

MULTI-CLASS AND MULTI-POPULATION TRAFFIC FLOW MODELS ON NETWORKS

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ABSTRACT. We present a general framework for the modeling and simulation of multi-class (i.e. different vehicle types [2]) and multi-population (i.e. different routes [1, 3, 4]) traffic flow on road networks. The models consist of system of conservation laws coupled in the speed component of the flux function, allowing for overtaking and creeping of different vehicle types. Suitable, class specific, coupling conditions at junctions allow to design Godunov type numerical schemes exploiting the supply-demand formulation. The simulation can then be coupled to routing strategies at road junctions to represent the choices of the different populations of drivers. Some numerical tests are presented to illustrate the model behaviours.

Keywords: Macroscopic traffic flow models; Hyperbolic systems of conservation laws; Finite volume schemes

Mathematics Subject Classifications (2010): 35L65, 65M08, 90B20,

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