



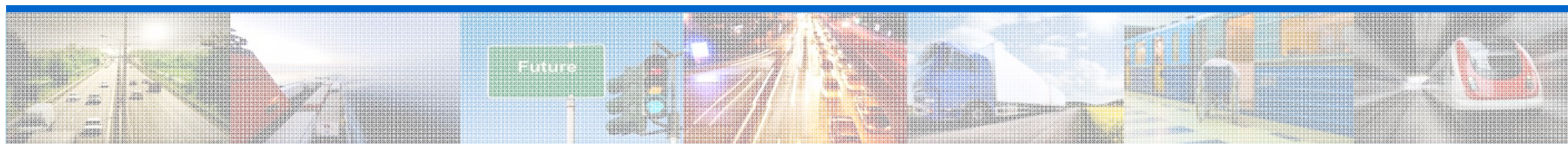
United Nations Economic commission for Europe
Transport Division

Mitigation of environmentally harmful effects of inland transport

For Future Inland Transport Systems (ForFITS)

Miquel Gangonells

WP.6, 19 June 2013





The UNDA project

(1/2)

- 2008 **Call for funds** by the UNECE Transport Division on the UN Development Account (UNDA)
- 2009 **Project endorsed** by the UN General Assembly
Duration: 3 years (January 2011 - December 2013)
Leading agency: UN ECE (Economic Commission for Europe)
Implementing entities: ECA, ECLAC, ESCAP & ESCWA (other UN Regional Commissions)
- 2010 **Project document**
Major phases and activities of this three-year project defined

Main objective: enhanced cooperation & planning for sustainable transport

Main focus: capacity building

Target: policy makers and technical experts

Project leveraging on the **development of a modelling tool (called ForFITS)** meant to be freely available for all UN Member States) capable to assist users in the selection of the most appropriate and effective measures to reduce CO₂ emissions in the inland transport sector (including road, rail and inland waterways)



The UNDA project

(2/2)

2011 Project launched

Tasks and responsibilities of UNECE and other Regional Commissions defined in [ToR](#)

Development and distribution of a [questionnaire](#) to provide inputs for the preparation of a *global status report*, containing a review on existing statistical data, policy measures and assessment tools concerning CO₂ emissions in transport

2012 [International Expert Meeting \(IEM\)](#) (April) to disseminate information, share experiences, identify possible synergies with other stakeholders

[Peer-review workshop](#) to discuss the draft *global status report* and to give feedback on a *draft methodology* of the ForFITS tool (April)

Finalisation of the *global status report* (October)

Release of the [prototype version of ForFITS](#) (December)

2013 Release of the [advanced prototype of ForFITS](#) (May)

Development of *final methodological note, user manual* and training material (2nd quarter)

Pilots (3rd quarter)

[Capacity-building and training workshops](#) (3rd quarter)



ForFITS characteristics

(1/3)

Key requirements

Allow the estimation/assessment of emissions in transport
Allow the evaluation of transport policies for CO₂ emission mitigation

Convert information on transport activity into fuel consumption and CO₂ emission estimates considering the influence of the demographic and socio-economic context, including policy inputs

Be developed as a software tool

Be freely available for users (e.g. national and local governments, general public)

Be developed between 2011 and 2013

Sectoral model (focused on inland transport only): we do not expect it to target the evaluation of overall effects on the economic growth



ForFITS characteristics

(2/3)

ForFITS covers

- Passenger and freight transport services
- Nine transport modes: non-motorized transport, two wheelers, three wheelers, light road vehicles, medium and heavy road vehicles, rail, navigation (inland, short-sea and deep-sea/martime), air and pipelines
- Different vehicle subsets within each mode
- Several possible powertrains (e.g. internal combustion engines, hydraulic hybrids, electric hybrids, plug-ins, fuel cell, electric)
- Several fuel options (where suitable) for each powertrain

Transport demand is largely determined by the relationship linking GDP and GDP per capita with vehicle ownership, passenger kilometers and tonne kilometers

