

# Equipments replacement planning in a telecommunications network

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## **Abstract**

Technologic breakthroughs are continually transforming the telecommunications industry and implying frequent upgrades of equipments. In this context, our purpose is to plan a massive change of facilities in a network made up with sites to which clients are connected. All clients linked to a given site must be connected to new cards at the same time, and the whole replacement process has to be done in a fixed number of periods. Furthermore, because of competition the number of clients at each period is decreasing. This specificity allows us to use again a card if it had been set up for a client who left afterwards. The problem consists in deciding for each period, which sites are upgraded, how many cards are bought and how many are reused, in order to minimize the total replacement cost. We present first a mixed integer linear program representing the problem and then we compare the exact resolution with our own heuristic adapted to the problem.

*Keywords:* Mixed integer programming, Planning, Heuristics.