Routing and scheduling algorithms for integrated mobility systems with dynamic and stochastic characteristics

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This research focuses on the integration of different transportation modes, more in particular, the integration of timetabled public transport (PT) and dial-a-ride (DAR) services. This allows passengers to travel by a combination of these two modes and results in a more flexible and efficient mobility system. Users can submit a single transportation request for their entire trip, indicating their service requirements(e.g., time windows, maximum trip duration, …). Next, the routes and schedules of the DAR services are planned by a mobility provider. They must be aligned to the PT timetables to allow efficient transfers and take into account the users' service level by avoiding large detours and long waiting times during transfers. From the perspective of the mobility provider, the exploitation of such an integrated mobility system leads to challenging routing and scheduling problems on the operational level. Therefore, in this research the main goal is to develop a more efficient, cost-effective, and reliable planning algorithm that takes into account real-life dynamic and stochastic characteristics.