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Inference of dynamic origin–destination matrices with trip and transfer status from individual smart card data

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Abstract

The provision of seamless public transport supply requires a complete understanding of the real traffic dynamics, comprising origin-to-destination multimodal mobility patterns along the transport network. However, most current solutions are centred on the volumetric analysis of passengers' flows, generally neglecting transfer, walking, and waiting needs, as well as the changes in the mobility patterns with the calendar and user profile. These challenges prevent a comprehensive assessment of the routing and scheduling vulnerabilities of (multimodal) public transport networks.

The research presented in this paper aims at addressing the above challenges by proposing a novel approach that extends dynamic Origin-Destination (OD) matrix inference to dynamic OD matrix inference with aggregated statistics, highlighting vulnerabilities and multimodal mobility patterns from individual trip record data.