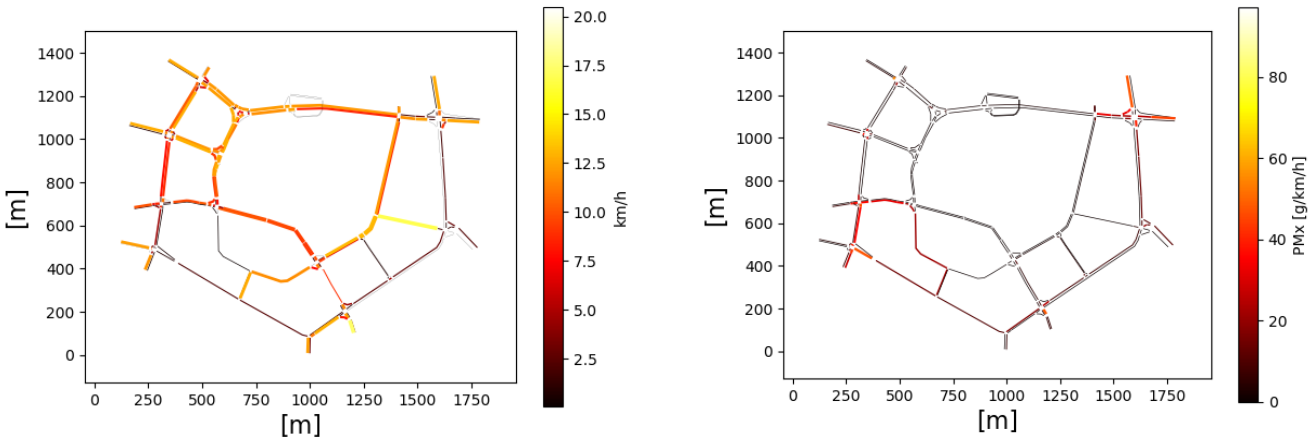
Urban traffic simulation for smarter and greener cities

Sasho Gramatikov, Igor Mishkovski and Milosh Jovanovik
Faculty of Computer Science and Engineering
Ss. Cyril and Methodius University
Skopje, Macedonia

ABSTRACT

Transportation is one of the main concerns of the big cities because vehicles are one of the top sources of air pollution. Despite this fact, many big cities follow a trend of growth of the number of vehicles that circulate on the road networks. In order to meet the demand, the authorities are obliged to increase the roads capacity or build new road infrastructure. However, this solution does not significantly contribute to pollution reduction and traffic jams, especially in the weekdays peak hours. One solution to respond to the travel demand and reduce the vehicle number is the concept of car sharing where more passengers with similar travel route share a vehicle.

The goal of our work is to estimate the effect that the car sharing service would have on the overall traffic in urban areas by means of simulation. As an initial point, our goal is to create a simulation environment based on real traffic data data that can be further used for analysis of the effect of different solutions. We use the SUMO, a traffic simulator which uses a network of interconnected edges, traffic lights and traffic demand to create a microscopic simulation of vehicle movement. We use some of the features of the simulator to download an urban area from Open Street Map and convert it into network compatible for traffic simulation. As a traffic demand we use data obtained data from inductive loops in the central area of the city of Skopje. The data contains a number of vehicles that pass each hour during 24 hours during the month of November 2017. We choose the data from the first Monday of the month since the traffic is most dense in weekdays. The data is used as input of a DFROUTER tool which generates possible routes for the network and flows of vehicles that meet the input induction-loops



(a) *(b)*

Figure 1: (a) Out-bound and (b) in-bound traffic for different packet loss probabilities for segments with duration of 2 seconds

ACKNOWLEDGMENT

The author thanks the Faculty of computer science and engineering at the Ss. Cyril and Methodius University in Skopje, under the IACT “Influence of Autonomous Connected Transport in Urban Areas” project for financial support