Amitran UPDATE

October 2013

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 is defining 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.

Amitran receives funding from the European Union Seventh Framework Programme under grant agreement no. 287551 FP7.

Welcome to Amitran Update

This newsletter highlights some of the key achievements 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 July 2014, so this is an ideal time to highlight some of our work so far, particularly on the following topics:

- Generic evaluation framework to assess the environmental impacts of Intelligent Transport Systems
- Scaling up knowledge-base
- Open interfaces for models

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

Generic evaluation framework to assess the environmental impacts of ITS

What is it?

The central objective of Amitran is to develop a framework aimed at assisting bodies deploying or studying ITS applications (public authorities, infrastructure operators, researchers and consultants) to more effectively evaluate the likely environmental impact of an application. This will help provide a more robust base for decision-making that will assist the roll-out of green ITS solutions.

The project does not develop new models – users can make use of existing models that they may already have access to, together with appropriate data – in addition to the Amitran tools.

However, Amitran will guide users in choosing the approach, type(s) of model(s) to use, the type of data needed, etc.

An example of a research question that could be addressed by the Amitran methodology is:

- What are the effects of Adaptive Cruise Control on CO_2 emissions at EU level when 50% of the vehicles are equipped with the system?

Or in more general terms:

- What are the effects of a certain system on CO_2 emissions on a certain level for a certain penetration rate?

What has been achieved?

An evaluation framework has been produced, based on the elements in the diagram below.

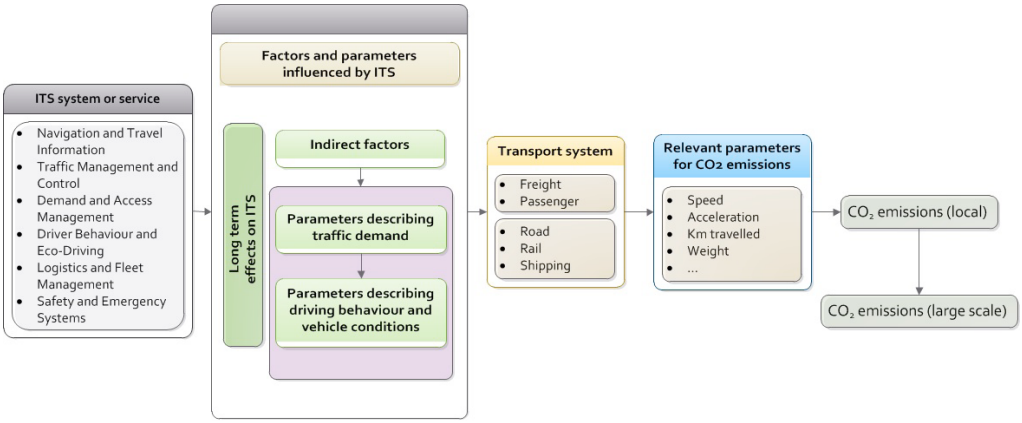


Illustration (left):

Amitran evaluation framework, illustrating the different elements linking ITS deployment to changes in CO_2 emissions

A list and categorisation of ITS services has been developed, in line with the categories suggested by the ECOSTAND project (*www.ecostand-project.eu*). The factors and parameters influenced by ITS have been identified, which are divided into four groups:

1 - Parameters describing traffic demand

2 - Parameters describing driving behaviour and vehicle conditions

3 - Indirect factors

4 - Long term effects of ITS.

By separating the direct and indirect effects of ITS, Amitran follows a new approach, compared to assessments done in the past. This approach offers a better understanding of the mechanisms by which ITS exert their influence, which is required for the development of the Amitran methodology. It also follows a "well-to-wheel" approach, whereby emissions from the whole energy chain are considered, not just the direct emissions from the vehicle, train or vessel.

The methodology has been developed along systematic cases, such as adaptive cruise control, Smartphone applications giving multimodal travel advice, and roadside route advice taking into account real-time information.

What next?

Based on the generic evaluation framework, the requirements for the model interfaces are being defined. Validation with use-cases is also continuing.

Scaling up knowledge base

What is it?

The purpose of a generic scaling up methodology, together with a publicly available knowledge base with links to statistics, is to translate local effects to effects on the national or European level. This is useful for assessing ITS applications, policies and strategies on a large scale where data is only available at local or city level. Scaling up can be done by a direct method – using statistical information, or by modelling – using a macroscopic multimodal traffic simulation model.

Amitran online guidance and checklist tool

A user-friendly online tool is being developed to enable users to access Amitran's outputs and to assist them in their use. It will be free to registered users and comprise a wiki-style guide as well as a checklist which will take users through the assessment process.

A first limited version will be piloted this autumn and the final version will be available in April 2014.

