Title:	Dynamic Continuum Model for Traffic Assignment in an Urban City
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Abstract:	Mathematical models established on partial differential equations (PDEs) are omnipresent these days, emerging in all fields of science and engineering. Example implementation areas include fluid dynamics, quantum theory, general and special relativity, nonlinear dynamics, biology, cellular automata, cardiac modeling, finance and option pricing. Unfortunately, it is almost always impossible to acquire closedform solutions of PDE equations, even in very simple cases. Therefore, numerical schemes for finding approximate solutions to PDE problems are of great importance. For the opulence in both developed and developing countries, efficient traffic systems are indispensable. However, due to an overall increase of mobility and transportation during the last two decades, the capacity of the road infrastructure has been reached. Many mega cities already suffer from daily traffic collapses and their environmental consequences. More fuel consumption and air pollution is caused by impeded traffic and stop-and-go traffic. Due to such reasons, several models for freeway traffic have been proposed. Such models are used for developing traffic optimization measures like on-ramp control, variable speed limits or re-routing systems. The continuum modeling approach to transportation models is now gaining much attention because of its advantages in dealing with macroscopic problems, initial phase planning and dense-network models. In this text we provide a comprehensive review of the of the development and application of the predictive continuum dynamic useroptimal (PDUO-C) modeling approach. We first discuss the theoretical development and then discuss some results of PDUO-C in regard of the density profiles and the cost-potential. Such profiles are useful in study of facility location, route choice, pedestrian ow, and policy and socio-economical analysis. We examine the numerical solution to the system of partial differential equations for the conservation law governing the density, in which the ow direction is determined, and a Hamilton-Jacobi equation to compute the total travel cost using the Lax-Friedrichs scheme. The intertwined system of equations is solved by self-adaptive method of successive averages (MSA) using the least square fitting. Numerical results are demonstrated through computer simulation in MATLAB.