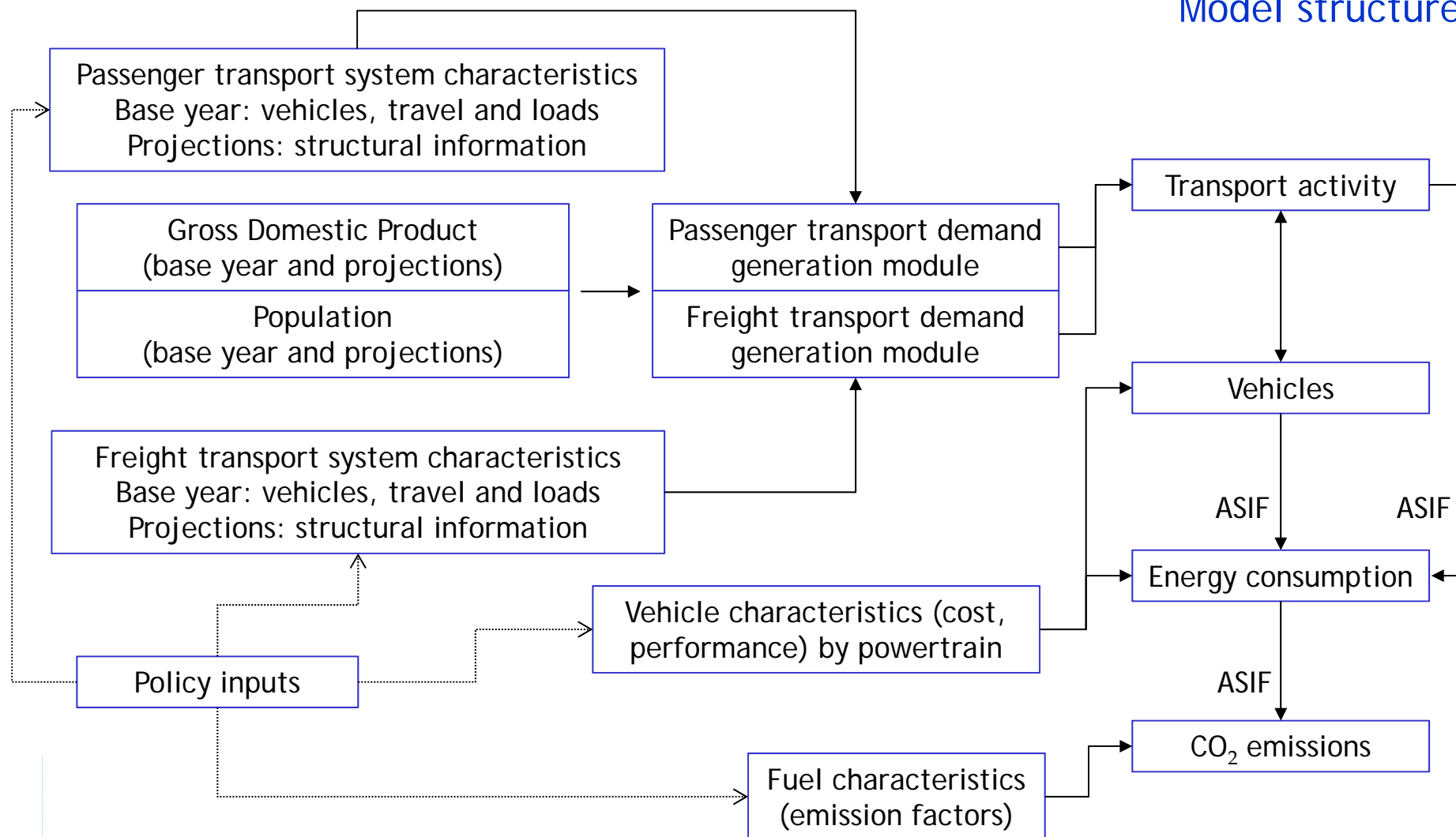
Transport demand characterizing each mode and vehicle class also depends on parameters affecting the driving cost of different vehicle types and the cost of different powertrain options



