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MODERNIZATION OF STREAT ROAD NETWORK IN ANYLOGIC 7

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Abstract. This article discusses a problem that today in large cities like Tomsk has a problem with traffic jams. The goal of this article is to show the best solution may be to optimize the current road network by changing the operation of traffic lights, cars traffic patterns. This method will minimize costs, thanks to a preliminary modeling options and assessing their impact. AnyLogic is simulation tool that supports all the most common simulation methodologies that allows you to build such model, and to evaluate it.

Keywords: AnyLogic, traffic jam, modeling, simulation, system of Automatic Traffic Control.

Introduction. In our days large cities like a Tomsk has a problem with transport planning (traffic jam, congestion) associated with a sharply increasing number of vehicles. Also do not forget about the historical heritage. Architects, who are planed the city 400 years ago, could not imagine that the city will face with transport difficulties.

The one of the main solution for this problem is a full reconstruction of current road network at the macro level. It means that this solution needed the great amount of resources like money and time. Money is the main problem of this solution, because their amount which is needed for this solution is more than budget of the Tomsk region. Second solution is integration of Automatic Traffic Control Systems on existing road network. These systems consist of cameras, radars and road weather station which are connected in one network and work under one program. This program collecting data and analyze current situation on the road network. Special modules can optimize the work of traffic lights for solving problem with traffic jams or congestions. [3]

These two solutions needed grate amount of money and time, but what can we do now, today?

Modeling traffic network in AnyLogic 7. Simulation modeling is the third solution, which can help to reduce the load of traffic nodes without rebuilding existing traffic network.

AnyLogic is the only simulation tool that supports all the most common simulation methodologies in place today: System Dynamics, Process-centric (AKA Discrete Event), and Agent Based modeling. [2] The unique flexibility of the modeling language enables the user to capture the complexity and

heterogeneity of business, economic and social systems to any desired level of detail. It's mean that in the future we can go from micro level of model to the macro, without any difficulties. [4]

For the beginning, we need the data about most load nodes and time then it's happened. Problem nodes were identified with help of "Яндекс.Пробки" service. At the next step we collect the real data of problem nods load. We count the number of cars per unit of time, with 15 minutes interval. After that collected data were installed in AnyLogic model. [1] (Example of running model on fig. 1, left part)

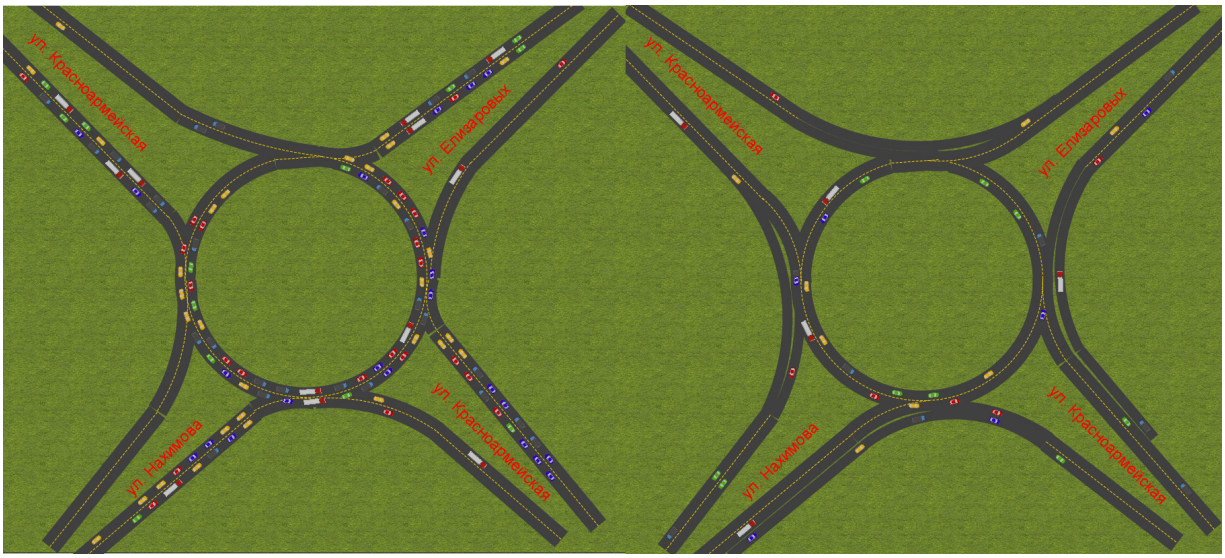

Fig. 1. Model Ring Road before and after the upgrade

Model was upgraded as we can see on fig. 1 at the right side. Load of this node was decreased and the capacity of this node increased on 25 % according model statistic.

Summary. In the concussion we can summarized that The AnyLogic allows not only create the model of road network, but also test them before implementation.

By using AnyLogic we have main features:

- Less cost of implementation
- Predicted results
- Can try all variants on model and choose the best of them

Thus Anylogic is the most appropriate tool for the problem which we try to describe in this article.

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