

2015

Transportation Abstracts

Annual International Conference
on Transportation
8-11 June 2015, Athens, Greece

Edited by Gregory T. Papanikos

THE ATHENS INSTITUTE FOR EDUCATION AND RESEARCH



Transportation Abstracts
Annual International
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Greece

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Preface

This abstract book includes all the abstracts of the papers presented at the *Annual International Conference on Transportation, 8-11 June 2015*, organized by the Athens Institute for Education and Research. In total there were 26 papers and 27 presenters, coming from 15 different countries (Australia, Bulgaria, Canada, Croatia, Hong Kong, India, Israel, Japan, Poland, Romania, Russia, Saudi Arabia, Spain, Turkey and USA). The conference was organized into nine sessions that included areas of Traffic Safety, Railway Support Systems, Transportation Operations and Management, Urban Transportation, Freight and Logistics and other related disciplines. As it is the publication policy of the Institute, the papers presented in this conference will be considered for publication in one of the books and/or journals of ATINER.

The Institute was established in 1995 as an independent academic organization with the mission to become a forum where academics and researchers from all over the world could meet in Athens and exchange ideas on their research and consider the future developments of their fields of study. Our mission is to make ATHENS a place where academics and researchers from all over the world meet to discuss the developments of their discipline and present their work. To serve this purpose, conferences are organized along the lines of well established and well defined scientific disciplines. In addition, interdisciplinary conferences are also organized because they serve the mission statement of the Institute. Since 1995, ATINER has organized more than 150 international conferences and has published over 100 books. Academically, the Institute is organized into four research divisions and nineteen research units. Each research unit organizes at least one annual conference and undertakes various small and large research projects.

I would like to thank all the participants, the members of the organizing and academic committee and most importantly the administration staff of ATINER for putting this conference together.

Gregory T. Papanikos
President

FINAL CONFERENCE PROGRAM
Annual International Conference on Transportation, 8-11 June 2015,
Athens, Greece

PROGRAM

Conference Venue: Titania Hotel, 52 Panepistimiou Avenue, Athens, Greece

Organization and Scientific Committee

1. Dr. Gregory T. Papanikos, President, ATINER & Honorary Professor, University of Stirling, UK.
2. Dr. George Poulos, Vice-President of Research, ATINER & Emeritus Professor, University of South Africa, South Africa.
3. Dr. Nicholas Pappas, Vice-President of Academics, ATINER, Greece & Professor, Sam Houston University, USA.
4. Dr. Panagiotis Petratos, Vice President of ICT, ATINER, Fellow, Institution of Engineering and Technology & Professor, Department of Computer Information Systems, California State University, Stanislaus, USA.
5. Dr. Chris Sakellariou, Vice President of Financial Affairs, ATINER, Greece & Associate Professor, Nanyang Technological University, Singapore.
6. Dr. Nicholas Patricios, Director, Engineering & Architecture Research Division, ATINER, Professor & Dean Emeritus, School of Architecture, University of Miami, USA.
7. Dr. Virginia Sisiopiku, Academic Member, ATINER, & Associate Professor, The University of Alabama at Birmingham, USA.
8. Ms. Olga Gkounta, Researcher, ATINER.

Administration

Stavroula Kyritsi, Konstantinos Manolidis, Katerina Maraki & Kostas Spiropoulos

Monday 8 June 2015

(all sessions include 10 minutes break)

08:30-09:00 Registration and Refreshments

09:00-09:30 (ROOM A-10TH FLOOR) Welcome & Opening Remarks

- Dr. Gregory T. Papanikos, President, ATINER & Honorary Professor, University of Stirling, UK.
- Dr. Nicholas Patricios, Director, Engineering & Architecture Research Division, ATINER, Professor & Dean Emeritus, School of Architecture, University of Miami, USA.
- Dr. Virginia Sisiopiku, Academic Member, ATINER, & Associate Professor, The University of Alabama at Birmingham, USA.

09:30-11:00 Session I (ROOM B-10TH FLOOR): Traffic Safety

Chair: Virginia Sisiopiku, Academic Member, ATINER, & Associate Professor, The University of Alabama at Birmingham, USA.

1. Essam Radwan, CATSS Director, University of Central Florida, USA & Hatem Abou-Senna, University of Central Florida, USA. Modelling of Pedestrian Crash Rates and Prediction Functions.
2. *Todd Litman, Executive Director, Victoria Transport Policy Institute, Canada. A New Traffic Safety Agenda: Incorporating Transportation Demand Management Safety Strategies.
3. Rachel Shichrur, Ph.D. Student, Tel Aviv University, Israel & *Navah Z. Ratzon, Professor, Tel Aviv University, Israel. Convergent Validity of In-Vehicle Data Recorder (IVDR).

11:00-12:30 Session II (ROOM B-10TH FLOOR): Railway Support Systems

Chair: Essam Radwan, CATSS Director, University of Central Florida, USA

1. Alexandru Bitoleanu, Professor, University of Craiova, Romania, Mihaela Popescu, Professor, University of Craiova, Romania & Mircea Dobriceanu, Professor, University of Craiova, Romania. Possibilities of Using the Traction Transformer in Active DC Traction Substation.
2. Mihaela Popescu, Professor, University of Craiova, Romania, Alexandra Preda, Assistant, University of Craiova, Romania & Vlad Suru, Lecturer, University of Craiova, Romania. Synchronous Reference Frame Method Applied in the Indirect Current Control for Active DC Traction Substation.
3. Constantin Vlad Suru, Lecturer, University of Craiova, Romania, Alexandru Bitoleanu, Professor, University of Craiova, Romania & Mihaita Linca, Lecturer, University of Craiova, Romania. Indirect Current Control of a Filtering and Regeneration System used in DC Substations for Urban Traction.
4. Mihaita Linca, Lecturer, University of Craiova, Romania, Cristina Alexandra Preda, Assistant, University of Craiova, Romania & Mihaela Popescu, Professor, University of Craiova, Romania. Conservative Power Theory (CPT) Method Applied in the Indirect Current Control for Active D.C. Traction Substations.

