

Monitoring and performance measures of congestion for urban traffic systems

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Friday, 18 March 2011 - 16:00

Location: TBD

Abstract

The introduction of Intelligent Transportation Systems (ITS) technologies and new sensing hardware promise significant progress in reducing the congestion level in cities. With respect to monitoring, reliable and efficient estimation of travel times and other performance measures is still not a wide spread accomplishment on arterials since it requires extensive sensor infrastructure normally found only on freeways. The issue is not only that the existing monitoring infrastructure in arterials is less dense than freeways but also that arterial systems traffic dynamics are significantly different than these of freeways and fixed sensors cannot always give the required level of information. In this talk, we present our recent findings in travel time estimation in arterial systems. Our models are based on data commonly provided by loop detectors system and/or GPS data and the signal settings at each traffic signal. The models consider the spatial and temporal queuing at the traffic signals and the signal coordination in arterial to estimate travel times distributions. The model extensions explicitly address the issues of long queues and spillovers that frequently occur on arterials in urban areas and interdependencies between consequent links. The validation of the monitoring methodologies is conducted at different scales of complex city-level scenarios using advanced micro-simulation software and data from field experiments.

Biography

Nikolas Geroliminis is an Assistant Professor at EPFL and the head of the Urban Transport Systems Laboratory (LUTS). He has a diploma in Civil Engineering from the National Technical University of Athens (NTUA) and a MSc and Ph.D. in civil engineering from University of California, Berkeley. Before joining EPFL he was an Assistant Professor on the faculty of the Department of Civil Engineering at the University of Minnesota. He is a member of the Transportation Research Board's Traffic Flow Theory Committee. He also serves in the editorial board of Transportation Research, part B and Transportation Letters. His research interests focus primarily on urban transportation systems, traffic flow theory and control, public transportation and logistics.