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Travel Time Forecasting and Dynamic OD Estimation in Freeways Based on Bluetooth Traffic Monitoring.

ABSTRACT

From the point of view of the information supplied by an ATIS to the motorists entering a freeway of one of the most relevant is the Forecasted Travel Time, that is the expected travel time that they will experience when traverse a freeway segment. From the point of view of ATMS the dynamic estimates of time dependencies in OD matrices is a major input to dynamic traffic models used for estimating the current traffic state and forecasting its short term evolution. Travel Time Forecasting and Dynamic OD Estimation are two of the key components of ATIS/ATMS and the quality of the results that they could provide depend not only on the quality of the models but also on the accuracy and reliability of the measurements of traffic variables supplied by the detection technology. The quality and reliability of the measurements produced by traditional technologies, as inductive loop detectors, is not usually the required by real-time applications, therefore one wonders what could be expected from the new ICT technologies as for example Automatic Vehicle Location, License Plate Recognition, detection of mobile devices and so on. The main objectives of this paper are: to explore the quality of the data produced by the Bluetooth detection of mobile devices equipping vehicles for Travel Time Forecasting and its use to estimate time dependent OD matrices. Ad hoc procedures based on Kalman Filtering have been designed and implemented successfully and the numerical results of the computational experiments are presented and discussed.