9. Транспорт

**THE INFLUENCE OF FACTORS ON THE PROCESS OF GETTING OF SPECIAL VEHICLES TO THE PLACE OF AN EMERGENCY CALL**

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The rapid growth of motorization requires a systematic approach to ensure the functioning of the field of road traffic. The basis of this approach is the study of connections and dependencies in the system «Road conditions – traffic flows». It is known that speed is the most important parameter of a traffic flow and determines the traffic performance. However, along with the speed, the first of two main target traffic functions is still traffic safety. For the accomplishment of tasks related to salvation and provision of assistance, special vehicles (SV) of operational services (fire rescue, ambulance, emergency gas service, police, etc.) should be able to move quickly and safely in difficult road transport conditions [1]. However, the growth of motorization causes over-saturation of the road network (RN) by vehicles, which significantly influences the main parameters of the traffic flow, in particular, on speed, density and traffic intensity. Therefore, the specified requirements for the movement of SV can’t always be combined in practice.

Unfortunately, today's well-known scientific works rarely focus their attention on analyzing the behavior of SV in the system «Road conditions – traffic flows», which will enable to distinguish factors that influence the process of following the SV to the place of an emergency call. An analysis of the scientific works of Ukrainian scientists related to the above-mentioned problems is given in [2, 3]. As far as foreign experience is concerned, in [4], for predicting the duration of SV follow-up, factors such as the traffic flow rate, the number of lanes on the highway network and the average speed of the traffic flow are taken into account. The study [5] examines the simulation of the movement of SV, given that they are allowed to deviate from some requirements of traffic rules, for example, to travel to the traffic signal forbidden. However, in these works insufficient attention is paid to the process of influence of factors (for example, the arrangement of RN, its characteristics, parameters of traffic flows, technical means of the organization of traffic) on the duration of follow-up of the SV to the place of an emergency call and safety of their movement.

Do not forget that the speed on the RN also affect the road conditions. However, on highway suburban roads and high-speed urban roads, only the geometric parameters of roads influence the speed of traffic, while in urban streets there is an intersection, pedestrian crossings, parked transport, and so on. It is also evident that the quality is affected by the quality of the coating, the width of the stripes and the verge, the radii of curves, the visibility, the height of the curbstone, etc. Therefore, it is not necessary to reject these factors also when evaluating the parameters of the movement of SV.

In order to provide SV with optimal traffic conditions, it is necessary to identify them among other road users due to special sound and light signals. In some countries, an attempt was made to provide a «green wave» to SV at regulated intersections. Today, such schemes are implemented in the United States, where traffic lights can have an additional white section, which is activated in the event of the SV being followed by the call point and provides a stopover of the traffic flow in the three adjoining neighborhoods.

In conclusion, in view of the above, it is necessary to continue to study in detail the interaction between the individual components of the «Road conditions – traffic flows» system and to find effective measures for its improvement. This, in turn, will make it possible to more effectively manage the SV in the context of the outlined issues.

Literature:

1. Pasnak I. (2015) Rozkrittya osoblivostey vplivu parametriv vulichno-dorozhnoyi merezhi na trivalist sliduvannya ta bezpeku ruhu spetsialnih transportnih zasobiv. Scientific Journal of LSULS, no. 12, pp. 209-216.

2. Pasnak I. Development of algorithms for efficient management of fire rescue units / I. Pasnak, O. Prydatko, A. Gavrilyk // EasternEuropean Journal of Enterprise Technologies, Vol 3, No 3(81) (2016): Control processes, pp. 22-28.

3. Pasnak I., Prydatko O., Gavrilyk A., Kolesnikova A., Gangyr Y. (2016) Analiz chynnykiv vplyvu na tryvalist sliduvannia pozhezhnoho avtomobilia do mistsia vyklyku. Scientific Journal of National Forestry University of Ukraine, no. 26.1, pp. 286-291.

4. Jiawen W. Travel time estimation model for emergency vehicles under preemption control / W. Jiawen, Y. Meiping, M. Wanjing, Y. Xiaoguang // [Procedia – Social and Behavioral Sciences](http://www.sciencedirect.com/science/journal/18770428). – 2013. – Vol. 96. – P. 2147–2158.

5. Yi-Sheng H. A traffic signal control policy for emergency vehicles preemption using Timed Petri nets / H. Yi-Sheng, S. Jang-Yi, L. Jiliang // [IFAC-PapersOnLine](http://www.sciencedirect.com/science/journal/24058963). – 2015. – Vol. 48. – P. 2183–2188.