Implementation of the Traffic Control Strategy TUC on the Chania Traffic Network

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English Abstract

Despite the long-lasting research and development worldwide, co-ordinated urban traffic control is still an area susceptible to further significant improvements. A number of more or less sophisticated real-time (traffic-responsive) urban control strategies have been developed and implemented in the past, such as SCOOT, SCATS, UTOPIA, TASS, CLAIRE, MOTION, OPAC, PRODYN, COP, CRONOS, BALANCE, leading, in most cases, to improvements in the order of 10% of average journey time as compared to fixed-time (time-of-day) optimised settings. The main disadvantages of these signal control strategies are that they are functionally decentralized and that they perform poorly under saturated traffic conditions, unless a very time- and effort-consuming fine-tuning process is employed. In contrast, the signal control strategy TUC is genuinely network-wide and has been conceived to address traffic saturation in a highly efficient and elegant way. TUC is, at the same time, simpler than any other strategy and may be easily applied to any network via implementation of a generic software code, whereby the specifics of each application are incorporated in suitable input files to feed the software code. Moreover, TUC has very low communication requirements between the junctions and the control center (one data packet exchange per cycle), and requires a minimum amount of fine-tuning.

As part of the European Information Technologies Programme project SMARTNETS, TUC is in the final implementation phase for the whole traffic network of the city of Chania (total of 16 junctions) as well as in parts of the traffic networks of the cities of Southampton, U.K., and Munich, Germany. In the present article, we present the results of the implementation of TUC in the traffic network of Chania. More specifically, comparison results between the existing traffic control strategy (TASS) and TUC are presented, evaluated and analyzed.

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