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Effects of route guidance strategies on traffic emissions in intelligent transportation systems

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Abstract

This paper studied the effects of different route guidance strategies on traffic emissions in intelligent transportation systems. Six route guidance strategies were applied in three different two-route scenarios based on the Nagel-Schreckenberg cellular automaton model. The real data of traffic emissions under different vehicle operational modes were used. The simulations of the traffic emissions, the emissions per vehicle, the emissions per unit flux, average travel time per vehicle and the relationship between the emissions per unit flux and the ratio of dynamic vehicles by using six route guidance strategies were obtained. Results showed that mean velocity route guidance strategy (MVS) and congestion coefficient route guidance strategy (CCS) were the best ones. They can effectively reduce the traffic emissions and improve the efficiency of traffic network. In terms of the total emissions, the value of emissions on the symmetrical two-route scenario with two

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