

Workshop title

Network Impacts of Emerging Mobility Trends

Workshop proposer(s)

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Abstract

This workshop aims to give insight into various network modeling methods and their applications to emerging mobility trends. Digitalization and technical inventions transformed and will continue to transform the mobility sector. On the technical side, connected autonomous vehicles are expected to drive on the street network and even fly through the air in the near future. The population's attitude towards mobility also changes as the widespread availability of mobile internet enhances the popularity of mobility services. Whereas the possession of a private vehicle or bicycle was required to use these modes of transport in the past, the sharing industry will likely enable a large share of the population access to these new modes of transportation.

Transportation network models need to incorporate the changes on the demand and supply side. On the supply side, connected autonomous vehicles have the potential to increase network flow by reduced headways, better intersection control or even new flow concepts.

Furthermore, an optimized design and operation of shared vehicle fleets enables mobility service providers to offer transportation on parts of the network for an affordable price. With the additional mobility services and real-time information about their service level and the traffic system at hand, travelers can make complex decisions from a larger set of viable options. As the user convenience between private vehicle and mobility services become more similar and the private vehicle might be unpractical for one leg of a journey, travelers also have to plan whole trip chains.

In order to understand and optimize the network impacts of emerging mobility modes, the interaction of demand and supply needs to be modeled. Increased vehicle throughput can decrease travel times and induce more car traffic, better mobility as a service offers can decrease private vehicle ownership, but also decrease the ridership and profitability of conventional public transport. Models are necessary to estimate effects of emerging trends and various ways to regulate the transportation network.

Keywords

- Network Modeling
- Multi-autonomous Vehicle Studies, Models, Techniques and Simulations
- Theory and Models for Optimization and Control

Topics of interest

- Data acquisition and requirements to model demand and supply
- Advanced modeling of demand: trip chains, intermodal transportation



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- Advanced modeling of supply: connected autonomous vehicles, shared ground/air-based vehicle fleets
- Interaction of demand and supply