

Workshop title

Traffic Management for Future Mobility – CAVs in a Mixed Traffic Environment

Workshop proposer(s)

Andreas Malikopoulos*, Ioannis Papamichail

Abstract

The goals of an “efficient” transportation system are to alleviate congestion, reduce energy use and emissions, and improve safety. The deep integration of technology in the transportation sector is providing fundamentally new methods to manage the flow of goods and people in the next generation transportation systems. Core disruptive technologies include vehicle connectivity, vehicle automation, and the notion of shared personalized transportation infrastructure enabled by mobility on demand systems. The central challenge is to develop smarter transportation systems to connect communities and increase access, without also increasing the negative consequences of transportation (e.g., emissions, energy consumption, and congestion). Connected and automated vehicles (CAVs) provide the most intriguing opportunity for enabling users (including individual vehicles and traffic control centers) to better monitor transportation network conditions and make better operating decisions to improve safety and reduce pollution, energy consumption, and travel delays. It seems clear that the availability of vehicle-to-vehicle communication has the potential to reduce traffic accidents and ease congestion by enabling vehicles to more rapidly account for changes in their mutual environment. Likewise, vehicle-to-infrastructure communication, e.g., communication with traffic control centers, nearby buildings, and traffic lights, should allow for individual vehicle control systems to account for unpredictable changes in local infrastructure but also to receive guidance from the infrastructure. A massive deployment of CAVs requires overcoming significant challenges. However, CAVs will penetrate the market incrementally and will interact with human-driven vehicles. As transportation systems become increasingly complex with an expanded feature space, new approaches are needed to understand the impact on system behavior that would result in an energy- efficient mobility system. The workshop intends to stimulate a discussion on a research roadmap for improving traffic management using emerging mobility systems.

Keywords

- Road Traffic Control
- Automated Vehicle Operation, Motion Planning, Navigation
- Network Management

Topics of interest

- Traffic management
- Emerging mobility systems
- Artificial intelligence (AI) methods for improving traffic flow
- Classification of smart infrastructures