UNITED NATIONS
ECONOMIC COMMISSION
FOR EUROPE

(WP.5) Working Party on Transport Trends and Economics (26th session)
Geneva, September 2013

Evaluating CO_2 emissions in inland transport and climate change mitigation

ForFITS

A monitoring and assessment tool "For Future Inland Transport Systems"

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The UNDA project

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 CO_2 emissions in the inland transport sector (including road, rail and inland waterways)

The UNDA project

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 CO_2 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 (2nd quarter)

Development of a user manual (also containing methodological information)

Finalization of the ForFITS model (Summer)

Application in pilots, awareness-raising, capacity-building and training workshops (3rd and 4th quarter)

ForFITS: model requirements

Key requirements

Allow the estimation/assessment of emissions in transport
Allow the evaluation of transport policies for CO_2 emission mitigation

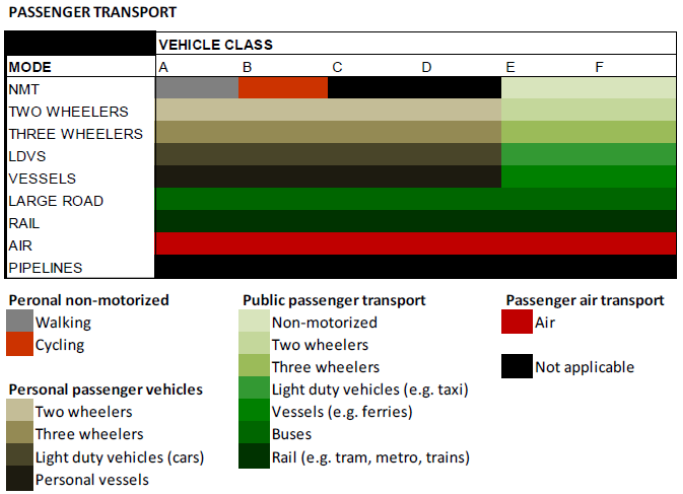
} Convert information on transport activity into fuel consumption and CO_2 emission estimates considering the influence of the demographic and socio-economic context, including policy inputs

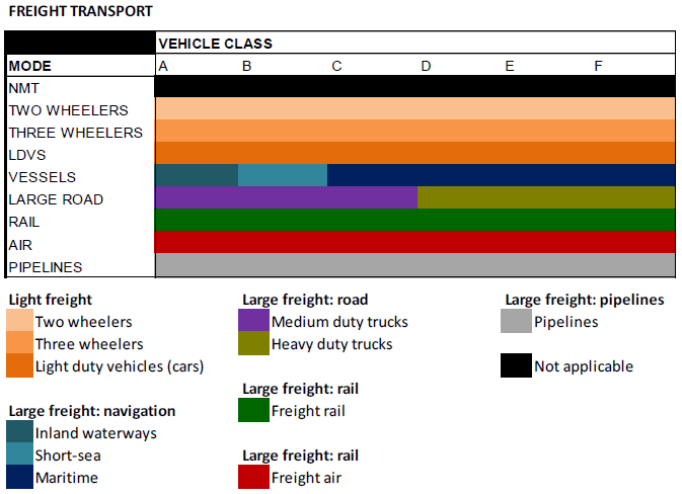
Be developed as a software tool
Be freely available for users (e.g. national and local governments, general public)
Be developed between 2011 and 2013

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

ForFITS model: coverage

- Passenger and freight transport services
- Two different areas (e.g. to define the transport systems: urban, non-urban, non-spec.)
- 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 (organized in six vehicle classes – A to F) (figures)



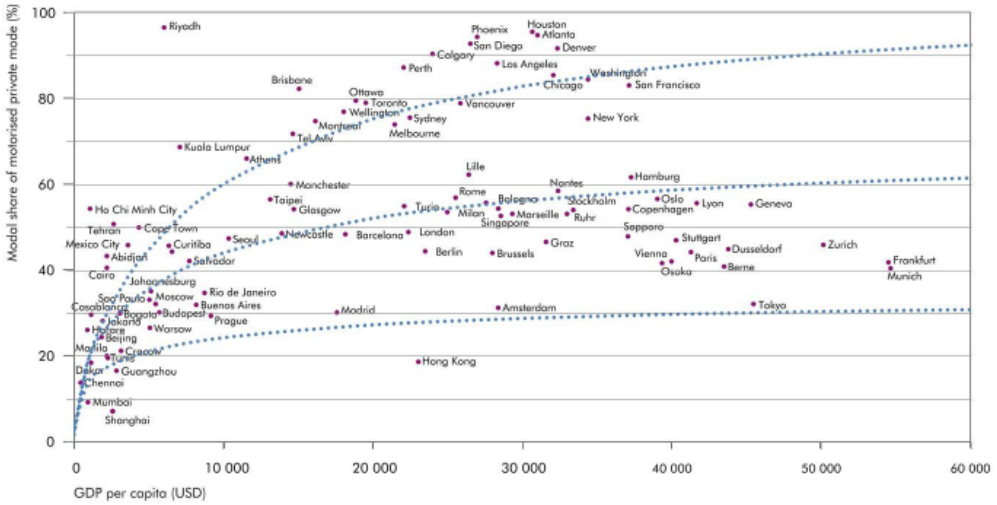


- 31 powertrain technologies (e.g. internal combustion engines, hydraulic hybrids, electric hybrids, plug-ins, fuel cell, electric)
- 10 fuel blends, some of which are associated with specific modes and/or powertrains

