Amitran
UPDATE
June 2014

Amitran
CO$_2$ Assessment Methodology for ICT in Transport

About Amitran

Successful deployment of Intelligent Transport Systems (ITS) can make a significant contribution to CO$_2$ reduction targets – possibly up to 25% with certain measures. However there is no standardised method for estimating the impact of such ITS implementations on emissions: different methodologies have been deployed up to now, leading to a lack of comparable data and difficulties in benchmarking.

Amitran has defined such a methodology, which can be used as a reference in future projects.

The Amitran evaluation framework will help ascertain the effects of Information and Communication Technology (ICT) measures in traffic and transport on CO$_2$ emissions.

It will help decision makers and evaluators to assess the likely environmental benefits of different ITS applications and help foster the deployment of ITS to make road, rail and inland waterway transport in Europe more sustainable.

Welcome to Amitran Update

This newsletter highlights some of the key achievements of the final stage of the Amitran project (Assessment Methodologies for ICT in multimodal Transport from user behaviour to CO$_2$ reduction).

The project runs from November 2011 to September 2014. In this issue we cover:

- The Guidance Wiki and Knowledge Base
- Model Interfaces
- Economic Evaluation

For further information on the project, to sign up for email updates or to get in touch with the project team, we invite you to visit *www.amitran.eu*

Amitran outputs and progress

Guidance Wiki and Knowledge Base

The Amitran Guidance Wiki and Knowledge Base is now available at http://amitran.teamnet.ro

This wiki site provides the project's outputs in an easy to use way and serves as a reference tool to guide users and stakeholders in using the proposed methodology in their assessment activities.

It comprises a Checklist which is a step-by-step guide through the Amitran process, as well as more technical information covering the Amitran Framework Architecture and Methodology.

This site also provides the model interface downloads and the statistical knowledge base for scaling up.

The wiki is currently undergoing external evaluation and comments are welcome!

Model Interfaces

### What are the interfaces?

An interface is a piece of software that provides a generic connection of two or more models or model categories, with the possible exception of model-specific data formatting.

What form do the interfaces take?

In Amitran, an interface consists of a generic interface and several implementation-specific interfaces (adapters). The generic part contains all the internal processes of the interface and defines a generic data format. It provides generic interfaces to two or more model categories. For each model category, implementation-specific adapters can be constructed for specific model implementations in this category. Amitran has specified and built the generic interface, and implementation-specific adapters for some example model implementations. The model implementations already exist and Amitran does not modify them.

Generic interfaces

The generic interfaces are described as an XML schema. Amitran has implemented the following generic interfaces (indicated as red in the following diagram):
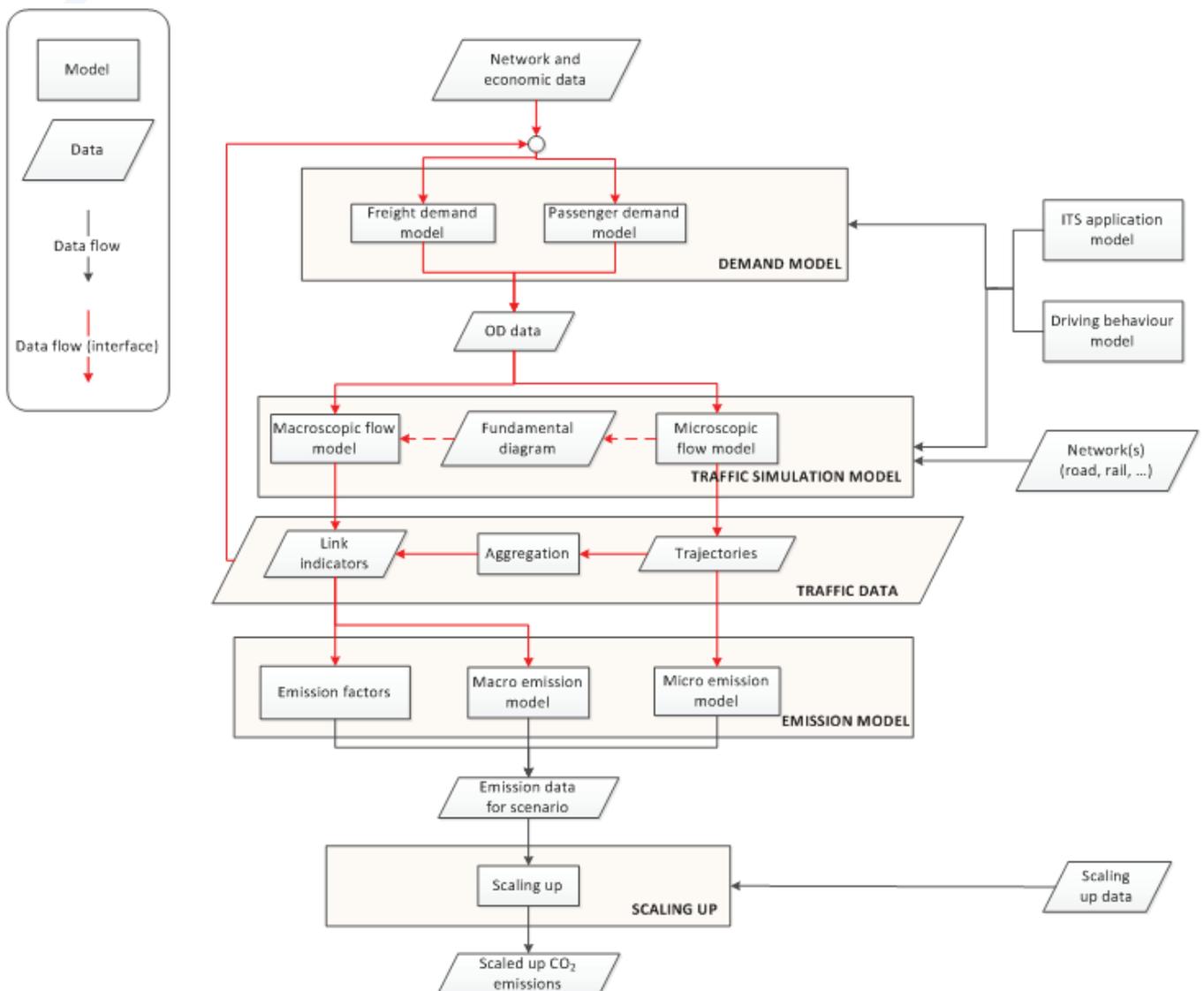
1. Network → Demand model: to make relevant network properties available to a demand model in a generic format;

