DATA ACTUALIZATION IN MODEL-DRIVEN DECISION SUPPORT SYSTEM FOR TRANSPORT SYSTEM PLANNING

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The using of microscopic models repositories in model-driven decision-support system (DSS) allows one to get a comprehensive idea of the upcoming changes on the global and local level of urban transportation system (UTS) and assess the impact on their subsequent implementation, and as a result to improve decision-making by the responsible person (Barcelo, 1997; Ortuzar et al., 2006; Kergaye, 2010). Despite the obvious advantages the using of microscopic models as a part of DSS is poorly studied and they are rarely used due to the complexity of the model structure and its application, as well as high requirements to the data (Wood, 2012). Due to the fact that the main condition of transport models usage is the decision-making person’s trust in modelling results, and taking into account that at the micro-level the traffic properties and UTS network configuration are changing faster than at macro-level, both the data in databases and the models in repositories are needed for a more frequent actualization and calibration in spite of macroscopic model application. That’s why it is needed to propose the fast procedures for data actualisation.

The conception of regression models’ (RM) application for data actualization needed for model-driven DSS is offered in this research. The decision-maker solving the problems of UTS planning can face with two typical situations of data absence. It is necessary to repeat the investigation of UTS fragment on the basis of a previously created simulation model and with preliminary knowledge about changed situation. In this case an additional UTS survey for the data updating is typical decision for model actualization and usually it is quite expensive and time-consuming. The second typical situation concerns the need to estimate the influence of new solutions on one TS fragment on the neighbouring. The researcher can have the microscopic models of considered UTS fragments, but he hasn’t the possibility to connect them together to transmit the new volumes of traffic. The traditional solution of the highlighted problems is either expensive or it doesn’t exist at all.

The authors proposed the RM application for data actualization and new obtaining, and considered several task settings for realization of such approach:
• the data actualisation for MM of UTS fragments that are on one street and on different ones;
• the data obtaining for analysis of new solutions’ influence on the neighbouring fragments of UTS (both for UTS fragments located at the same level (road) and the different one).

The approach has been approved using the simulation model that was constructed in the frame of the project “Pedestrian and Transport Flows Analysis for Pedestrian Street Creation in Riga City” (Yatskiv et al., 2011). The offered procedures on the basis of regression models can be used in the frame of model-driven DSS and give the possibility to fulfil the process of model actualization faster and less expensive without loss of accuracy.
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