STRATEGIC TRANSPORT RESEARCH FOR EUROPEAN MEMBER STATES (STREAMS) - STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)

CLIENT: *European Commission DGVII - IV Framework R&D Programme for Transport*

YEAR: *1996 - 1999*

DESCRIPTION OF ACTIVITIES:

The context

The project was part of the research studies awarded by EC Directorate General VII - Transport - in the IV Framework Research Programme launched by the Commission on achieving the objectives of the Common Transport Policies.

The objectives

The central objective of the STREAMS project is the creation of a strategic, yet comprehensive, network based multi-modal transport model of the whole EU15 area covering passengers and freight and to produce initial reference forecasts of transport in the EU. An additional scope of the model was to develop new modelling software. The forecasts for year 2020 were produced in accordance with a 'business as usual' transport and socio-economic scenario. The idea of a "business as usual" scenario implies no significant breaks in trends in terms of transport policies and the general socio-economic environment.

The over arching objective of the project is based in the context of the Trans-European Networks (TENS) and the effects of external socio-economic developments on the efficient functioning of the TENS.

The transport model developed in the STREAMS project was used for a pilot Strategic Environmental Assessment (SEA) of the Trans-European Transport Network (TETNs) requested by the European Commission. The aim of the SEA work was to obtain an indication of the impacts of the TETNs, including their broad geographical distributions, in terms of energy, emissions and traffic safety.

The pilot assessment was based on work made under the Fourth framework research programme, from the SCENARIOS, STREAMS, MEET, and COMMUTE projects.

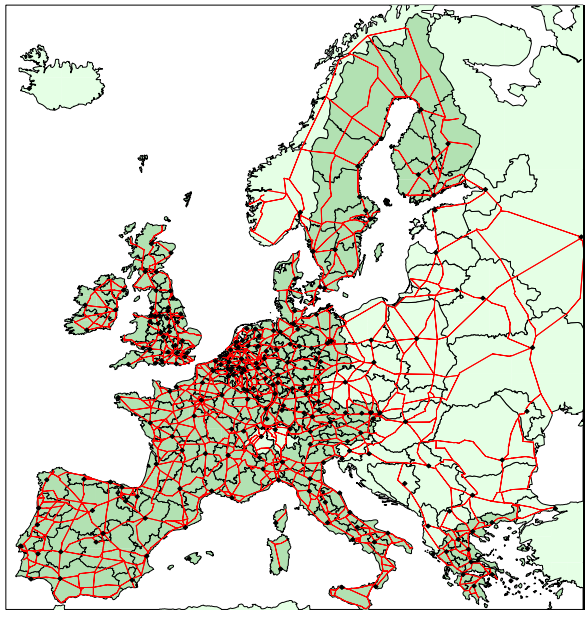
Model design principles

The STREAMS model aims to provide medium to longer term forecasts of changes in transport demand. This implies that the model structure should be based on the need to understand why and how travel demand tends to grow over time.

The model structure should also be based on assumptions about what policy options the model would be required to test and what outputs would be expected.

These considerations led to a set of design principles, on the treatment of short trips, the segmentation of the model, and the approach to including transport networks. For instance, one option in a strategic model is to include only certain types of trips, such as long distance trips. It was decided in the STREAMS project to model all trips, of whatever length, partly for technical reasons to provide a more stable basis for forecasting and partly because there would be policy interest in seeing EU transport as a 'whole'. By definition this means that in a model with NUTS2 zoning, a large proportion of trips will be within zones. This in turn implied the need to improve the treatment of intrazonal trips compared to their treatment in most transport models.

The STREAMS Network



Both the passenger and freight demand modules are based on the need to understand why travel demand tends to grow over time. For the passenger model this meant a detailed representation of traveller types and trip purposes.

For the freight model it meant using a Regional Economic Model to generate freight flows and segmenting these by industry type.

The actual transport infrastructure available to each line haul mode and to intermodal operations is represented by links. The links are categorised into link types, which makes the representation of the properties of the links (length, free flow speed) for each modal network easier. Transport service operations on these links are represented in travel stages, which correspond both to the vehicles and vessels on the line haul, and the handling operations at transfer and transhipment sites.

