A Location-Routing Problem with Delivery Options and Time-Windows for the Last Mile Delivery of Fresh Products

Sonja Rohmer*[1], J.c. Gerdessen[1], and G.d.h. Claassen[1]

[1]Wageningen University - Operations Research and Logistics (WUR - ORL) – Netherlands

Abstract

This research presents a location-routing problem with delivery options for the last mile delivery of fresh products. Product delivery can occur either directly to the customer locations or indirectly to a customer pickup point, where they are stored until customer pickup takes place. Due to the fresh nature of the products, direct delivery requires customer attendance and is thus subject to tight time windows at the customer locations, whereas indirect delivery allows for more flexibility. However, pickup points are restricted in terms of capacity and require refrigeration, therefore incurring a cost related to the operation and cooling of the pickup facilities in use. The objective is to minimise the total transportation and storage cost. Formulating the problem as a mixed integer linear program and solving it by means of an adaptive large neighbourhood search, the research aims to investigate the potential benefits of implementing refrigerated pickup stations in last mile distribution systems for fresh products.

Keywords: Fresh Products, Alternative Delivery, Last Mile, City Logistics

*Speaker