Causal Analysis of Railway Running Delays

Operating delays and network propagation are inherent characteristics of railway operations. These are traditionally reduced by provision of time supplements or “slack” in railway timetables and operating plans. Supplement allocation policies must trade off reliability in the service commitments against service transit times and railway asset productivity. Methods to investigate the quality of supplement time allocation are necessary to reduce the behavioral response and the waste of resources. This is a preliminary study that investigates train delay data from the year 2014 supplied by Rail Net Denmark (the Danish infrastructure manager). The statistical analysis of the data identifies the minimum running times and the scheduled running time supplements and investigates the evolution of train delays along given train paths. An improved allocation of time supplements would result in smaller overall aggregate timetable supplement, reduced transport travel times, and higher productive utilization of train rolling stock. The study results will lead eventually to both better allocation of time supplements in timetable structures, and identification of areas that should be a high priority for correction.

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