Reliable cooperative and backup covering in disaster situations.

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Abstract

This paper addresses a reliable facility location problem in which the possibility of facility disruption is considered. There are two types of candidate sites which differ from the reliability aspects. A combination of cooperative and backup coverage concepts are considered. It is assumed that customers can be covered by a combination of reliable and unreliable emergency centers in their primal coverage. Backup coverage is also considered for demands in which primal coverage is provided by unreliable centers. The proposed model aims to minimize the total costs, including fixed and expected transportation costs. The nonlinear formulation is resulted and is linearized by the necessary constraints. In addition, the abovementioned problem is solved by the GAMS optimization software, using a number of generated examples in order to demonstrate the performance of the model.