2. Demand → Traffic simulation model: to produce Origin-Destination (OD) relations needed by a traffic simulation;

3. Traffic simulation → Demand model: to make performance indicators calculated by a traffic simulation (e.g. travel time per OD relation) available to a demand model to account for long term changes in demand;

4. Microscopic traffic simulation → Macroscopic traffic simulation model: to provide trajectory data produces by a microscopic traffic simulation to a macroscopic traffic simulation;

5. Traffic simulation → Emission model: here the following interfaces are defined:

6. Microscopic traffic simulation → Microscopic emission model: to provide trajectory data;

7. Macroscopic traffic simulation → Macroscopic emission model/emission factor: to provide link level traffic performance statistics;

8. Microscopic traffic simulation → Macroscopic emission model/emission factor: to provide link level traffic performance statistics after aggregated from trajectory data.

Implementation-specific adapters

The following specific adapters have been implemented in Amitran:

Specific adaptor	Interface type
TAPAS ⇨ SUMO	Demand ⇨ Traffic simulation model
	Traffic simulation ⇨ Demand model
DynaSmart ⇨ Versit+ macro	Macroscopic traffic simulation ⇨ Macroscopic emission model
Omnitrans ⇨ Versit+ macro	Macroscopic traffic simulation ⇨ Macroscopic emission model
VISSIM ⇨ PHEM	Microscopic traffic simulation ⇨ Microscopic emission model
SUMO ⇨ PHEM	Microscopic traffic simulation ⇨ Microscopic emission model
ITS modeller ⇨ Versit+ micro	Microscopic traffic simulation ⇨ Microscopic emission model
ITS modeller ⇨ Versit+ macro	Microscopic traffic simulation ⇨ Macroscopic emission model
SUMO ⇨ HBEFA	Microscopic traffic simulation ⇨ Macroscopic emission model

Economic Evaluation within Amitran

Part of the Amitran framework for evaluation is the economic impact assessment of ICT measures. The economic impact assessment is scheduled to take place after the modelling within Amitran has taken place. The resulting figures from the modelling are the inputs for the economic impact assessment.

There are a range of economic evaluation techniques available, each of which has its own value-added, advantages and limitations. In Amitran the focus is on two frequently used evaluation methodologies: a cost-benefit analysis (CBA) and a cost-effectiveness analysis (CEA).

