NEW POSSIBILITIES IN TRAFFIC MANAGEMENT IN THE CITY ROAD NETWORK

Vasilij Shuts

Brest State Technical University
Moscovskaia str. 267, Brest, Belarus
E-mail: lucking@mail.ru

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Annually increasing growth of transport leads to deterioration of the efficiency of the transport system; increases the amount of congestion situations not effectively used roadbed. There are several ways to solve the problems: the expansion and modernization of highways (the most effective and expensive), the improvement of traffic management systems (development and optimisation of traffic light control, adaptive control (Anfilets and Shuts, 2010), etc.), new methods of driving flow control. Improvement and optimisation of transport systems and means of traffic control often doesn't bring significant benefits, but usually costly. So, it may be more efficient to optimise behaviour of drivers (Kasyanik and Shuts, 2012). Implementation of such system is carried out using the existing infrastructure of mobile devices that are now almost everyone. Practice shows that the introduction of smart managing crossroads is expensive and time-consuming task. New approach is needed to optimise traffic. Instead of adjusting the transport system for traffic flows, we can inform drivers in real time about the situation at intersections with traffic lights and allow drivers adapt to the green signal lights.

Widespread smartphones, navigators and other devices with built-in GPS receiver allows you to capture a significant percentage of drivers and invite them to use our system called "Mobile driver's assistant".

As part of the road network, vehicles fitted with mobile assistant driver, can be seen as autonomous agents. Traffic in the city will be a multiagent environment (Mikhnevich and Shuts, 2012). Knowledge of location, direction and speed of each agent can move us to a new type of traffic control.

The driver starts with a traffic light only to slow down after 500 meters. Even if the road is empty, traffic lights make us wait for the green light - there are typical problems of "foolish" road infrastructure. Intelligent prediction of times of traffic lights switching is able to save a lot of fuel in town cycle because the driver stops less often and engine idles not so much. It's better for driver to know how fast he must move to get on the green light. This project provides such opportunity.

There are several automobile consortiums that developing technology for universal road "data bus" which could support all vehicles as well as traffic lights and other road facilities. For example, the "Audi" company announced details about the technology "Audi Travolution" recently (MIT News Office, 2011), which displays the driver's distance from the nearest traffic light and recommended speed.

So, the car can increase the speed of itself, if not falls into so called "green wave on the contrary it can signal the driver of imminent signal changing (visual or acoustic alert or by brief interruption of the gas pedal).

Tests have shown that the machine saves an average of 20 ml of gas at every traffic light by using such a system. Surely, Audi is not the only company that is working on the creation of "automobile internet". A program called "Safe Intelligent Mobility-Test Area Germany" (SIM-TD) is experiencing now in Germany by a consortium involving Audi, BMW, Daimler, Ford, General Motors, Volkswagen, Opel, Bosch and Continental (MIT News Office, 2011).

Proposed in the given work system for non-stop passage of the road network includes a mobile communication device or another mobile driver's assistant (let's call them MDA), which is located in the vehicle and connected across the WAN with a server computer, that is connected to the city traffic lights control centre. These devices are equipped with special software that performs the necessary calculations. Such a design allows using the software for non-stop passage of the road network on any vehicle without costly upgrades of traffic lights.

The system works as follows: the server computer has permanent access to information about current traffic signals and their location. MDA are turning to the server computer for the geocoded information about the parameters of traffic lights, when required. Using the parameters of its current location and received data, MDA calculates the optimum speed of unceasing movement to the next traffic lights and then outputs the information to the driver. The driver performs non-stop passage, following the recommended speed. Such system takes into account the relevant parameters of both basic and additional sections of traffic lights and recommends speed for all possible directions (Kasyanik and Shuts, 2012).

Using such systems at traffic lights significantly reduces transport stops, safety of both vehicles and pedestrians is ensured.

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