



Research School for Operations  
Management and Logistics

**On demand transportation: Dynamic vehicle routing problems and solution methods**

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In on demand transportation systems, a fleet of vehicles is used to attend transportation requests for moving passengers or freight from a pickup location to a delivery location. If the requests arrive dynamically, the routing of the vehicles needs to be performed in an on-line fashion in order to meet demand. Recent developments in information and communication technologies (such as GPS, GIS, Internet of things) make real-time communication between vehicles and a coordination central possible, and such a dynamic routing solution can be used in real world applications. Moreover, with the emergence of technology aimed at enable autonomous, driverless vehicles in the near future, new transportation logistics challenges will emerge. For example, fleet management operations will need to coordinate thousands of vehicles and serve an even bigger number of requests. The aim of the project is to investigate innovative approaches for solving dynamic vehicle routing problems for the transportation of people and goods. First, we address problems considering settings where the dynamic information is revealed under no stochasticity. Second, we address a more complex variant wherein additional information is revealed, such as network disruptions, congestion, service time, etc. In particular, we are interest in the interplay between methods in approximate dynamic programming, stochastic programming models and meta-heuristic solutions to address the underlying optimization problems.