12:30-14:00 Session III (ROOM B-10TH FLOOR): Transportation Operations and Management

Chair: *Todd Litman, Executive Director, Victoria Transport Policy Institute, Canada

1. *Jun-ichiro Giorgos Tsutsumi, Professor, University of the Ryukyus, Japan, Ryo Nakamatsu, Assistant Professor, University of the Ryukyus, Japan, Mayumi Touyama, Researcher, Urban Science Associates, Japan, Mohammad Asaduzzaman, Graduate student, University of the Ryukyus, Japan, Masaru Matsuda, Graduate student, University of the Ryukyus, Japan & Adrianus Bannepadang, Graduate student, University of the Ryukyus, Japan. From Present Car Dependency to Future Public Transportation in an Island Region, Okinawa.
2. Ivan Beloey, Ph.D. Student, University of Ruse, Bulgaria & Velizara Pencheva, Professor, University of Ruse, Bulgaria. Current Issues for the Development of Transport Infrastructure of the Republic Bulgaria.
3. *Marek Bauer, Assistant Professor, Cracow University of Technology, Poland. The Curb-Parking Influence on the Efficiency of Designated Bus Lane.

14:00-15:00 Lunch

15:00-16:00 Session IV (ROOM B-10TH FLOOR): Infrastructure

Chair: *Marek Bauer, Assistant Professor, Cracow University of Technology, Poland

1. Slawomir Karas, Head of Road and Bridge Chair at Civil Engineering and Architecture Faculty, Lublin University of Technology, Poland & Maciej Kowal, Bridge Researcher in Road and Bridge Chair, Lublin University of Technology, Poland. Bridge as an Environmental Check-Point.
2. Janusz Gajda, Professor, AGH - University of Science and Technology, Poland & Justyna Michniak, Ph.D. Student, AGH - University of Science and Technology, Poland. Administrative Weigh-In-Motion Systems in Poland.

16:00-17:00 Session V (ROOM B-10TH FLOOR): Cross Cutting Efficiency

Chair: Slawomir Karas, Head of Road and Bridge Chair at Civil Engineering and Architecture Faculty, Lublin University of Technology, Poland.

1. *Bojan Hlaca, Professor, Polytechnic of Rijeka, Croatia & Dusan Rudic, Polytechnic of Rijeka, Croatia. Global Transport System Efficiency.
2. Cristina Gonzalez Rechea, Researcher, Universidad Politecnica de Madrid, Spain, Rosa Maria Arnaldo Valdes, Professor, Universidad Politecnica de Madrid, Spain & Victor Fernando Gomez Comendador, Professor, Universidad Politecnica de Madrid, Spain. Designing and developing new VET Curricula to Address Skills Gaps in the Aeronautics Industry.

21:00-23:00 Greek Night and Dinner (Details during registration)

Tuesday 9 June 2015

08:00-09:30 Session VI (ROOM B-10TH FLOOR): Planning and Modelling

Chair: *Bojan Hlaca, Professor, Polytechnic of Rijeka, Croatia.

1. *Vladimir Mazalov, Professor, Saint-Petersburg State University, Russia & Anna Melnik, Saint-Petersburg State University, Russia. Wardrop Equilibrium for a Network with the BPR Latency Function.
2. Ivona Bajor, Senior Assistant, University of Zagreb, Croatia, Goran Kolaric, Ministry of Science, Education and Sports, Croatia & Dario Babic, Ph.D. Student, University of Zagreb, Croatia. Greening the Supply Chain by Reverse Logistics Process Modelling.
3. Angel Marrero, Ph.D. Student, Universidad de La Laguna, Spain, Rosa Marina Gonzalez, Universidad de La Laguna, Spain & Elisabetta Cherchi, University of Denmark, Denmark. Measuring the Inertia Effect on Mode Choice: A Panel Data around a New Tram Implementation.
4. Sonia Arora, Urban Transport Expert, Institute of Urban Transport, India. Improving Urban Mobility in Small and Medium Towns in India.

09:30-11:00 Session VII (ROOM B-10TH FLOOR): Urban Transportation*

Chair: *Remah Gharib, Assistant Professor, Hamad Bin Khalifa University, Qatar.

1. Charlie Qiuli Xue, Associate Professor, City University of Hong Kong, Hong Kong. Rail Village and Mega-Structure - A Case Study of Hong Kong.
2. *Deborah Middleton, Assistant Professor, Prince Mohammad Bin Fahd University, Saudi Arabia. The Pedestrian Esplanade: An Inquiry into the Generative Urban Design Process of C. A. Doxiadis.
3. *Nikiforos Stamatiadis, Professor, University of Kentucky, USA, Adam Hedges, Graduate Researcher, University of Kentucky, USA & Adam Kirk, Research Engineer, University of Kentucky, USA. Updated Guidelines for Left-Turn Phase Selection.

**Jointly organized with the 5th Annual International Conference on Urban Studies & Planning*

11:00-12:30 Session VIII (ROOM B-10TH FLOOR): Enabling Technologies

Chair: *Nikiforos Stamatiadis, Professor, University of Kentucky, USA.

1. Hongmian Gong, Professor, Hunter College of City University of New York, USA. Combining Web GIS, Smartphone, Social Media and Cloud Computing for Sustainable and Healthy Mobility.
2. *Qian Sun, Ph.D. Candidate, Curtin University, Australia, Jianhong (Cecilia) Xia, Curtin University, Australia, Jonathan Foster, Curtin University, Australia, Hoe Lee, Curtin University, Australia & Torbjorn Falkmer, Curtin University, Australia. Validating the Capability of GPS/GNSS Tracking Driving Behaviours in Various Scenarios.
3. Muhammad Awais Shafique, Ph.D. Candidate, The University of Tokyo, Japan & Eiji Hato, Professor, The University of Tokyo, Japan. Optimum Training Sample Size for Travel Mode Detection using Smartphone.

12:30-13:30 Lunch

13:30-15:00 Session IX (ROOM B-10TH FLOOR): Freight and Logistics

Chair: *Vladimir Mazalov, Professor, Saint-Petersburg State University, Russia.

