

***Technical University of Crete  
Dynamic Systems and Simulation Laboratory  
Presentation of Activities***

**Prof. Markos Papageorgiou and Assistant Prof. Ioannis Papamichail**



**Technical University of Crete - TUC  
Dynamic Systems and Simulation Laboratory - DSSL**

**AComIn Kick-off Meeting  
Sofia, Bulgaria, October 26, 2012**

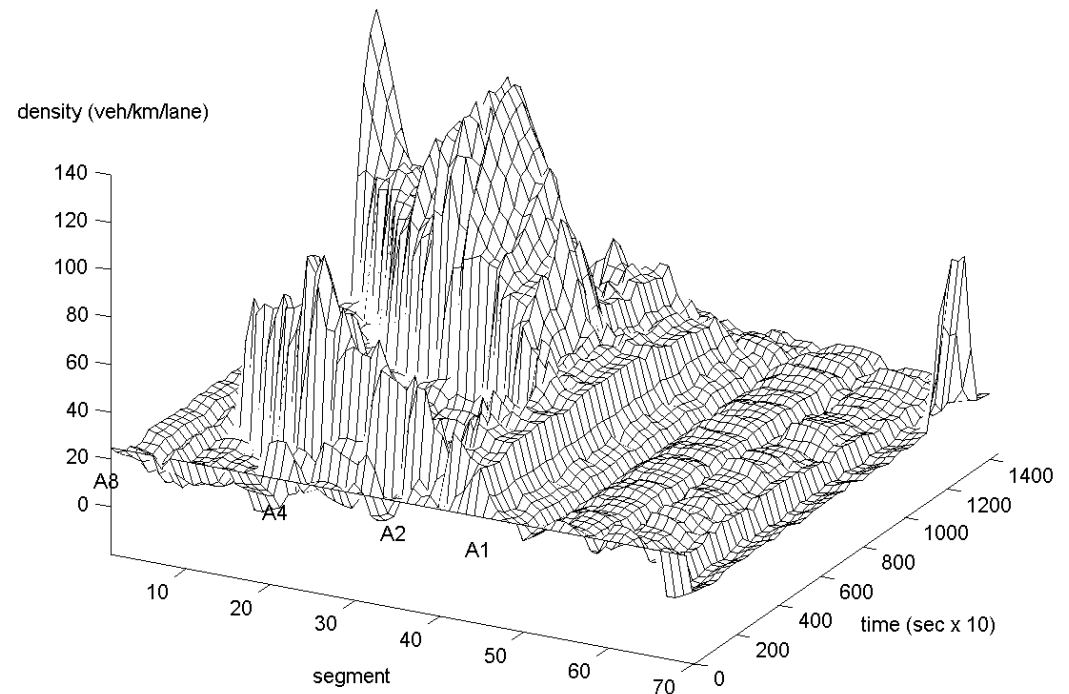
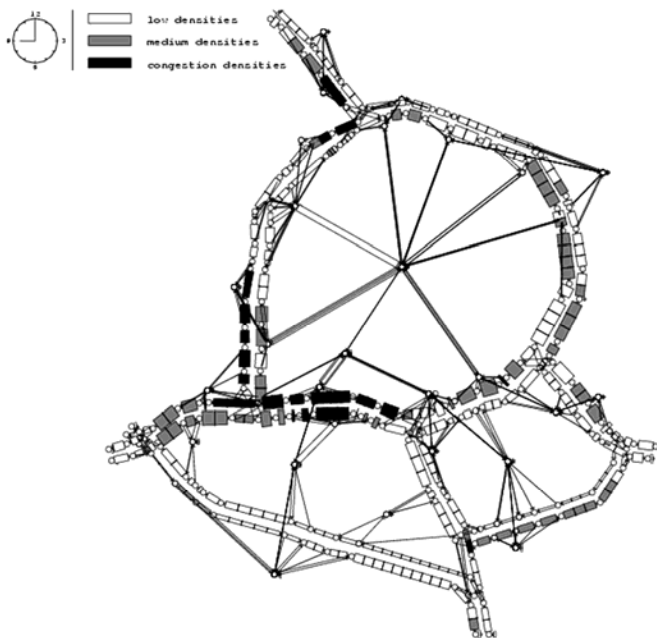
# Personnel

