Railway Escape Velocity

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The borders of the agglomerations can be located by administrative units, but these limitations often do not reflect the borders of functional spaces. The aim of this paper is to show and apply a special locating method by the example of Budapest. The main idea is the motorway effect (the shortest way is generally not the quickest) applied to passenger railway traffic. The travelers of the agglomeration towards cities far from the capital have a choice: going back to the center and take a direct fast train *or* take a stop-train for getting to the first station out of the agglomeration where fast trains stop. We can terminate the settlements from where the return is quicker. This boundary can be perceived as the limit of the gravitational space of the main city. While in a given moment the best decision is clean-cut, the general definition may be based on a wide range of criteria. This choice results in a map of zones of the gravitational space, therefore our method is useful in the practical work of delimitation of tariff zones.

In the background study we introduce the "railway escape velocity" as a complex measure of frequency and relative speed of trains. With appropriate application of the physical one, we have to calibrate our model to be able to construct the possible time-space maps. We specify the problematic theoretical and empirical points, and demonstrate the possible solutions. From the theoretical point of view, we analyze the role of the mass, the center, the spreading of geographical entities, the measurement of distance, and the dynamic factor; and the choice of destination, of the starting time, the periodicity, and the questions of transfer as empirical corner-stones are inquired.

The final results are interesting findings in the regional science, but they are also useful in everyday practice of timetable construction.

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