
On the solution of the rolling stock rebalancing problem

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Abstract

In this talk, we deal with the Rolling Stock Rebalancing Problem (RSRP). In railways transportation, one of the objectives of the rolling stock planning is to match the train units stored at the shunt yards at the end of the daily operation with the train units required to perform the rolling stock plan on the following day. The scheduled plan is sometimes disrupted, and some stations may end up having a surplus or a deficit of train units at the end of the day. To solve the mismatch new empty trips can be scheduled. In this version of the RSRP we want to minimize the cost of these new empty trips while satisfying different sets of operational constraints imposed by the existing train timetables and the railway network. The complexity of the problem arises from the need to integrate decisions on the timetables of the new trains and the rolling stock units to reallocate. The literature on this version of the problem is quite scarce. We present a Mixed Integer Linear Programming formulation of the problem and show the computational results achieved on real-life instances provided by the main railway operator in the Netherlands.

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