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ONLINE MONITORING SYSTEM OF TECHNICAL CONDITION AND AS A MEANS OF BUS LOAD MONITORING OF THE SAFETY OF PASSENGER TRAFFIC

Since 2013 the Sectoral program of ensuring the road safety has been carried out in Ukraine.

The aim of the Sectoral program is to improve situation in the sphere of road safety in Ukraine (especially in the performance of commercial road transportation), reduction in accident rate, the number of accidents and the severity of the consequences they lead to, ensuring the acceptable level of safety carriage of passengers and goods by road through the implementation of measures to improve the state road safety.

The Sectoral program aims at complex problem solving related to road safety, the priority of life and health of motoric public.

The main tasks of the Sectoral program in relation to the ensuring the technical condition and safety of the buses are:

- implementation of safety management systems in road transport traffic and prevent accident rate;
- ensuring the compliance with requirements of legislation on the mode of work and rest of drivers of transport vehicles.

Thereby we propose the expansion of the system of online monitoring of vehicles in order to increase the number of controlled parameters that affect the safety of passenger traffic (Fig. 1).

Axle load sensor with special installation scheme in the suspension elements provides a measurement of the load on each wheel. At the interaction with pressure and temperature sensor in the tires, the calculation of resistance motions and coupling properties wheel engine is. These indicators together with indicators of temperature sensor of brake pads and automotive radar short-acting allow to determine the stopping distance interval security, stability and bus manageability that directly affects the safety of the bus in the transport stream.

The choice of automotive radar of short-acting is justified by speed limits and distance to previous vehicle in the transport stream.

Driver identification system and tachograph carry out the supervision of work and rest regimes of the driver of the vehicle. Driver identification system combined with a designed set allows estimating the professional skills of the driver in compliance with the rules of eco driving.

The data is processed with the help of the tracker and the computing module and provide information to the driver about driving a vehicle safety and is transmitted to the analytical center of road safety and passenger traffic by GSM communication channels where analyzed.

Wear and temperature sensor of brake pads allows to perform technical maintenance of brakes when reaching the limit roadworthiness that reduces the cost of maintenance and operation of the bus.

Information driver monitor can display the load of passenger compartment relatively to the passport load, the effectiveness of the brakes and approaching temperatures of brake mechanism to critical point.

Automotive radar added to the system allows calculating the recommended speed with the safety interval and displaying it on the driver monitor.

Analytical center may give the recommendations to the driver as to the speed for the prevention of deviation schedules including those when changing situation on the route.

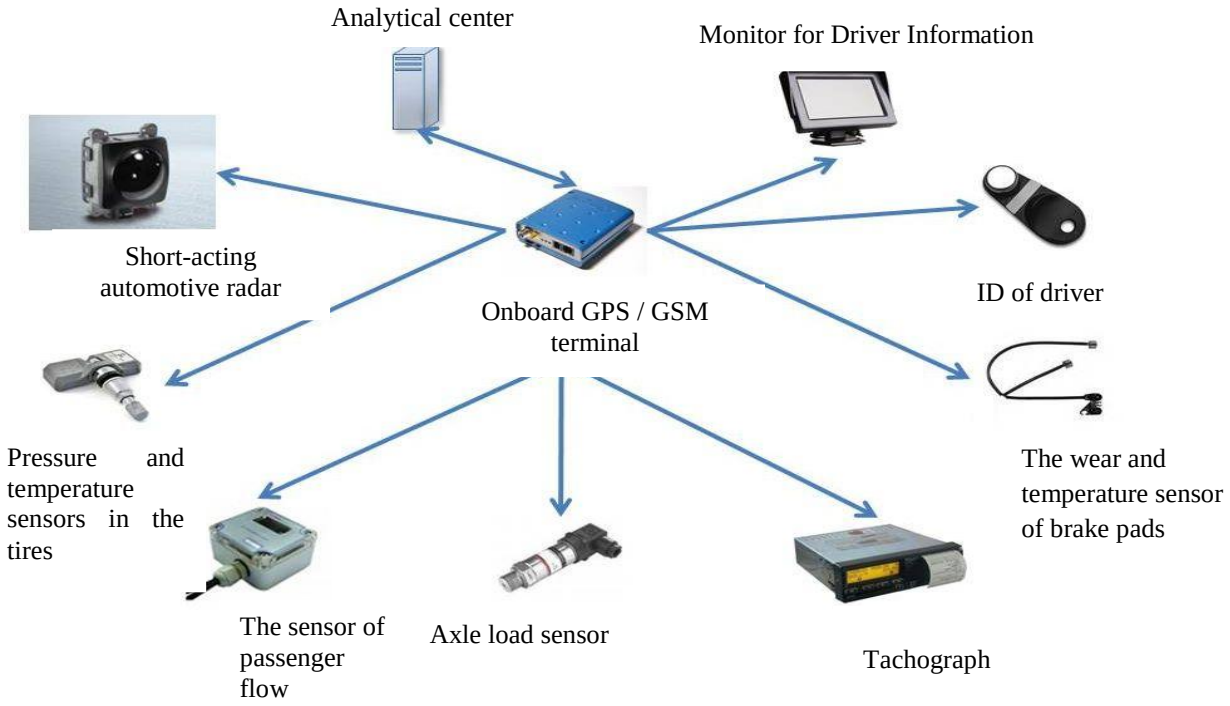

Fig. 1. Scheme of online monitoring system of wheeled passenger transport

Conclusion: Designed system of monitoring allows the driver to obtain information concerning the recommended speed with maintenance of safety interval in the transport stream for the actual technical condition and the bus load and prevent malfunctions of the braking system at runtime of passenger traffic.