1. Halim Yurdakul, Assistant Professor, Okan University, Turkey & Avni Zafer Acar, Head, Okan University, Turkey. Evaluating the Contribution of Transportation and Logistics Industry to Turkey's Competitive Power.
2. Dzhemal Topchu, Ph.D. Student, University of Ruse, Bulgaria, Velizara Pencheva, Professor, University of Ruse, Bulgaria, Asen Asenov, Associate Professor, University of Ruse, Bulgaria & Denitsa Miteva, Ph.D. Student, University of Ruse, Bulgaria. Contemporary State of Load Shipments in Small Batches in the Cities of Republic of Bulgaria.

16:30-19:00 Urban Walk (Details during registration)

20:30- 22:00 Dinner (Details during registration)

Wednesday 10 June 2015

Cruise: (Details during registration)

Thursday 11 June 2015

Delphi Visit: (Details during registration)

Sonia Arora

Urban Transport Expert, Institute of Urban Transport, India

Improving Urban Mobility in Small and Medium Towns in India

India had an urban population of 377 million as per Census 2011, almost 42% of which lived in 53 million plus cities. The remaining 58% of India's urban population lived in urban centres with population greater than 0.1 million and less than 1 million, often referred to as 'small and medium towns'. During the past decade, these small and medium towns recorded a generally higher rate of growth than the million plus cities. Along with increasing population, there is growing evidence about the increasing contribution of small cities to India's urban economy. Growing population and economic activity of small and medium towns point towards a higher degree of role that they may be expected to play in India's rise as a global economic powerhouse. However, these cities remain a major caveat to this notion. With increasing rate of population and economic growth in small and medium towns, the travel demand is bound to increase.

The aim of the study is to undertake an assessment of urban transport in small and medium sized population cities. A sample of 14 cities has been taken up across the country to collect transport data and draw basic indicators to deduce issues concerning mobility in the towns.

The important urban transport issues identified are that the cost of living compared to the metropolitan areas is lesser, and arguably higher carrying capacity, find themselves at the forefront of the phenomenon. Availability of cheap private transport in the form of 2-wheelers and ease of mortgage facilities for owning them is leading the exponential rise in traffic. The transport network, mainly comprising a road network built during the colonial era, is increasingly becoming insufficient and redundant to support the ensuing traffic due to the travel demand leading to heavy traffic congestion. At the same time, failure to provide a systematic and appropriate public transport system has resulted in the growth of informal sector (in the form of cycle rickshaws, auto rickshaws and taxis, referred to as IPT - intermediate public transport) that is bridging the supply-demand gap for commuters. Lack of sufficient regulations on the IPT system is leading to a proliferation of the vehicles further aggravating the congestion. Growth in 2-wheelers coupled with inadequately enforced road safety regulations along with unsafe driving practices by IPT operators are

causing problems of road safety. Air quality continues to decline with increasing traffic congestion.

The key interventions that can alleviate current and future mobility issues to a significant extent are relieving traffic congestion, creating a safer environment for travel, enabling integrated planning of transport and land use and introducing traffic management schemes which can be done in short, medium and long term. Also help these towns to undertake a systematic approach towards their planning at this early stage of their development so as to establish sustainable forms of land use and mobility systems around which they may grow and economically thrive in the future.

Ivona Bajor

Senior Assistant, University of Zagreb, Croatia

Goran Kolaric

Ministry of Science, Education and Sports, Croatia

&

Dario Babic

Ph.D. Student, University of Zagreb, Croatia

Greening the Supply Chain by Reverse Logistics Process Modelling

Continuous scientific research regarding reverse logistics in developing logistics systems affirm generation of certain logistics costs and direct influence on environment from different aspects. Developed logistics systems are analyzing returns and are tending to detect differences and oscillations in return flows, while developing logistics systems, as Croatian, reverse logistics issues are not observing as issues of priority.

Planning and implementing a suitable, individually modeled reverse logistics processes could reduce costs, green the flows, upgrade customer satisfaction, and a social picture for companies.

Paper will detect existing processes of logistics company providing outsourced reverse logistics activities for a multichannel retailer on the Croatian market. Processes will be observed from the aspect of defined transport processes, warehouse handling and directing of returned products. Defined "as-is" state will be foundation for process modeling of sustainable and suitable activities for the benefit of outsourced company and a multichannel retailer.

Outcome is settled as a proposition for developing logistics systems to observe reverse logistics issues from the higher, supply chain aspect, where this part of the chain can be optimized by creative and individually modeled solutions.

Marek Bauer

Assistant Professor, Cracow University of Technology, Poland

The Curb-Parking Influence on the Efficiency of Designated Bus Lane

Engineering means to improve the quality of urban transport – as designated bus lanes – are increasingly being used in Polish cities. Their efficiency is very differentiated, because of the influence of many disturbing factors and the lack of determination and consequence in privileging buses. Sometimes it happens, that even other positive measures of improve the quality of the transport system are in conflict with designated bus lanes. Such a situation may be the case for the introduction of paid parking zone along the transportation corridor with the bus lane. This paper discusses the influence of the curb parking onto speeds of buses on designated bus lanes. Parking on the sidewalk located right next to the bus lane is often ignored in public transportation analyses in Polish cities. It often happens – for this reason – that in the planning process, there are accepted too optimistic values of buses' speeds, very difficult to achieve after implementation of the planned solutions.

The main tool in this discussion is own, author's probabilistic model of conflict between running buses and parking cars. This model states the part of comprehensive bus lane studies in Polish cities, leading to develop a scientific method of traffic organization within the right curb bus lanes. Model bases onto real measurement results of bus running times and parking facilities. There are presented the results of duration of parallel parking manoeuvres with designated bus lane space using and the time of occupying the potential conflict area on the separated lane, by buses and cars. In this analysis, inter alia – bus driver's decision time and the time required for safe bus stopping are considered.

Presented model can be used in simulation of the effects of curb-parking onto bus speeds, in relation to different frequencies of parking manoeuvres.

Ivan Beloev

Ph.D. Student, University of Ruse, Bulgaria
&

Velizara Pencheva

Professor, University of Ruse, Bulgaria

Current Issues for the Development of Transport Infrastructure of the Republic Bulgaria

This paper provides a review of the condition of the transport infrastructure of the Republic of Bulgaria for all types of transport and possible criteria for its evaluation. According to specific criteria assurance territory with transport infrastructure is estimated.