ForFITS model: demand generation (1/2)

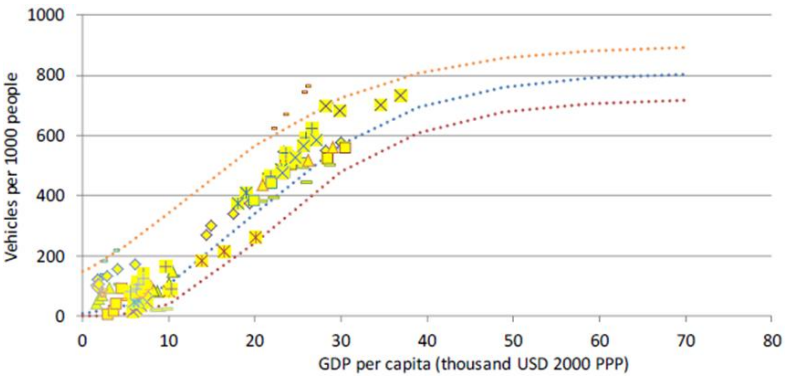
Transport demand largely determined by observed historical links between GDP and GDP per capita and vehicle ownership, passenger kilometers and tonne kilometers

Modal share of personal vehicles in total personal and public transport



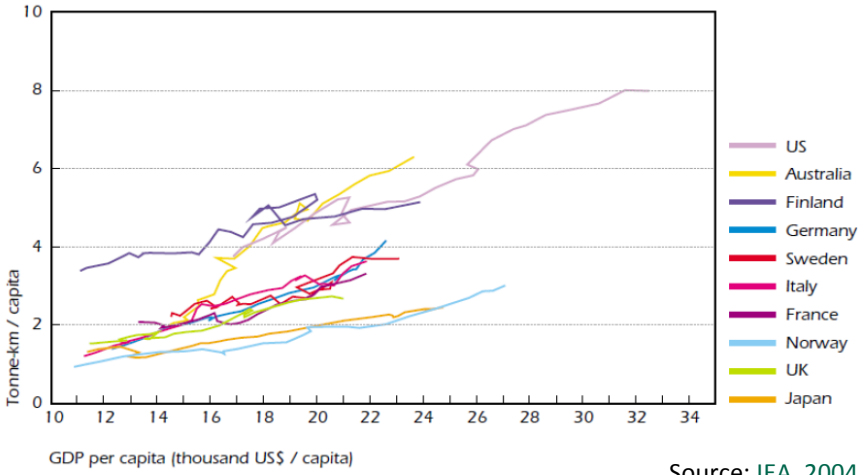
Source: elaboration of UITP, quoted by IEA, 2008

Motorized personal vehicles ownership



Source: elaboration of national and international databases, building on the information referenced in UNECE, 2012

Freight transport activity and GDP



Source: IEA, 2004

ForFITS model: demand generation (2/2)

Transport demand also depends on parameters (e.g. fuel prices and taxes) affecting the cost of driving and moving goods

Structural changes in the transport and economic system can be analyzed

- Passenger
  - shifts to/from personal from/to public transport
- Freight
  - trade-related nature of the economy (e.g. free trade vs. low imports and exports)
  - origin/destination of goods (e.g. changes in sourcing and/or destination of exports)
  - type of goods transported (e.g. change of importance of the manufacturing industry with vs. primary material extraction and trade)
  - modal competitiveness (e.g. changes due to the construction of new network links)

ForFITS model: fuel consumption

Fuel consumption is calculated from:

