

MODEL OF THE TRANSPORT NODE KRASTA STREET-MASKAVAS STREET-SLAVU BRIDGE WITH THREE LEVEL TRESTLE

Problem definition

The out-of-date layout of Riga city and its transport system do not satisfy today's needs of the population for travelling. At present there are 3 bridges over the Daugava river. Those bridges are concentrated in Riga centre and it leads to the Riga's centre overloading. That is why the new bridge construction called Dienvidu Tilts (the Southern Bridge) started in 2006. The 1 stage of Southern Bridge project envisages the building of the Southern Bridge and its trestles over Krasta Street and Maskavas Street by the summer of 2008. It is important to note that trestle will be the first three-level transport structure ever built in Latvia. *The main tasks of the project are:*

- * Simulation models development of the transport node Krasta Street - Maskavas Street - Slavu Bridge, which also includes three-level trestles;
- * Analysis of the former and future states with transport flows in this transport node, which was indicated on the second place in 2004 according to work-load (104% on the basis of the ICU method) and is being reconstructed at present;
- * Development of animation film in 3D.

Proceeding

At first, the simulation model for this node using package VISSIM 4.3 family PTV Vision was constructed. This model was based on the real traffic measurements in this area and on the forecast data of the traffic volume in 2012. The traffic characteristics of the renovating transport node are investigated and compared to the traffic characteristics of this node in 2004.

Numerical characteristics of the realized model:

- * 465 fragments in the simulation model.
- * 20 points of traffic sources, 13 of them being the sources of vehicle flow and 7 of them – the sources of the pedestrians and bikes flow.
- * 68 decision points
- * 7 priority rules and 49 conflicted zones
- * 3 groups of traffic lights were described

- * Main speed at intersection – 50 km/h, but there exist few zones with the speed of 70 km/h.
- * 32 desired speed decisions objects.
- * Data Collection Points - 36
- * Queue Counters - 17.

The key differences of experiments are architectural decisions on the organization of the transport node, distinctions on the volumes of traffic and distribution of flows to directions. The following groups of measures and their descriptive statistics should be noted: delay time per vehicle on the areas of this transport node, travel time on the problematic routes (for key trends), carrying capacity of this transport node; queue lengths on some intersections were examined. These results were compared to the results of functioning of this transport node model based on data of 2004.

It is possible to mark on the basis of experiment results that the time of delay in the area of this transport node and stops will decrease, the average speed will grow more than by two times, the amount of the vehicles getting through the transport network per model hour will grow by 25 times, the average time of delay per one vehicle will decrease by 2.5 times.

Results

The performed investigation concerns the complex transport node in Riga: Krasta street - Maskavas street - Slavu bridge, where loading can be increased dramatically during next years. The most problematic directions of the transport movements in this node are considered according to the forecasted volume of traffic for 2012 year.

The result of the project is the simulation model of the transport node that allows to carry on experiments in future. These experiments could include: traffic flow optimal organization, traffic light mode screening etc. The developed 3D animation video clip of the model for 2012 is also the instrument for demonstrating the evident transport node processes.

It is necessary to notice that the thorough analysis of the situation in the areas of the transport node Krasta street - Maskavas street - Slavu bridge will be conducted on the basis of the complex model, including Slavu bridge and three-level trestle Slavu.

