

The impact of time window design on order fulfillment in attended home delivery

In recent years, e-commerce is continuously growing, and new business models and services are entering the home delivery market. For example, in the case of e-grocery, on-demand startups promise 'instant' grocery delivery within a few minutes. This innovative service offering challenges many assumptions of existing fulfillment strategies. The term "attended home delivery" (AHD) refers to fulfillment strategies that require the customer to be at home to receive the ordered goods. To ensure successful delivery, service providers usually offer a selection of time windows from which the customer can choose. An efficient fulfillment of multiple customer orders can then be determined according to a vehicle routing problem with time windows (VRPTW). The selection of offered time windows thus has a direct impact on the creation of efficient delivery tours.

The goal of this thesis is first to synthesize the current state of research on the influence of offered time window selections on subsequent route planning. Second, the student should add new findings to the existing body of knowledge. This means that the student should (i) design an appropriate computational study, (ii) implement the study and generate numerical results (preferably in Python), and (iii) interpret the results and draw appropriate conclusions.