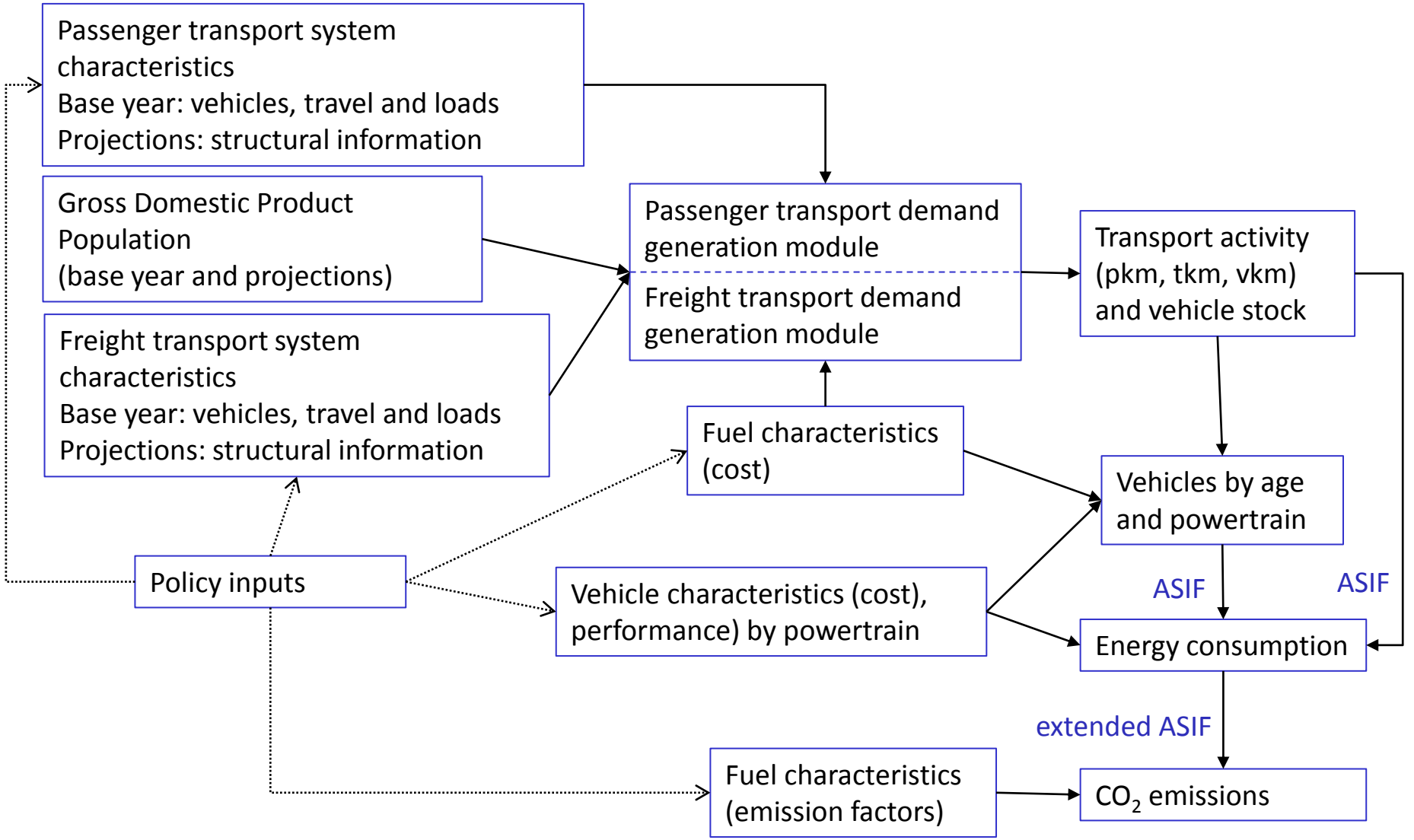
- vehicle activity
- the structure of the organization of vehicle across services, modes, vehicle classes and powertrain groups
- the energy intensity of each of the vehicles in this structure

ASIF: Activity, Structure, Intensity → Fuel consumption

The same methodological approach used for the calculation of fuel consumption (ASIF) can be extended to evaluate CO_2 emissions

This extension is suitable to the case of where several energy carriers need to be considered

ForFITS model: simplified structure



ForFITS users

Who may be interested in using ForFITS?

- Someone willing to understand the transport system he is concerned about (typically a geographical region), its impacts in terms of energy consumption and CO_2 emissions
- Someone having access to a sufficient amount of statistical information
- Someone having some degree of specific competence (transport, transport policies, energy policies, environmental policies)
- Someone having sufficient financial means to support his/her ambitions
- Someone from…
  - a national administration and/ore a local government
  - an Inter-Governmental Organization
  - a Non-Governmental Organization
  - an Academic institution and/or a consulting company
  - the industry sector (company/corporation, industry association)

Beyond the UNDA project

ForFITS was conceived with the primary objective to evaluate contextually transport activity, energy consumption and CO_2 emissions

- Local, national, international applications possible
- Flexible with respect to data needs

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-, environment- and safety-related analyses, including:

- estimation of pollutant emissions
- interaction between transport networks and vehicle use
- evolution of fuel demand (e.g. via the integration of a choice model)
- additional vehicle technologies (beyond those already considered)
- vehicles and engines with special characterization (e.g. non-road mobile machines)
- material and energy demand (e.g. for the manufacture of transport vehicles)
- road-safety (e.g. fatalities, injuries and effect of road-safety policies)

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

Links and contact information

Links

Review on statistics, mitigation polices, and modelling tools
http://www.unece.org/fileadmin/DAM/trans/doc/themes/2012_-_UNECE_-_Global_Status_Report__October_2012__-_final_version.pdf

International Expert Meeting
http://www.unece.org/?id=29350

Model download/UNDA project page
http://www.unece.org/trans/theme_forfits.html

User manual, including methodological information
http://www.unece.org/trans/forfits_user_manual.html

Contact information

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Workshop survey

http://www.surveymonkey.com/s/J9VZWMV