- Faculty members
  - Prof. Markos Papageorgiou (Director)
  - Assistant Prof. Ioannis Papamichail
- Post-doc Research Associates
  - Dr. Diamantis Manolis
- PhD Students
  - Mehdi Keyvan Ekbatani
  - Georgia-Roubini Iordanidou
  - Antonios Lentzakis
  - Anastasia Spiliopoulou
- MSc Students
  - Christos Katrinakis
  - Maria Kontorinaki
  - Garifalia Malandraki



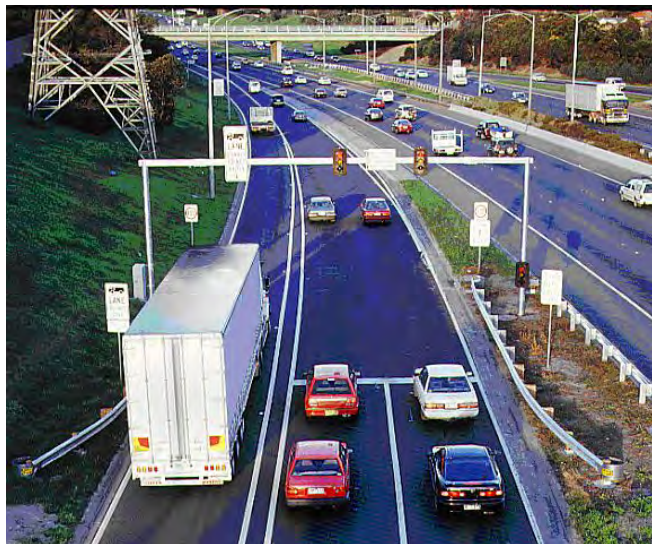
# Research Activities

- Traffic Flow Modeling and Control
  - Development and validation of macroscopic modeling and simulation tools for urban, motorway and mixed networks (METANET, METANET-DTA, METACOR)



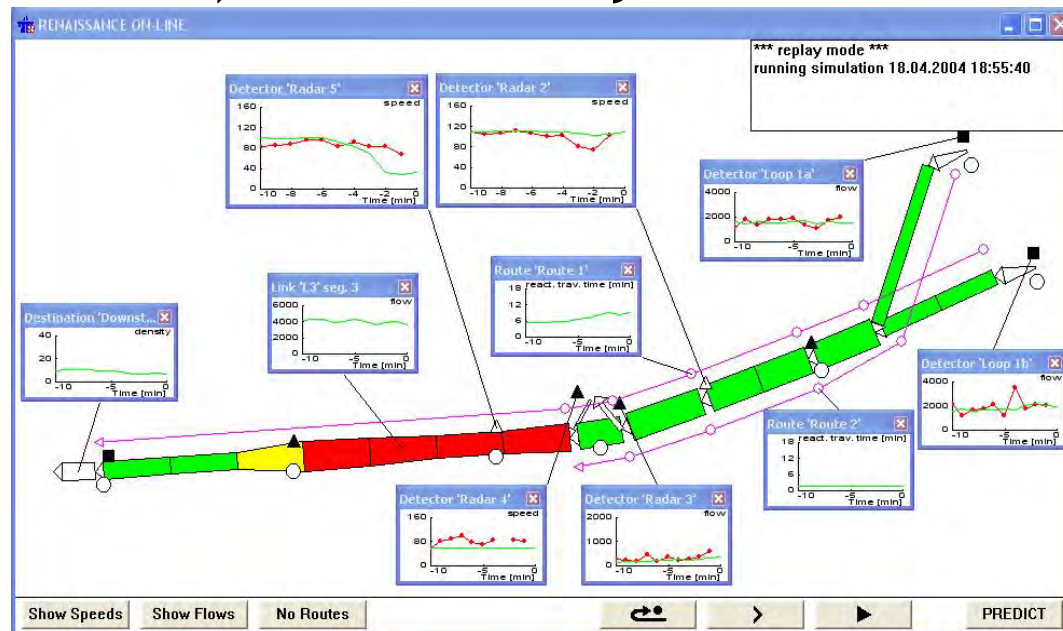
# Research Activities

- Traffic Flow Modeling and Control
  - Control strategies for ramp metering (ALINEA, METALINE, HERO), urban traffic signal control (CRONOS, TUC), Variable Message Signs (AUTCON), route guidance (AMOR), variable speed limits, and mainstream traffic flow control on motorways