Alexandru Bitoleanu

Professor, University of Craiova, Romania

Mihaela Popescu

Professor, University of Craiova, Romania

&

Mircea Dobriceanu

Professor, University of Craiova, Romania

Possibilities of Using the Traction Transformer in Active DC Traction Substation

In the DC traction systems, the traction substations are fed by the high voltage three-phase network and usually contain a specific traction transformer and an uncontrolled rectifier. In order to reduce the harmonic distortion of the supply current, a structure of twelve-pulse rectifier is often adopted, consisting of two diode bridges connected in series or in parallel and supplied from two secondary windings of the transformer, one in star connection and the other in delta connection. The common rated DC voltages provided by the rectifier are: 750 V (most trams and metro rail); 1500 V (regional express trains and Intercity) and 3 kV. For low and medium dc voltages (750V and 1500V), the most used rectifier schemes are three phase bridge (6 pulses) and two three phase bridges connected in parallel (12 pulses) because it is appreciate that the efficiency is higher. If the dc voltage is 3000V, using the series 12 pulses rectifiers can be more advantageous, especially from reliability point of view, because the voltage class of the rectifiers is halved.

Although 12 pulse rectifiers have current distortion factor lower (about 15%), because of high power, DC traction substations are important harmonic polluters. Consequently, and other equipment must be used to reduce harmonic distortion and the degree of compliance with the limits set.

Another way to increase the energy efficiency of traction substations and reduce the energy consumption is recovery of braking kinetic energy. The electric traction motors are able to transform the kinetic energy into electrical energy, but, only a small amount of the resulted energy is usually reused for the auxiliary services. The remaining energy can be sent back to the grid only if other train, which accelerates, is close to the same line section and takes advantages of this energy conveyance. If there is no other train nearby to absorb this energy, the grid voltage increases and this supplementary energy must be scattered in braking resistances. The methods identified so far for braking energy recovery involve either the use of various mobile/stationary energy storage devices or the direct return to the AC-power utility. The most

advantageous solution is to recover the surplus energy in the traction substations and to compensate the current harmonics and reactive power by materializing the “active station” concept. The traction substations have not the capacity to absorb the energy generated during the braking phases of trains because they provide the current only in one direction. A reversible station has the capacity to allow the active power flow in the both ways. But, the connection to the same transformer, at the medium voltage side, can affect the capability of achieving the function of regeneration in terms of current distortion because the performances of the system depends on the difference between the two voltages. Compared to the reversible stations, the new system called “active substation” allows not only the energy recovery, but also complementary functions, such as the grid harmonics compensation by operating like an APF and the active compensation of the reactive power.

The proposed system in this paper is intended to ensure both the total compensation of the DC traction substation load and the braking energy recovery by sending it back to the power supply using the traction transformer of the DC traction substations with 12 pulses rectifier (two 6-pulse bridges connected in series). In this way, the existing DC traction substations with uncontrolled 12 pulses rectifier become “active substations”. The paper is organized in the following sections: Introduction; The correlation between the dc voltage and ac voltage; Filtration and regeneration system structure; The Simulink model of the system; Performances by simulation in filtration and regeneration mode; Conclusions.

After demonstrating that the DC traction substations with 12 pulses rectifier allow direct coupling SISFREG in traction transformer secondary, Section 3 is devoted to presenting the system structure. Next, the Simulink model of the entire system (SISFREG and vehicle - DC line assembly) is presented. Then, the performances for the filtering mode, as well as, for the recovery mode are determined when the system operates in open loop mode. Finally, some concluding remarks related to the system performance are drawn.

Janusz Gajda

Professor, AGH - University of Science and Technology, Poland
&

Justyna Michniak

Ph.D. Student, AGH - University of Science and Technology, Poland

Administrative Weigh-In-Motion Systems in Poland

The paper describes the legislative and technical problems corresponding to implementation of the Weigh-In-Motion systems for the direct enforcement of the allowable vehicle weights and axle loads. Such kind of WIM systems are called by authors the “administrative” WIM systems. They are to operate in the similar way as so called photo-radars but in terms of compliance by-vehicle owners with regulations defining allowable vehicle weights and loads of the individual axles and groups of axles. Conditions of practical implementation of this idea are following:

1. create a detailed procedures for legalization and metrological control of WIM systems,
2. to develop technical requirements for administrative WIM systems.

Fulfilling both conditions is not an easy task. The creation of the legalization procedures arises from specific properties of the WIM sites. To the most important belong the following:

- load sensors are installed in the pavement and the section of pavement together with installed sensors becomes of the part of metrological system. It is not possible taking it to the laboratory, i.e. all experiments have to be performed in the field. In addition environmental factors (for instance temperature, humidity, vibrations) influence the properties of weighing site.
- The metrological parameters of the WIM systems have to be checked in the place of their installation and each installation differs in its properties,
- Many types of the load sensor does not operate under static load, so it is not possible to check the errors using constant force standards or mass standards,
- From practical point of view the only way of WIM system calibration depends on application of pre-weighed vehicles, which differ in the gross vehicle mass and passing the tested site many times at different velocity. Such method is expensive end

time consuming.

- Considering this the proper estimation of the time period, in which the calibration has to be repeated is very important.

Development of technical requirements for WIM systems means among others:

- determination of the number of load sensors and their reciprocal distances,
- determination of the set of disturbing quantities, which influencing the weighing result and which have to be measured simultaneously with the weighing of vehicle,
- determination of the borders (limits) of subspace determined in multidimensional space of parameters disturbing the weighing errors, inside which the desired accuracy is guaranteed,
- equipment of the WIM site with the additional sensors allowing the control whether the weighing result is housed inside this subspace, and in consequence such result may be used for enforcement of the allowable gross weight and axle load.

