
The location-routing covering problem

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Abstract

In this presentation, we introduce, model and solve the location-routing covering problem (LRCP). The LRCP is a variant of the location-routing problem and the covering tour problem. The problem consists of routing a set of homogeneous vehicles from a set of opened facilities to a subset of visited customers while ensuring that each unvisited customer is covered by exactly one visited customer. This problem arises for example in the context of healthcare supply chains in underserved regions where community health workers (CHWs) are recruited directly in their community and each CHW is restocked by a supervisor. In that context, the problem consists of determining the density and location of CHWs as well as the density, location and routing of the supervisors. To solve this problem, different mathematical formulations each with a different set of variables and a different set of constraints. To compare the performance of the different mathematical models, computational results will be presented on real-life instances for an application in Africa.

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