lightness · speed · precision · visibility · multiplicity · consistency Six memos for the next millenium, Italo Calvino

Dcode

Scientific recognition for models

by establishing quality control procedures and deontologic codes for modelling

Mdir

Harmonised information about models

by establishing harmonised descriptions of transport models to be included in a common European Directory

GTF

Standard format for data exchange

by establishing a generalised format for data exchange between transport models

LTV

Visions to improve models' usability

by exploring long-term technical and organisational opportunities for models' integration into decision support tools

EUROPEAN COMMISSION

spotlightsTN

Keys to bring advanced transport models to light

RESEARCH FOR SUSTAINABLE MOBILITY

spotlightsTN

Keys to bring advanced transport models to light

spotlightsTN, a scientific forum for European transport modellers launched in January 2000 by EC/DG TREN to explore ways for making advanced transport models transparent to end-users and more integrated into policy-making processes.

Advanced transport models and policy-assessment tools are becoming increasingly complex in terms of theoretical background, mathematical formulation and computer implementation. Because of this, many models are actually black-boxes and the final acceptance of their results just depends on the subjective judgement made by policy-makers. EC/DG TREN considered this situation a major problem blocking the more effective integration of scientific support into policy-making processes, especially at the EU level.

spotlightsTN activities try to achieve a consensus across the transport modelling community in relation to specific mechanisms to define how the scientific character of a model can be recognised (SPQR form to declare the "pedigree of the model"), how the model can be documented in a transparent and harmonised manner (Mdir directory of models), how results from models can be exchanged using a single exchange format (GTF) and how use-friendly interfaces to models can be developed according to the needs of policy-analysts.

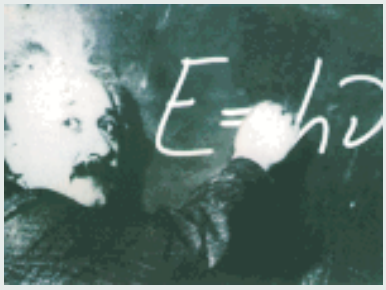
spotlightsTN activities were devoted to organising and supporting four different discussion lines, each one aiming to produce as a conclusion a new specific mechanism (procedure, tool) helping to make advanced transport models more accessible to decision-makers, so they would use them more effectively. Outputs from closely related projects (e.g., ATOM, THINK-UP and TRANS TALK) have been included in the actitivies.

spotlightsTN, all considered, is about inducing transport modellers a greater sensitivity towards the growing interest and the new opportunities ahead "to bring their advanced models to light".

Discussion line	Goal	Objectives	Deliverables
Dcode	**Recognition**	Quality control for modelling works. Definition and implementation of the "scientific pedigree" of models.	**SPQR Form** www.mcrit.com/spotlights/dcode
Mdir	**Transparency**	Harmonised descriptions of transport models. Inventory of existing transport models with interest for European decision-makers in co-operation with modellers	**Mdir Database** www.mcrit.com/spotlights/mdir
GTF	**Compatibility**	Definition of a standard data model and format for transport model results, in co-operation with developers of modelling software packages and modellers	**GTF Specifications** www.mcrit.com/spotlights/gtf www.gtf.mkm.de
LTV	**Usability**	Improving user-interaction with models in co-operation with ATOM. Identification of new software technologies to facilitate model's integration into open multi-software support systems driven by user-friendly interfaces	**LTV On-line information** www.mcrit.com/spotlights/ltv

Activities		
Electronic Activities	Electronic conference GTF Forum (Web Forum) Survey on modeller's views Interactive Website	Mailinglists Personal Interviews On-line information
Workshops	Urban transport models (Brussels, February 2000) DCode (Brussels, October 2000) Mdir (Brussels, December 2000) GTF (Copenhagen, August 2001) GTF (Barcelona, October 2001)	
Final Conference	Brussels, February 2002	

Dcode: SPQR
"Scientific recognition"



The goal of DCode is to provide the modelling community with a standard quality control procedure and to provide end-users with security about a model s scientific consistency and policy relevance.

The essential questions discussed in the DCode were, then, how to define a fair and harmonised pedigree form for advanced transport models? Is there a need for auditing and rating the scientific quality of a model? Is this possible?

DCode work has resulted in a Pedigree form (SPQR: Speak like you are) to be filled in by each modeller that contains the following properties:

- ❑ Model Documentation
- ❑ Model Reproduction
- ❑ Model Maintenance
- ❑ Model Accessibility

The SPQR form defines the scientific pedigree for each one of the following dimensions:

- ❑ S Input Data (Sample)
- ❑ P Theory (Postulates)
- ❑ Q Formula (Quantifiers)
- ❑ R Output Data (Results)

Dcode has been discussed in a specific workshop (Brussels, October 2001) and tested by the Scientific Commitee in an specific assessment study, in co-operation with Mdir.