There are many reasons for introducing automatic enforcement of the allowable vehicle weights and axle loads. Not only the quality of roads is to mention (latest research of AGH research team has shown the great influence of overloaded vehicles on increase in costs of road maintenance), but also road safety issues. Protecting road users is not to be underestimated, especially when it comes to analyse the ratio of the mass of the vehicle and its stopping distance. What is more, environment protection is to be considered as well. All those aspects seem to be critical from social point of view. Nevertheless, it is vital to consider also a business approach. Undoubtedly, overloaded vehicles enable emergence of unfair competition. Overloading reduces costs of employment, gas, amortization ect. and increases the speed of delivery, which is vital in competitive struggle. It seems that introducing automatic enforcement of the allowable vehicle weights and axle loads may stop this practises within an automatic imposing heavy penalties on the owners of overloaded vehicles. Moreover, the presented system raises the number of identified overloaded vehicles within reduction of employment costs of inspectors working in field.

This paper describes the technical and legislative activities performed currently in Poland in this field.

Hongmian Gong

Professor, Hunter College of City University of New York, USA

**Combining Web GIS, Smartphone, Social Media and
Cloud Computing for Sustainable and Healthy Mobility**

Mining GPS-based and social media data can provide insights into how and why people travel in large cities and how well transportation meets people's travel needs. This study develops a prototype by which spatiotemporal data of individuals' travels are transmitted from smartphones to a cloud server and run through a GIS algorithm to identify travel modes. Based on the identified travel modes, carbon emission/avoidance and calorie/fat-burned associated with individual travels are calculated and sent back to smartphone users to encourage sustainable and healthy travel mode choices. Tweets from individuals on trip purpose and the conditions of transportation facilities will also be collected through real-time GIS (the GeoEvent Processor for Server in ArcGIS). Trip purpose information will be combined with travel mode results for transportation planning, while tweets on conditions of transportation facilities will be displayed in Web GIS to provide real-time information in case of human-induced or natural disasters such as 9/11 and hurricane Sandy. The advantages of using real-time GIS and cloud computing in extreme events as well as challenges of building an effective prototype in a megacity like New York will also be discussed.

Cristina Gonzalez Rechea

Researcher, Universidad Politecnica de Madrid, Spain

Rosa Maria Arnaldo Valdes

Professor, Universidad Politecnica de Madrid, Spain

&

Victor Fernando Gomez Comendador

Professor, Universidad Politecnica de Madrid, Spain

Designing and Developing New VET Curricula to Address Skills Gaps in the Aeronautics Industry

Aeronautic Industry has a critical responsibility in facilitating European economic growth and social inclusion providing revenues to otherwise isolated regions and allowing people to enlarge their horizons. According to the EU, currently aeronautics and air transport are key drivers of European cohesion and competitiveness, representing 220 billions of Euros and providing 4,5 million of jobs in Europe, a figure that should double by 2020.

To achieve the desirable sustained growth the EU needs to invest in high quality **VET (Vocational Education Training)** in order to be able to supply the **AI (Aeronautic Industry)** with qualified workers.

This paper presents the results of an "initiative" supported by the European Commission called AIRVET. Its main objective is to **design, develop, evaluate and disseminate adapted/new AI curricula and VET courses** in the specific fields of Maintenance and Information and Communications Technologies (ICT). For that purpose the following strategic objectives are defined:

- To foster a dialogue, interactions and networking activities between VET providers, aeronautic experts and bodies involved in education and training systems;
- To improve the knowledge from labor market intelligence to identify skills needs within the AI;
- To offer young people the opportunity to have contact with different real work situations in the AI; and raise its awareness about future career paths in aeronautics;
- To review, create and improve the VET curricula and training programmes and contribute to the implementation of innovative ways of delivering VET.

The main results expected by AIRVET are:

- **Design of Curricula** and **multimedia resources** for training based on innovative ways of delivering VET e.g. Learning based games, 2D/3D graphics, low cost simulations, virtual reality, etc.

- **Pilot Runs:** practical learning sessions in which the dynamic solutions will be tested in order to collect opinions from both the trainers and the participants on the educational programmes and innovative learning approaches.

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Global Transport System Efficiency

With growth of world trade through very turbulent international market transportation systems are faced with new requirements. The global transport system more than before become the subject of modern supply chain study. Transportation systems are identified with the theoretical foundations of the supply chain. Modern supply chain studies the concept of optimizing the transport systems as part of the global supply chain. Each chain including supply chain consists of a series link. Chain break at the weakest link, as well as the supply chain usually due to the inefficiency of their link. This article attempts to analyze the efficiency of the global transportation system through the efficiency of the supply chain, or the force of each of its links. The global multimodal transport operator (GMTO) is placed in the origin of the functioning of the global supply chain as an example of such a global transport system. The efficiency of the global transportation system is the resultant efficiency of its components. The role of multimodal transport operator (MTO) in taking responsibility for meeting the interests of the consignee of goods. The consignor, or the client, the contractor of the multimodal transport given the right to multimodal transport operator (MTO) on his behalf performs transportation. Consignee thus remains more space to devote to market and sale of their products. Global multimodal transport operator (GMTO) leaves the possibility of setting up a competitive global transportation system that per unit of goods will not affect the substantial increase in prices and supply conditions. The global transport system will be effective only if its components are individually effective. Each component of the transport system must be the subject of optimization. This article attempts to analyze optimization of each link of the global supply chain which is reflected in the logistics concept with decision-making and management to implement new solutions.

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Bridge as an Environmental Check-Point

The aim of the paper is to characterize the inconsistencies appearing during the bridge design process and maintenance. Several examples of the road-bridge investments carried out in Poland in the last decade have created the basis to formulate some opinions and questions. The difference between the approach of bridge engineers and that of environmental ones to the concept of animal transition is shown on the grounds of implemented technical and environmental standards. The existing problems are of dual nature, the first group being very general issues i.e. concerning the concept of ecology, while the other one involves detailed tasks, e.g. the image of bridge shaping. Several questions of great significance have been formulated and addressed to ecologists. The answers are indispensable for bridge engineers to solve technical aspects of the proper design of environment-friendly bridges. Last but not least, the suggestion to use bridges as places to monitor the environment in their surroundings is presented. This research work might be crucial for further good cooperation of bridge engineers and environmental ones.