# Research Activities

- Traffic Flow Modeling and Control
  - Integrated traffic control strategies for motorway and mixed highway networks (IN-TUC, AMOC)
  - Surveillance, estimation and prediction algorithms (RENAISSANCE) for motorway networks





# Research Activities

- Traffic Flow Modeling and Control
  - Field installations of traffic monitoring and control algorithms in Paris (FR), Dutch Motorway Network (NL), Glasgow (UK), Scottish Highway Network (UK), Aalborg (DK), Chania (GR), Southampton (UK), Munich (DE), Bavarian motorways (DE), Napoli (IT), Tel Aviv (IL), Victoria and Queensland (AT), Macae and Maoua (BR), Antwerp (BE), Athens (GR)



# Research Activities

- Modeling and Control of Water Systems
  - Development of generic modeling and control tools
  - Development and installation of an advanced optimal control strategy for the sewer network of Obere Iller (DE)
  - Development of integrated control strategies for combined sewer networks and treatment plants



# Research Activities

- Theory, Methods, and Algorithms
  - Numerical Algorithms of Optimal Control
  - Game Theoretic Operations Research Models
  - Dynamic Control of Reliability Systems and Queuing Networks
  - Graph Coloring: Heuristics and Applications
  - Forecasting Algorithms Using Time-Series Methods and Neural Networks
  - Optimum-Tracking Stochastic Feedback Control Laws
  - Adaptive Control Algorithms for Unknown Nonlinear Systems
  - Global Optimization of Dynamic Systems





# Research Contracts

- Funding mainly from the European Commission; but also from the Greek Secretariat of Research & Technology; the Greek National Education Ministry; and many R&D contracts by companies or authorities; the accumulated funding amount reaching some 6 M€.
- **NEARCTIS** (Network of excellence for advanced road cooperative traffic management in the information society): funded by EC (DG INFSO), R&D Programme ICT
- **AGILE** (Development and applications of advanced adaptive automatic control methods): funded by EC (DG INFSO), R&D Programme Networked Embedded and Control Systems
- COST Action **MULTITUDE** (Methods and tools for supporting the use, calibration and validation of traffic simulation models)
- COST Action **ARTS** (Towards autonomic road transport support systems)
- 4 National projects and 1 R&D contract by the Main Roads Western Australia, Perth, Australia



# Other Activities (1994-2012)

- 2 books
- 98 journal articles
- 24 book chapters
- 185 conference papers
- 350 scientific presentations (conferences, workshops, seminars, etc.) from which:
  - 48 invited plenary talks
  - 98 invited talks at universities, research centers, authorities
- Prof. Papageorgiou is the Editor-in-Chief *Transportation Research C*
- 139 participations in International Program Committees for Conferences
- Short Course “Dynamic Traffic Flow Modelling and Control” (10 editions - 193 international participants)
- 27 invited external examinations for PhD Dissertations



# Awards and Distinctions

- Prof. M. Papageorgiou is an IEEE Fellow (1999).
- Prof. M. Papageorgiou received the **2007 IEEE Outstanding ITS Research Award** from the IEEE Intelligent Transportation Systems Society.
- Prof. M. Papageorgiou was proclaimed **Visiting Professor** of the Faculty of Transport and Traffic Engineering of the University of Belgrade, Serbia, *in profound appreciation for many years of significant leadership and outstanding scientific contributions* (2010).
- Dr. R.C. Carlson received the **Gold Medal at the YEAR 2010** (Young European Arena of Research) competition.
- Prof. M. Papageorgiou and Assistant Prof. I. Papamichail received the **2010 Transition to Practice Award** by the IEEE Control Systems Society for *the development and implementation of ramp metering algorithms, in particular at the Monash Freeway, Melbourne, Australia.*



# Awards and Distinctions

- DSSL received the **2011 IEEE ITS Institutional Lead Award** by the IEEE Intelligent Transportation Systems Society for *outstanding contributions and successful implementations in traffic flow modelling and control*.
- M. Keyvan-Ekbatani, Dr. A. Kouvelas, Prof. I. Papamichail and Prof. M. Papageorgiou received the **Best Paper Award** at the Transportation Research Arena (TRA 2012) in Pillar II: Transport, Mobility and Infrastructure.
- Dr. A. Kouvelas received the **2012 IEEE ITSS Best Ph.D. Dissertation Award** (second place prize) from the IEEE Intelligent Transportation Systems Society.