Cooperation and events

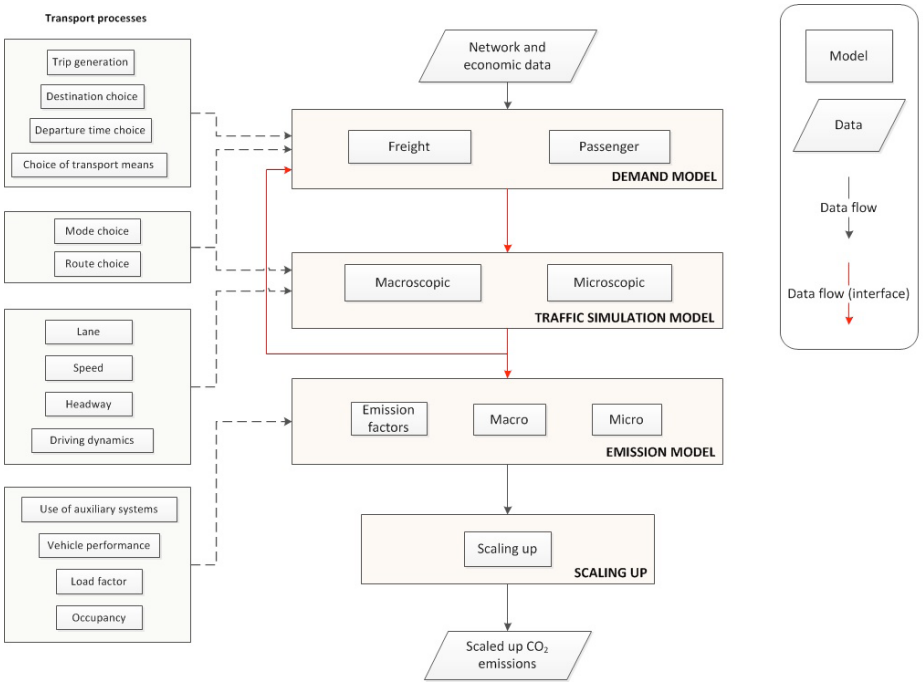
Amitran is cooperating with related European and international projects such as eCoMove, ECOSTAND, ICT-EMISSIONS and Compass4D in order to share information and approaches. Two stakeholder workshops have already been held, on user needs (February 2012) and on methodology validation (May 2013).

Illustration (right):

Simplified flow diagram for the Amitran evaluation framework.

The parameters influenced by ITS on the left, the legend on the right, and the framework itself in the middle.

Three model categories are shown (demand model, traffic simulation model and emission model), and the scale of the model that is needed for the assessment (micro or macro, freight or passenger) depends on the type of ITS application being considered.



What has been achieved?

A general outline of a scaling up methodology has been developed.

Using the direct method, impacts on CO_2 emissions at a local level as distinguished for different situations (such as road type, traffic state, vehicle type, etc.) are scaled up using statistics on kilometres driven (for the relevant modes) under each of these specific situations. This method is applicable when interaction and second order effects can be expected to be insignificant, or when there is a clear effect for certain traffic situations, for which data on higher level are available.

Scaling up using a macroscopic model is appropriate when second order effects are expected or when the effects of the ITS application can be used directly as an input parameter for the macroscopic model. Of course the choice depends on whether a macroscopic model is available. In scaling up limitations are imposed by the type of network for which the results are available (effects on interurban transport are easier to scale up than data at city level) and also the type of ITS.

A scaling up knowledge base is under development, which contains general information about the scaling up methodologies, detailed information for specific use cases, examples of scaling up, and links to data that can be used for scaling up.

What next?

Amitran is currently collecting links to data for scaling up at EU and country level, as well as further developing and implementing the knowledge base. The project will then validate the method with selected use cases.

Attending the 2013 ITS World Congress in Tokyo?

*Thomas Benz from PTV will present a paper on Amitran entitled **"Methodology and Framework Architecture for the Evaluation of Effects of ICT Measures on CO_2 Emissions"**, on Wednesday 16th October (session TS066). This paper, authored by Eline Jonkers from TNO, has been selected for one of four Best Paper Awards for technical papers.*

Amitran

Open interfaces

What are they?

Amitran will help users in interfacing between different models by creating generic interfaces between models (model types) to allow the output of one model to be accepted as input for another. This will take the form of an open interface for relevant models available to the Amitran partners (e.g. SUMO, ITS modeller, VISSIM, VISUM, etc) that will provide a direct link to other models needed for assessing ICT measures, and to the scaling up process.

What has been achieved?

The requirements and specifications of the open interfaces have been defined. A selection of models for the implementation of specific interfaces has been *made - these are mostly models which are either owned or can be accessed by Amitran partners. The project has also defined which specific interfaces will be implemented for these models.*

What next?

The specific interfaces will be implemented for the selected models. Then, a verification process will be conducted to ensure the proper functioning of the implemented interfaces. The interfaces will be described in public documents and made publicly available in 2014.

Keep up to date with Amitran news and events!

Join the Amitran Forum and Linked In group - Visit ***www.amitran.eu/get-involved/***

You will receive email updates on the project every few months and also be informed of the planned Amitran final conference which will take place in mid-2014.

Save the Date

14-18 October 2013
20th ITS World Congress, Tokyo, Japan
For more information on the Programme and all other aspects, please visit the ITS World Congress website:

www.itsworldcongress.jp

16-19 June 2014
10th European ITS Congress, Helsinki, Finland
For more information, please visit:

www.itsineurope.com

Consortium Partners

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