The monitoring of bridges, even if is not common, works in special cases. Lots of suspension or cable-stayed bridges are supplied with facilities to observe strain, stress or displacement processes. The archiving could be done on hard discs or in the cloud. The only action is to develop and unify the existing systems and adopt them to environmental needs. Having a good archive it will be easier and more reliable to formulate challenges for road-bridge solutions in sustainable design.

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Conservative Power Theory (CPT) Method Applied in the Indirect Current Control for Active D.C. Traction Substations

In the paper a control method for a filtering and regenerative system is analyzed. This allows the conversion of the classical dc traction substations in active traction substations. The main properties of the active traction substations are that they absorb, from the power grid, only the active current, in the same time, they can inject active current to the power grid. That means that the harmonic current of the traction rectifier is compensated by the active compensator and the braking energy can be recovered to the power grid.

After a brief introduction in the 1st section, the 2nd section presents the filtering and recovery component of the active substation. This system contains a shunt active compensator with IGBTs and a unidirectional circuit for the interface between the compensator and the catenary. The active compensator is connected on one side to the catenary through the separating circuit, and on the other side, to the power grid through the step up recovery transformer.

The description of each block is followed by the control block structure substantiation based on the indirect current control and the active load current computation, in the 3rd section. The control part is a cascade structure that contains two loops, one very fast for control of the grid current and other for DC voltage control. The desired grid current is computed by adding two currents. First is the active current absorbed by the traction rectifier, using the Conservative Power Theory (CPT), the newest theory about non-sinusoidal regime, developed by Paolo Tenti. The second component is the active current required to cover the losses into the active power filter and to keep constant the compensating capacitor voltage. This current is obtained from the DC voltage controller (PI controller). The desired grid current is compared to the real grid current and the error is applied to the current controller (hysteresis controller).

Thus, the 4th section, the main part of the paper, presents the active current definitions based on the CPT under non-sinusoidal voltage.

Further, in the 5th section the paper details the complete Simulink model of the regenerating and compensating system for dc traction substations with 12-pulse bridge parallel rectifier. The obtained simulation results are illustrated in the 6th section. The model is analyzed for the filtering mode, as well as, for the recovery mode.

The last section emphasizes the experimental results, for the filtering mode, obtained by implementing the proposed control method, this time, on a scale model of the regenerating and compensating system for dc traction substations with a six-pulse bridge rectifier. The conclusions, concerning the performances and advantages of the analyzed system, are drawn at the end of the paper.

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A New Traffic Safety Agenda: Incorporating Transportation Demand Management Safety Strategies

Traffic accidents impose huge costs on individuals and society, so traffic safety is a major transport planning objective. Most conventional traffic safety programs focus on reducing distance-based crash rates, such as deaths and injuries per billion vehicle-kilometers. Measured in this way, increases in per capita vehicle travel are not significant risk factors and vehicle travel reductions are not recognized as potential traffic safety strategies. A new traffic safety paradigm measures crash rates *per capita*, as with other health risks, and so recognizes the safety benefits of transport policies which reduce per capita vehicle travel. Research described in this presentation indicates that vehicle-travel reduction strategies, such as improved public transit services, transport pricing reforms and smart growth development policies, can provide large traffic safety benefits: residents of more multi-modal communities have about a fifth the per capita traffic casualty rate as automobile-oriented communities, and many policies that encourage use of alternative modes also increase transport safety and security. However, these benefits are often overlooked in conventional traffic safety planning. This presentation identifies a new traffic safety agenda that includes demand management as a traffic safety strategy. It describes specific ways that individuals, transport planners, traffic safety experts and policy makers can take advantage of these opportunities to increase safety. It describes a comprehensive framework for comparing the full benefits of potential traffic safety strategies, including indirect costs and benefits. It discusses the implications of this new traffic safety agenda, and identifies transport policy and planning reforms that can help support its implementation.

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Measuring the Inertia Effect on Mode Choice: A Panel Data around a New Tram Implementation

A panel data with information before and after changes in the transport supply offers a great opportunity to analyze temporal effects in the transport mode choice behavior. One of these effects is the inertia, which relates the past experiences with the current choices. In the case of mandatory trips (work and education), the mode choice process usually involves a inertia effect because users tend to repeat their usual choices even when new and efficient transport alternatives are introduced. Due to transport policy aims at the change of the user behavior, obtaining accurate inertia measurements is crucial to make optimal decisions.

In this paper, we analyze the impact of a tramline implementation in the Santa Cruz-La Laguna corridor (Tenerife, Spain) on the travel mode choice of a group of college students (University of La Laguna). Using a common set of individuals, we built a three waves panel data before and after the introduction of the tram. The first and the second waves conducted in 2007 collect information about Revealed Preferences (RP) of actual transport mode choices as well as Stated Preferences (SP) in a simulated scenario considering the hypothetical choice between the tram and the transport mode currently chosen by the students. The third wave gathers information about RP in 2009, two years after the tram started operating. With this information, we evaluate the inertia effect between RP-2007 and SP-2007 as well as between RP-2007 and RP-2009. Specifically, we estimate several panel mixed logit models with mixed RP/SP datasets allowing for correlation across observations from the same individual and random variations in the inertia effect. Our results confirm a significant inertia effect among the car users. This finding goes in contradiction with one of the main objectives of the tramline implementation, which was to increase the share of public transportation and decrease the usage of cars for mandatory trips.

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Wardrop Equilibrium for a Network with the BPR Latency Function

A non-cooperative two-person game which is considered. There are two transport companies which serve the stream of passengers on the graph of parallel routs. The delay on the edges of graph is BPR-function. The stream of passengers forms the Poisson process with intensity a . Players declare prices for service c_1 and c_2 respectively, and passengers choose the service with minimal costs. The cost consists of the price for the ticket and the cost for the time in journey. So, the incoming flow divides on two Poisson flows with the intensities a_1 and a_2 , where $a_1 + a_2 = a$. The problem of pricing for each transport company in the competition is solved. Also the increase of the number of players is carried out.

