Topics of dissertations for the admission procedure
to the doctoral program
at the CTU in Prague Faculty of Transportation Sciences

Commencement of Study: March 1, 2025

Department of Applied Mathematics (K611)

Study programme: Smart Cities

Supervisor: **Prof. Ing. Ondřej Přibyl, Ph.D.**	
Topic: **Integration of cooperative and automated vehicles into traffic management**	
Research topic is agreed with supervisor	**Language:** English
Abstract: **Cooperative and automated cooperative vehicles (CAVs) are facing an enormous growth in both research and commercial projects. However, there is still limited knowledge of how to manage properly CAVs and how to integrate them into traffic and urban management. As part of this work, the student designs and implements algorithms for traffic control and optimization in the network with regard to autonomous vehicles.** **The topic is thus focusing on distributed traffic control methods using multi-agent systems. The algorithms will include topics such as load balancing in the network (using routing), recommendations for changing the speed with regard to the green wave and traffic harmonisation, and others. As part of this work, the possibilities will be analyzed and new algorithms will be designed and further verified using simulation tools to determine their impact on transport and the environment.**	
References: **Přibyl, O.; Blokpoel, R.; Matowicki, M. Addressing EU climate targets: Reducing CO2 emissions using cooperative and automated vehicles. Transportation Research Part D: Transport and Environment. 2020, 2020(86), ISSN 1361-9209.** **Vreeswijk, J., Přibyl, O., Blokpoel, R., Schindler, J., Rondinonee, M. (2017). Managing automated vehicle at signalized intersections. In Proceedings: International Conference on Intelligent Transport Systems in Theory and Practice, mobil.TUM, Munich.** **Blokpoel, R., Lu, M. (2018). Cooperative systems for future automated road transport and traffic management in urban areas. In Proceedings: The 7th Transport Research Arena (TRA), 16-19 April 2018, Vienna. Lu, M. (Ed.) (2019). Cooperative Intelligent Transport Systems: Towards High-Level Automated Driving. IET (Institution of Engineering and Technology), London.**	
Number of doctoral students: 2	
Form of study: full-time	