ForFITS characteristics

(3/3)

Model structure





ForFITS

Selected key parameters (inputs, outputs)

The model does require a substantial amount of data, in order to

- characterize the transport system in the base year
- define the economic system and the policy inputs in the future
- characterize technologies (current status, short & long term)

Inputs (projections, policies, technologies)

- GDP, population
- Initial conditions:
 - Vehicle stock
 - New vehicle registrations
- Transport system characteristics:
 - Passenger
 - Freight
- Prices and taxes
- Fuel characteristics
- Fuel consumption
- Vehicle and powertrain costs
- Modal and vehicle classes shares
- Elasticities

Outputs

- Passenger transport activity (pkm)
- Freight transport activity (tkm, vkm, tonnes lifted, haul length)
- Modal shares
- Vehicle activity (vkm)
- Full information on vehicles (by mode, class, powertrain and age)
- Shares of powertrain technology used
- Share of fuel used
- Fuel use
- CO₂ emissions (well-to-tank, tank-to-wheel, well-to-wheel)
- Total cost of vehicle and fuel purchase



ForFITS

Selected key parameters (inputs)

Examples of data required rarely available

- **Vehicle stock**

Fuel consumption per km by powertrain

Average vehicle life

Shares of tonnes lifted by good type

Information (demographic, economic, number of vehicles, vehicle travel, vehicle load) by area (urban/non-urban)

Motorcycles split by two and three wheelers

$pkm, tkm = vehicles \times annual\ travel\ per\ vehicle \times load\ per\ vehicle$

- **Cost of driving**

Cost of fuel (taxation scheme) - energy statistics

Cost of crew - labour statistics

Cost of vehicles (taxation scheme) - transport statistics!

Road pricing - transport statistics!



Beyond the UNDA project

ForFITS conceived with the primary objective to evaluate contextually transport activity, energy consumption and CO₂ emissions

- It can consider issues with relevance at the urban, metropolitan, regional or national levels
- Wide range of data availability levels
- Local, national, international applications possible

The application of ForFITS can leverage on existing information, increasing the value already generated by their collection

Extensions of ForFITS can help answering a wide range of questions that are relevant for transport-, energy- and environment-oriented analyses, including:

- estimation of pollutant emissions
- interaction between transport networks and vehicle use
- evolution of fuel demand
- additional vehicle technologies (beyond those already considered)
- fuel and powertrain options on vehicles and engines requiring a special characterization (such as non-road mobile machines)
- material and energy demand for the manufacture and use of transport applications

ForFITS has the potential to become an important asset for the UN and its Member Countries

The UNECE Transport Division seeking stakeholders interested in the establishment solutions providing opportunities to maintain and further develop the model



ForFITS

Privileged partners: call for interest

UNDA project page

http://www.unece.org/trans/theme_forfits.html

Useful links

- Review on statistics, mitigation policies, and modelling tools

http://www.unece.org/fileadmin/DAM/trans/doc/themes/2012_-_UNECE_-_Global_Status_Report_October_2012_-_final_version.pdf

- Methodology

http://www.unece.org/fileadmin/DAM/trans/doc/themes/2012_-_UNECE_-_Draft_Concept_document_on_ForFITS.pdf

