Measures for track complexity and robustness of operation at stations

Stations are often limiting the capacity of a railway network. However, most capacity analysis methods focus on open line capacity. This paper presents methods to analyse and describe stations by the use of complexity and robustness measures at stations. Five methods to analyse infrastructure and operation at stations are developed in the paper. The first method is an adapted UIC 406 capacity method that can be used to analyse switch zones and platform tracks at stations with simple track layouts. The second method examines the need for platform tracks and the probability that arriving trains will not get a platform track immediately at arrival. The third method is a scalable method that analyses the conflicts and the infrastructure complexity in the switch zone(s). The fourth method can be used to examine the complexity and the expected robustness of timetables at a station. The last method analyses how optimal platform tracks are used by examining the arrival and departure patterns of the trains. The developed methods can be used to analyse a station to gain comprehensive knowledge about the capacity and complexity of the different elements at the station.

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