Transport services used by a complete journey from an origin to a destination zone for passengers or for freight are often made up of a number of network modes. Such combinations are defined as user modes (i.e., the primary mode of the journey as perceived by the user) and each user mode is built up with one main mode and a collection of feeder modes, in accordance with the actual stages of travel.

In the transport model the modal split procedure divides the trips among the different user modes available between a pair of zones.

The assignment subsequently takes the trips for a specific user mode and assigns them to the network mode (typically vehicle type) and then to the links that are traversed in moving from the origin to the destination for each of the travel stages included in the user mode.

This representation allows trips to be represented in a realistic manner. For example, flows fed by lorry into coastal shipping have coastal shipping as their main network mode, lorry being a feeder mode.

The STREAMS model comprises 232 zones which correspond to NUTS2 or below for EU15 countries, together with a representation of the rest of the world as external zone.

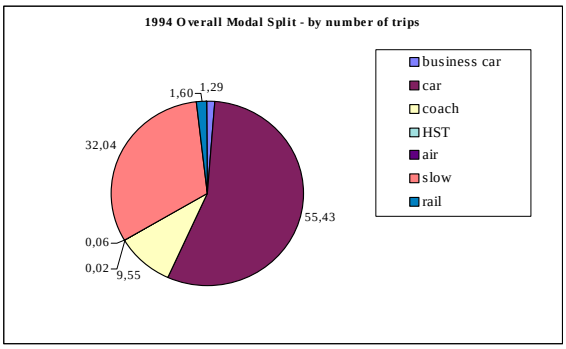
The STREAMS model was calibrated at the base year 1994 and validated against observed data of national and international traffic by country and purpose of the trips. Observed data was drawn from EUROSTAT statistics plus other national sources.

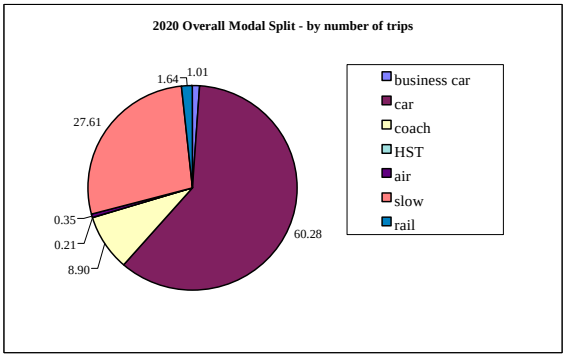
The freight model includes 10 transport modes (short distance and long distance trucks, bulk rail, shuttle container rail, bulk inland waterways, container inland waterway, bulk shipping, container shipping, air freight and pipelines) and 10 different freight categories (6 bulk or general cargo flows and 4 unitised flows) based on the NST/R classification.

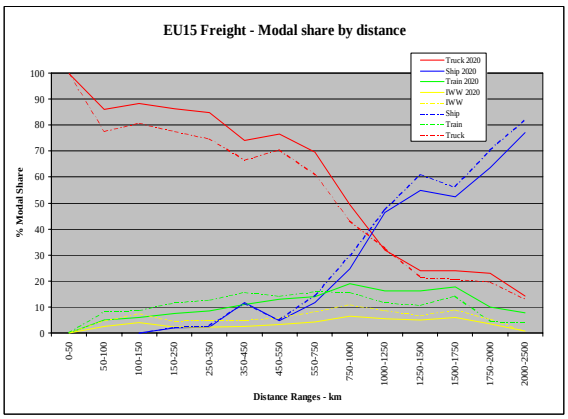
During the calibration and validation process, TRT built a database of the observed freight traffic at the base year, in a consistent format with the model requirements.

The database was built starting from the EUROSTAT *External Trade by Mode of Transport* and *Carriage of Goods* databases integrated and corrected with additional information drawn from national statistics. Also cost functions for each mode of transport were estimated.

An example of the STREAMS passenger model outcome







The consortium

The international consortium which carried out the study was led by Marcial Echenique & Partners (UK). The other partners were TRT Trasporti e Territorio, LT Consultants Ltd (FI), Marcial Echenique y Compañia (ES) and IRPUD Universität Dortmund (DE). In the STREAMS project TRT was the partner responsible for freight transport model design, calibration and validation.