Dcode could become a procedure or guideline to be included in modelling contracts between client institutions and modellers.

Mdir:
"Harmonised description of transport models"

The Mdir directory of models covers strategic models at the EU level, as well as national, interregional and sectoral models especially interesting at the European level. It has free access by Internet. The Directory was produced by NEA, having MKmetric support for passenger models. It was validated by the spotlights Scientific Commitee. Mcrit has developed specific software tools to manage the resulting database through the Internet.

Mdir has been discussed in a specific workshop (Brussels, November 2001) and tested by introducing more than 200 models.

Mdir could become a reference for modellers to describe their models.

The Mdir is a way to get harmonised information about transport models in Europe. Models can be compared on their characteristics, which in itself leads to interesting conclusions. The Mdir will "set light" on European transport models and can help policy makers and experts to make an effective use of advanced scientific models (i.e. Spanish modellers can learn from experience from Scandinavian modellers, or policy makers wishing to have an answer on a certain type of question can see whether such a model is available). Mdir can be the platform for an inventory of European transport models.

Mdir includes different type of information:

- ❑ Model's name
- ❑ Abstract
- ❑ Policy relevance
- ❑ Geographical Scale
- ❑ Time Horizon
- ❑ Scope of the model
- ❑ Transport domain
- ❑ Intermodality
- ❑ Type of formulation
- ❑ Links with other models
- ❑ Integration with evaluation tools
- ❑ Integration with decision support

- ❑ Modeler
- ❑ Proprietor
- ❑ Status
- ❑ Applications
- ❑ Legal Aspects
- ❑ Commercial Aspects

- ❑ Input Database structure
- ❑ Network definition
- ❑ Zoning
- ❑ Organisational network
- ❑ Surveys
- ❑ Traffic counts
- ❑ Socio-economic data
- ❑ Base matrix

- ❑ Generalised Cost functions
- ❑ Type of users and units
- ❑ Trip purposes
- ❑ Time values
- ❑ Network calibration
- ❑ Trip Generation
- ❑ Trip Distribution
- ❑ Modal Split
- ❑ Scenarios
- ❑ Periodicity
- ❑ Assignment
- ❑ Sensitivity test
- ❑ Type of the results
- ❑ Output Database structure

- ❑ Modeling software
- ❑ Statistical software
- ❑ Database software
- ❑ GIS software
- ❑ Hardware and OS
- ❑ Expected Running time
- ❑ Usability

- ❑ Planned improvements
- ❑ Scientific Validation
- ❑ Quality assessment

discussion lines

GTF:
"Generalised Transportation-data Format"

The goal of GTF is defining and getting an agreement in the modelling community regarding the interest and feasibility of adopting a common data format as an import/export process between transport datasets. The work took the already existing Bridges/GTF Specification as the starting point.

The GTF Conceptual Model proposed is a framework, which can be used to define the information that is contained in data. It wraps data into information entities containing the basic data and the necessary supplementary information (meta-data) to give meaning. It, therefore, ensures that the input data to a transport model fits the model's information requirement.

The GTF Conceptual Model enforces (if used correctly) a user to make the implicit information explicit by wrapping the data into entity structures giving information .

The main GTF entities are:

- ❑ Node
- ❑ Factor
- ❑ Link
- ❑ Mode
- ❑ Vessel
- ❑ Chain
- ❑ DynamicSegmentation
- ❑ Alternative
- ❑ Unit
- ❑ Meta
- ❑ Group

The GTF task hosted an electronic forum during 2001 to discuss the specification. It was then proposed and discussed in workshops in Copenhagen (August 2001) and in Barcelona (October 2001). It has been formally presented at the European Transport Research Conference (ETC, 2001) and introduced at the World Conference of Transport Research (WCTR, 2001).

LTV:
"Long-Term Visions to improve model's usability"

The goal of the LTV discussion line is to integrate the work of ATOM into spotlightsTN, and provide a feed-back based on the experience of spotlightsTN members.

Achieving a maximum level of usability (on-line , interactive and friendly access) requires solving two sets of very different problems:

- ❑ The interactivity gap (on-line communication between remote computer systems and models able to run in real-time, providing "just-in-time" outputs when feasible)

- ❑ The user-friendliness gap (translation of user's questions into model inputs and translation of model outputs into meaningful, policy-relevant, answers)

Contrary to general intuition, solving these gaps is not a matter of software expertise only: it requires a deep understanding of the model's formulation and its policy-relevance in order to communicate efficiently the key issues at stake to end-users. Moreover, organisational and institutional aspects have to be taken into account.