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**The Pedestrian Esplanade: An Inquiry into the Generative
Urban Design Process of C. A. Doxiadis**

In 1956, Constantinos A. Doxiadis launched the international publication *Tropical Housing and Settlements Monthly Bulletin* aiming to establish his authority and expertise in national, urban and architectural development programs for South East Asia, Africa and the Middle East. The tropical region with its new post-colonial nations presented Doxiadis with the ideal tableau upon which he would formulate a new modern synthesis of urban and architecture forms. The 1957 project to design a post-colonial campus for the University of the Punjab in Lahore Pakistan ideally matched Doxiadis desire to formulate a new spatial synthesis embracing architectural, social community and urban scales. In this paper I trace how Doxiadis Associates devised a structural and spatial design scheme for the University of the Punjab campus based on modern tropical university precedents and the historic Mughal Lahore palace and fort architectural complex. Through morphological analysis of the University of Punjab campus and subsequent university projects undertaken between 1957- 1959 in Greece and the Middle East, I demonstrate how Doxiadis formulates the concept of the 'pedestrian street' as a new urban architectural spatial type. The analysis demonstrates how Doxiadis tropicalizes the architectural form of the European university, integrating local social cultural dimensions to formulate a new open public space that embodies principles of social integration, spatial knowledge, and movement. Iterative design development of the pedestrian street in subsequent university projects undertaken by Doxiadis is transformed into the 'pedestrian esplanade', a unique design structure first introduced in the 1959 sophisticated urban plan for the Eastwick Redevelopment project in Philadelphia. The emergence of this new urban spatial type applied in the Eastwick redevelopment project highlights a transformation in Doxiadis architecture and urban design ideas that may be comparatively contrasted to the pedestrian street formulations by the firms van den Broek Bakema, the Smithson and Canidlis- Josic -Woods.

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Synchronous Reference Frame Method Applied in the Indirect Current Control for Active DC Traction Substation

The paper is focused on the indirect control of the current by calculating the active component of the load current, in active DC traction substations. In this mode, both the braking energy recovery and active filtering function are ensured. By adopting the Synchronous Reference Frame (SRF) method to calculate the desired current drawn from the power supply, sinusoidal waveforms of the current are prescribed, so that the perfect harmonic cancelation (PHC) compensation strategy can be implemented. The paper is organized in the following sections: Introduction; Structure of regeneration and active filtering system; Indirect control system structure; SRF under nonsinusoidal voltage in three-phase systems; Simulink model of the system; System performances by simulation in active filtering and regeneration modes; Experimental results; Conclusions. First, the structure of the system for regeneration and active filtering (named SISFREG) is presented, in which an active power filter (APF) consisting of an IGBT-based voltage source inverter (VSI) is the main component. It is highlighted the intrinsic capability of APF to provide an imposed increased value of the DC-bus voltage and the necessity of connection to the catenary line through a proper separating circuit in order to ensure the regeneration function of the system. As regards the point of common coupling (PCC) of APF, it is shown that, without adding a boosting circuit in the DC-side, it can be the traction transformer secondary transformer only in the case of traction substation with 12-pulse series rectifier. A dedicated recovery transformer is required in the case of 12-pulse parallel rectifier and 6-pulse rectifier, which are the most used types of uncontrolled rectifiers in the existing DC traction substations. Then, the attention is directed to the structure of the system for the indirect control of the current, including the block of generating the reference supply current and the current controller. The use of SRF method in the set current calculation is described under both sinusoidal and nonsinusoidal voltage conditions. Next, the Simulink model of the whole active DC traction substation is presented. The practical case of DC traction substations with 12-pulse parallel rectifier is taken into

consideration. The results of simulation, in terms of waveforms and power quality and energy efficiency indicators, make evident the good performances of the system in both compensation and regeneration regimes. Some experimental results achieved during the compensation regime in the case of 6-pulse rectifier validate the theoretical approach and simulation model. Finally, some concluding remarks are drawn.

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Modelling of Pedestrian Crash Rates and Prediction Functions

Pedestrian fatalities and injuries are of major concern to transportation engineers, planners, and the public. In 2011, 4,432 pedestrians were killed and an estimated 69,000 were injured in traffic crashes in the United States. This fatality rate represents an increase of 3 percent from 2010. For this same year, pedestrian deaths accounted for 14 percent of all traffic fatalities, and made up 3 percent of all the people injured in traffic crashes. The state of Florida continues to be the highest in terms of number of pedestrian fatalities. Pedestrian crash rates have been calculated using different methodologies depending on the location of these crashes such as mid block or intersections. The exposure measure used for estimating these rates has not been standardized due to the variations in numbers of pedestrian activities in different land use. The Highway Safety Manual (HSM) provides a means for estimating average crash frequency for a specific traffic facility using regression models developed from historical crash data. HSM proposes Safety Prediction Functions (SPFs) for base conditions of a number of different traffic facilities, including urban/rural highways and intersections. Numerous studies reported on different mathematical modeling techniques to predict pedestrian crash rates including Exposure Models, Hot Spots Models, Density Models Probit Models, and Negative Binomial Models. This paper provides findings of a research effort aimed at developing a methodology to measure pedestrian crash rates against statewide averages. Two proposed methodologies, mid block and at intersections, were researched and applications of these methods were tested at selected sites in the state of Florida.

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Optimum Training Sample Size for Travel Mode Detection using Smartphone

Smartphones are increasingly getting popular day by day. They are capturing the major share of the mobile market all over the world. Almost all of the smartphones come equipped with a lot of sensors including GPS and accelerometer. These sensors have unlocked new possibilities. In this study, mobile technology is used to solve one of the problems present in the transportation sector. A methodology is described where accelerometer data collected with the help of smartphones can be utilized to automatically predict the mode of transportation used by the phone carrier. A comparison is done among varying percentages of the training datasets to propose the much needed optimum training sample size. It is shown that a ratio of 40%:60% between randomly selected training and testing datasets is appropriate when the percentage improvement is restricted to at least 0.1%.

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Convergent Validity of In-Vehicle Data Recorder (IVDR)

IVDR data, Traffic violations and complaints are used as proxies for the risk of car crash involvement. The IVDR system, which included a Mobileye system, was used to monitor several perilous real time driving events, such as: Lane Departure without turn signal (LD), unsafe Head-Way distance (HW) between the vehicle and other bodies (vehicles, pedestrians etc.), as well as Forward Near Collision (FNC).