- International Expert Meeting

<http://www.unece.org/?id=29350>

Contact details

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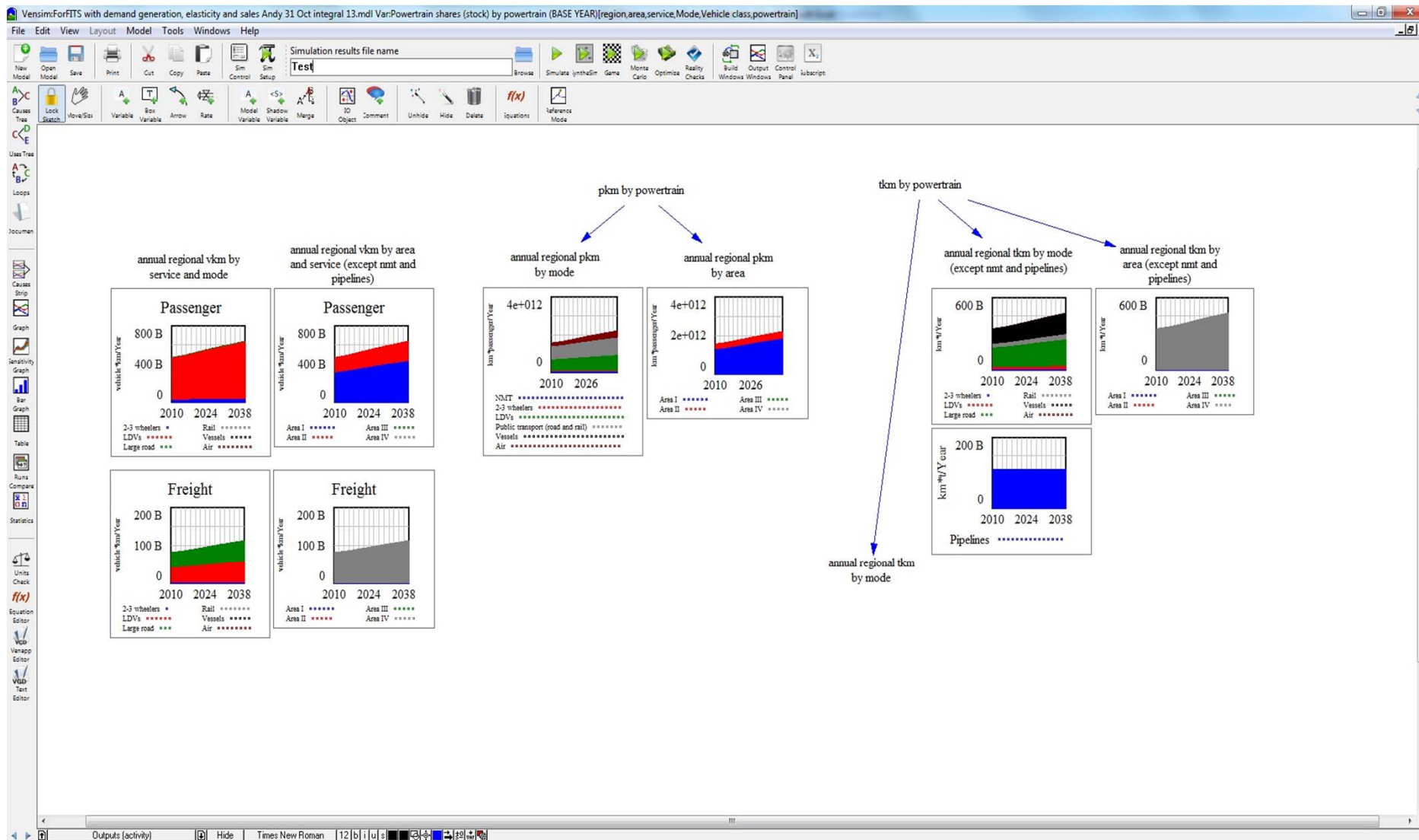
pierpaolo.cazzola@unece.org



ForFITS

Examples of views

(2/3)





ForFITS

Examples of views

(3/3)

ForFITS Inputs 1.xls [Compatibility Mode] - Microsoft Excel

File Home Insert Page Layout Formulas Data Review View

Clipboard Font Alignment Number Styles Cells Editing

Percent 2 Normal Bad Good Neutral Calculation Check Cell Explanatory... Input Linked Cell

A144

1 USER INPUTS
2 BASE YEAR AND FINAL YEAR
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9 POPULATION AND GDP
10 POPULATION (people)
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17 GDP (current USD, PPP)
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24 VEHICLE STOCK
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26 NUMBER OF ACTIVE VEHICLES (VEHICLE STOCK) (x of vehicles)
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