

ULTISIM (Urban Land Transport Integrated micro-SIMulation model) : towards a european LUTI micro-simulation model. First stage

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Abstract

Among the Land Use Transport Integrated (LUTI) models, the dynamic micro-simulation models are the most data-demanding. This type of model requires a huge amount of data, as well for input as for econometric estimation in order to parameter the different sub-models. Currently, the world widely reference is the american tool OPUS/UrbanSim developed at the University of Washington, which was designed specifically for american metropolitan areas and not for european cases. It has been applied on Paris Region (project SIMAURIF) and on the metro area of Lyon (project SIMBAD) in France. These two projects have shown the big difficulty to transpose an American model to French urban areas. Furthermore, OPUS/Urbansim is not really a LUTI model, in the sense that you have to connect it to an existing transport model. So the goal of our project ULTISIM (Urban Land Transport Integrated micro-SIMulation model) is to develop a new integrated micro-simulation model adapted to European metro areas and fully integrated. The project is led by three partners : IAU îdF (leader, France), Polytechnico di Torino – Laboratory Laq/TIP (Italy) and the institute Significance (the Netherlands).

The first stage of this project concerns mainly the question of input data and estimation data necessary to parameter the different sub-models. At first, we describe the general context and the new stakes of traffic modelling in France, in Italy and in the Netherlands. We make a review of the different categories of land use transport integrated (LUTI) models. Then, three case studies are analyzed : Paris Region (Île-de-France), the urban area of Torino, and the Randstad (a metro area including Amsterdam, Rotterdam, The Hague and Utrecht). We draw lessons from these comparisons and through an in-depth analysis, we elaborate the architecture of a fully integrated land-use transport microsimulation model adapted to european large urban areas and then the specifications of the input data structure which conditions the methodology of any application.

The second stage will consist in the development of the software (first version). We'll particularly focus the development on four main points which are present in OPUS/Urbansim but not very well implemented according to us, hence the big difficulties for most Urbansim's users in the world to use the product : the linkages between the land use model and the traffic model, the linkages between the four different sub-models inside the land use package, the consistency between the trips purposes of the travel demand model and the data structure of the land use model, a user-friendly interface based either on MS Windows in a temporary version or on a web-based application (which is nowadays the trend), requiring no knowledge of computer languages such as Java or Python, but only knowledge of traffic modelling and econometrics.

Clearly, we aim to position ULTISIM (Urban Land Transport Integrated micro-SIMulation model) as an alternative to OPUS/Urbansim. The goal is to offer in Europe a product more suited to urban characteristics, modes shares, available data and addressed mainly to end users (practitioners, planning agencies, transport technical services). There is at least a real demand of such a tool in France.

We have developed a website for ULTISIM : www.iau-idf.fr/ultisim

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