An appropriate strategy in the appraisal studies of different ICT measures would be to apply economic CEA at an early stage and economic CBA after a period of further data collection. In the early stage CEA can then be applied to rank different technologies for example only in terms of the costs per decrease in CO_2. This means that in this case only the impacts on CO_2 emissions need to be established and that other effects do not have to be taken into account . The other effects of the ICT measure on traffic (safety, travel times, etc.) can be estimated in a second phase, allowing a CBA to be carried out.
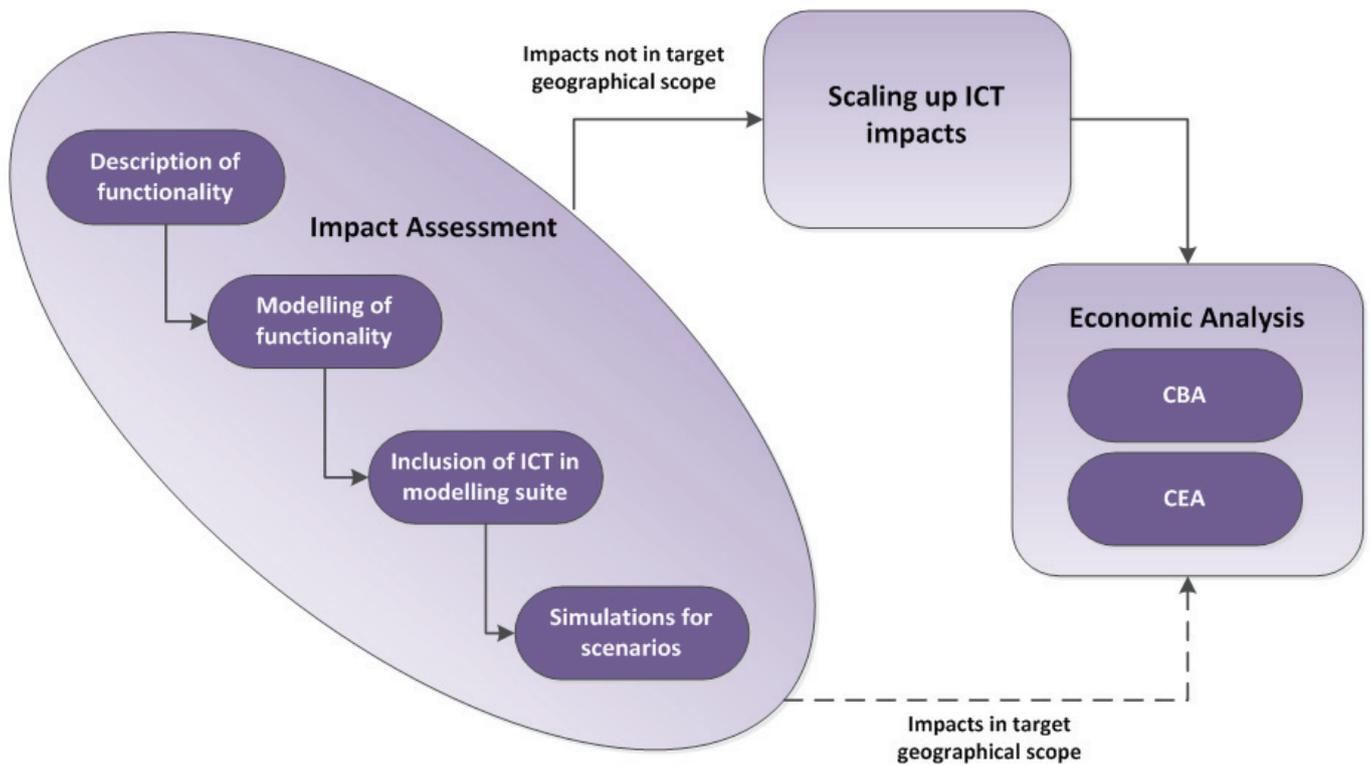
Amitran

The position of economic analysis in the Amitran evaluation framework

Using these two evaluation methodologies within the Amitran framework enables the users to produce a first indication or quick scan of the expected outcomes of a CBA and a CEA. Based on this, discussions on the feasibility and desirability of a certain ICT measure(s) can be started.

The description of how to perform a CBA or CEA focuses on persons with little or no knowledge of CBA and/or CEA. This means that much attention is paid to the type of information that is required and the activities to be carried out. By carrying out the mentioned steps one should be able to produce a quick scan CBA or CEA. The steps that need to be taken are all incorporated in the guidance wiki together with an elaborate explanation.

A quick scan is one that focuses on the main costs and benefits of a project based on general, easy-to-use guidelines for the determination of these impacts. These impacts give a good first indication on whether or not it is a feasible project and on the ranking of different project alternatives.

Amitran at the ITS European Congress, Helsinki

In addition to the Amitran Final Conference in Helsinki on 16 June, the project has three presentations as follows:

Session TS11 Tuesday 17 June at 16:00, Room 206

• Integration of CO_2 Assessment Tools (by Michael Behrisch, DLR)

Session TS25 Wednesday 18 June at 11:00, Room 216

• CO_2 assessment methodologies for evaluating ITS – Amitran project results (by Gerdien Klunder, TNO)

• Amitran methodology for CBA and CEA of ITS measures (by Dick Mans, Ecorys)

Consortium Partners

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