

Traffic Assignment: Methods and Simulations for an Alternative Formulation of the Fixed Demand Problem

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Abstract

Motorists often face the dilemma of choosing the route enabling them to realise the fastest (i.e., shortest) journey time. The routes between an origin and destination might be a direct main road (higher capacity, shorter, but easily congested), a shorter route through narrow side streets through residential areas (often called rat-runs), or a nearby motorway or ring-road (longer but potentially faster). In this paper we examine discrete and continuous optimisation and equilibrium-type problems for a simplified traffic model. The various methodologies used for solving these problems (brute force, dynamic programming, tabu search, steepest descent) provide insights into the complexity of the problem, as well as insights into modelling real phenomena like road closures or efficient capacity building to an existing road network. This talk is based on a joint work with Stuart Berry, Sam O'Neill (University of Derby, UK), Nicolae Popovici (Babeş-Bolyai University, Romania) and Ramachandran Raja (Alagappa University, India).