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Optimising the design of a hybrid urban mobility system

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Mobility as a Service (MaaS) platforms allow users to plan, book and pay for trips that may involve a combination of multiple modes, including public transport (PT), demandresponsive shared taxis (DRT), bikesharing (BS) and walking. This project focuses primarily on the design of such a hybrid mobility system, which requires a number of decisions (PT lines and frequencies, location and size of the BS stations, DRT fleet size) that are interdependent, but traditionally taken by the different service providers separately. This project takes the perspective of an urban mobility department that wants to facilitate the development of a coherent, cost-efficient and high-quality system. Optimally exploiting synergies between modes decreases the providers' dependence on public funding, while it also reduces transport poverty, congestion and emissions. The methodological challenge of these design decisions is to predict or analyse their impact on the operational costs and the service level upon implementation. Hence, operational optimisation algorithms for hybrid mobility systems will also be developed and integrated into the design optimisation approach. These algorithms are another fundamental contribution and can be applied as decision support tools by companies. The project specifically focuses on an urban context because of the practical urgency (increasing congestion and emissions) and methodological challenges arising from a large demand.