
Theoretical criteria for correctness of microscopic traffic models

Milan Krbálek

Department of Mathematics, Faculty of Nuclear Sciences and Physical Engineering,
Czech Technical University, Trojanova 13, Prague 120 00, EU - Czech Republic

Email: milan.krbalek@fjfi.cvut.cz

URL: <http://www.krbalek.cz/>

Abstract

We will present some interesting mathematical and statistical predictions on certain universal properties of general agent-systems with an accent to the microstructure of vehicular flows. We will show that some of the statistical distributions, which are usually applied for fitting the time- or distance- headway histograms, are (for such a purpose) mathematically (and statistically) inadmissible. Simultaneously, we will formulate basic rules for permissibility of analytical headway-distributions, as well as rules for an appraisal of microscopical predictions of traffic models. All the theoretical criteria will be confronted to the advanced statistical analysis of freeway data and discussed within the context of the traffic theory. Marginally, the connection between traffic microstructure and Random Matrix Theory will be commented.

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