data released by ETIS+ in different formats (CSV, XLS, MDB, GDB, SHP, MIF) into a common database format in order to facilitate a global examination of the exact nature of the data prepared by ETIS+.

In these initial tests, we have been corresponding with ETIS+ to clarify the year their data refer to (not all of them are available for 2010, the expected reference year for TT3), the origin of the data (either observed, partially estimated or newly estimated) and the exact data source supporting observed data. Hence, so far, main activities regarding TT3 data specifications have been to coordinate and establish linkages with ETIS+ data structures and assess divergences between on the one hand, data we expected to receive and on the other hand, data that we actually received (final freight matrices have not yet been delivered).

In addition, the TT3 project has updated the geographical zone-system, including collecting geographical and socio-economic data from the member states and other European countries. Data collection for most countries is finalised.

Base software development of sub-models

Guidelines for model developers working on sub-models – in particular the passenger model, the freight model and the traffic assignment model – have been developed to provide guidance to sub-model developers on how they should include configurations in the model development.

At this stage of TransTools3, the ability of sub-models to adhere to configurations is much more important than specific details of configurations that may be changed later in the process.

For all sub-models it applies that they need to have at least three different level-of-detail configurations: “Fast”, “standard” and “detailed” with maximum running time defined and specifications with regard to simplifications.

RESULTS ACHIEVED AND EXPECTED RESULTS

The following formal deliverables have been accomplished and approved by the EU Commission:

- (D3.1) Guideline for model configurations
- (D5.1) Note with specifications for ETIS+.

The User Interface design documentation (D3.2) has been submitted to the EU Commission and awaits its approval.

POTENTIAL IMPACTS AND USE OF RESULTS

The main impacts – when the model has come into use - are expected as follows:

- The project will validate data on transport from ETIS+, and collect data from other sources, compile and merge them into a joined database that describes transport in Europe. This provides a general knowledge on transport in Europe. All data will be available in an IPR free format, whereby it can be of use – not only to DG MOVE – but to member states, transport organisations, NGO’s etc.
- TT3 can be used for assessing impacts of overall European Transport Policy, energy and/or fiscal/economic policies with focus on the transport sector, as well as evaluation of TEN-projects and other infrastructure projects.
- TT3 can also be used for evaluating large-scale national and interregional projects beyond the trans-European transport network.
- Finally, TT3 can be used in the context of national transport models – in cases/countries where no national model exists, as a base for developing

national models, or in order to describe international traffic to/from and through countries, especially in countries with much international transport or in border regions.

THE CONSORTIUM

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Royal Institute of Technology	Sweden
Rapidis	Denmark
Tetraplan	Denmark
University of Oxford	United Kingdom
National Technical University of Athens	Greece
John Bates Services	United Kingdom
Swedish National Road and Transport Research Institute	Sweden
Nouveau Espaces de Transport en Europe Application de Recherche	France
ETH Zürich	Switzerland
University of Belgrade	Republic of Serbia
FÓMTERV Zrt.	Hungary
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