LTVisions has documents published in the spotlightsTN website that relate to ATOM. Material includes advice and samples for modellers to develop user-friendly and interactive web-based interfaces, as well as information on new technologies, such as semantic webs, helping end-users to get effective access to advanced models.

ATOM

The ATOM (Access TO Models) project has been set up to provide recommendations on how the Commission can improve the use it makes of transport models.

The aims of this project are:

- ❑ Define the options for providing Commission officials with analytical services options based on the use of transport models, in the context of the Commission s institutional structure and decision making processes.

- ❑ Assess the options against a set of criteria including policy requirements, costs and risk.

- ❑ For a selected short list of options, specify how the access would be provided and produce prototypes or demonstrators for these options.

- ❑ Produce a Longer Term Options Plan that provides a link between this work, ETIS development and possible progress on standardisation of model interfaces and data.

The Spotlights Thematic Network (TN) is the most closely linked project to ATOM and through its four main themes (Dcode, Mdir, GTF and LTVisions) has provided a number of important inputs to ATOM.

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TRANS-TALK

The TRANS-TALK Thematic Network was set up in January 2000 under the Fifth Framework Programme with the objective to provide a networking platform for those involved in the field of transport evaluation; explore the conceptual and empirical problems in contemporary transport evaluation; and develop guidelines that help improve transport evaluation.

The launch of the TRANS-TALK thematic network reflects the renewed strategic interest in transport evaluation. This has different sources - conceptual, empirical and policy-relevant.

At the conceptual level, this renewed interest in transport evaluation is related to the realisation that the conventional methods for evaluation that apply to infrastructure appraisal, like cost-benefit analysis, are not adequate to address contemporary challenges to transport policy. At the empirical level, there is, on the one hand, the problem of choice among a multitude of methodologies and, on the other, the problem of measurement and comparison. Finally at the policy-relevant level, there is today an intensified demand for evaluation that looks at the (long-term) outcomes of policy rather than alone at its (short-term) direct outputs.

TRANS-TALK discussions lead to the following conclusions:

❑ Transport-specific evaluation frameworks exist in most Member States of the European Union, albeit mainly for infrastructure assessment at project level. These are used for ex-ante evaluation or appraisal, and for the prioritising and phasing of projects.

❑ The gradual consolidation of the European Union as a polity, with own institutions, an own redistribution budget, own policy networks and agendas and own decision processes, represents a challenge to evaluation in the European context. This is not least because of the subsidiarity principle which prescribes that the Union may only intervene where there would be an added value from this intervention. Only there does not always exist either clarity or agreement as to how to define and measure this added value.

❑ There are several methods or tools that can be used for evaluation. These can be classified according to four dimensions: (a) the analytical framework from which they emerged; (b) their suitability for policy, programme or project evaluation; (c) their suitability for different phases of policy analysis, and (d) the extent to which they rely on statistical or mathematical methods or models, or alternatively make use of quantitative methods.

❑ Scientific inquiry has progressed with regard to several contemporary difficult issues for transport evaluation, like transport and economic development; network effects and European-added value; time, term and uncertainty; the welfare basis of evaluation; and environmental valuation.

❑ Transport evaluation has till now been mainly technocratic in focus. As a result, there is a weak link between the community of transport professionals who undertake the analysis and decision-makers or their policy advisers, which can result in communication failure.

For each conclusion, a number of concrete recommendations were proposed.

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THINK-UP

The aim of the project is to set up a network of experts in transport demand forecasting and scenario building in order to describe the state of the art of methodologies, but also to improve the mutual understanding of the results obtained. These results will be analysed in relation to the THINK-UP objective of a common platform of understanding for European mobility predictions.

Many forecasts are produced with their own assumptions, and their specific tools but as yet there does not exist a common basis for comparison and discussion of different results. As recent scenarios exercises have shown, new steps are now necessary in the production of trends. In particular, the contribution of different modes must be explained and quantified, so that the most effective use of transport modes or intermodal solutions can be defined and applied towards objectives of sustainable development. Such a common platform for comparison, providing a wide consensus on the main trends and the sensitivity of the transport system to policy measures will help to express, not only common goals, but also common policies.

Such an approach for predicting trends thus appears as a prerequisite for the evaluation of societal needs and their translation into policy actions. This is essential so that social values can be properly introduced in the assessment of policy measures, enabling policy makers to "steer" the future in a world where uncertainty, and profound changes (technological, economic, institutional) are at work. THINK-UP will provide a useful contribution to improvement of the Pilot SEA (Strategic Environmental Assessment) which interlinks transport activity with socio-economic factors and the environment.

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