In our research, we test the convergent validity of IVDR data as a real indicator tool to measure the risk of car crash involvement by trying to prove a relation between the IVDR events and recorded incidents (such as: crashes, violations and complaints). The research was based on data from 77 professional drivers from a large bus company in central Israel and included: self-report data regarding car crash involvement and violations (police tickets) and data provided by the bus company for the car crashes records (number of accidents recorded in the last year before participating in our research), reckless driving complaints ("How am I driving?" sticker reports) and IVDR data.

A correlation was found between the Mobileye risk score and car crashes records ($r= 0.25$, $p=0.05$), complaints ($r= 0.25$, $p=0.05$) and the self reported crash involvement ($r= 0.33$, $p=0.009$). The specific IVDR events that were found associated with car crash involvement were: urban FNC (Operating up to 30kmh) was correlated with car crashes records ($r= 0.30$, $p=0.02$) and unsafe HW was correlated with car crashes self reports ($r= 0.39$, $p=0.002$). LD events were correlated with self-report number of police tickets($r= 0.29$, $p=0.02$). We conclude that the IVDR system was found correlated with other measures of drivers' safety behavior and risk for crash involvement. The results of this research support the significance of Mobileye IVDR system as a valid indicator for driving safety among professional drivers.

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Updated Guidelines for Left-Turn Phase Selection

A fundamental objective of traffic signal operations is the development of phasing plans that reduce delays while maintaining a high level of safety. One issue of concern is the treatment of left-turn phasing, which can operate as a protected movement, a permitted movement yielding to conflicting traffic, a combination protected-permitted movement or as a split-phase intersection. While protected-only movements can improve safety for the turning movement, they can also increase delays and congestion at the intersection. Most states maintain independent guidance for determining left-turn phasing; however, the most common identified guidance for protected left-turn phases is the use a threshold based on the cross product of the left-turn volume and opposing through movements. The use of the cross product has been questioned recently as an indicator for determining phase selection. Based on simulation analysis within this research, the cross product is shown to be a poor indicator of left-turn capacity and congestion at the intersection.

This research proposes a simplified single variable exponential model to determine left-turn capacity based on opposing volume and percent green time to determine left-turn capacity thresholds for protected left-turn phasing. The model is developed based on observed capacity from 450 VISSIM microsimulation scenarios which evaluated varying opposing volume, opposing number of lanes, cycle lengths and green time splits. Validation of the model based on complex Highway Capacity Manual procedures, indicates that the proposed model provides similar correlation to observed capacities. Finally, a nomograph is developed which presents the model in a simple form for interpretation and application by practicing traffic engineers, when required to determine left-turn phasing options. This procedure allows simple determination based on minimum input data needs similar to the cross product determination, without the need for complex hand calculations or computing requirements of the Highway Capacity Manual.

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Validating the Capability of GPS/GNSS Tracking Driving Behaviours in Various Scenarios

It can be comparably low-cost and ecologically valid to assess driving behaviours using Global Positioning System (GPS) tracking vehicle movement. GPS provides a feasible way to continuously measure the position, velocity and acceleration of a vehicle under typical driving conditions. Close-to-reality vehicle movement trajectories recorded by GPS combining other spatial information may help detect not only some of driving errors, but also different levels of driving performance, such data would also be valid for discriminant analysis in driving behaviours for cohort populations, such as older drivers, especially when observation data lacks of sensitivity to subtle variation of driving manoeuvres. However, the capability of GPS recording in different scenarios using different GPS receivers hasn't been fully explored.

This paper presents methods to systematically validate the capability of GPS recording vehicle movements to assess driving behaviours in various scenarios using both recreational and survey receivers. The field trails included a series of GPS recording driving paths incorporating turns, speed changes and lane changing behaviours. The consequent data analysis provide a picture of the suitability and reliability of GPS recording vehicle movements, and hence the possibility for the use of GPS recording to assess driving behaviours. This study recommends that recreational-grade GPS receivers can record vehicle movement at lower resolution, which can be used to investigate navigation and wayfinding behaviours. The low-cost code-only GPS survey receivers is able to record vehicle movement positions at centimeter-level accuracy, which can be used to assess traffic sign compliance, speed regulation and driving manoeuvres. The carrier-phase GPS survey receivers is suitable for Real-Time Kinematic (RTK) recording, which can reach decimeter-level accuracy and is able to record lane maintenance behaviour. Nevertheless, multi-GNSS technique would be a better approach to obtain higher position

accuracy with increased number of satellites compared to GPS-only positioning, particularly in harsh urban transport environments.

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Indirect Current Control of a Filtering and Regeneration System used in DC Substations for Urban Traction

The most urban railway vehicles are driven by electric motors which are supplied by an overhead line using a pantograph or by a third rail. The dc energy is delivered by the traction substations located along the railway line, which are composed of a traction transformer and a six or twelve pulse diode rectifier. In the intervals when the trains are braking, the kinetic energy is converted by the train motors in electric energy, energy which is reused in a very limited extent, and only for the train auxiliary services. If there is no other train accelerating nearby, to use the unused braking energy, the grid voltage increases and this supplementary energy is lost on braking resistances.

If the traction substation meets the concept of active substation, in parallel to the traction rectifier an active filter is mounted so the substation is absorbing only active power from the high voltage grid (because the active filter compensates the rectifier current) when the trains are consuming power, and provides active power back to the power grid when the trains are braking.

An easier control method for a filtering and regeneration system (SISFREG) proposed by the authors is analyzed in this paper. This system converts the dc traction substation, with 6-pulse three-phase bridge rectifier, in an "active substation".

After a brief introduction, the paper presents the filtering and regeneration system structure, in the 2nd chapter. The main element of the regeneration and filtering system is a shunt active power filter, connected between the traction line, through a unidirectional interfacing circuit, to the primary winding of the traction transformer through a dedicated transformer.

The 3rd chapter is dedicated to the active filter current control loop which uses the indirect current control method. This assumes the control of the grid current instead of the filter output current, the desired current being obtained based on the DC-Link voltage controller.

The 4th chapter illustrates the system Simulink model and also the obtained performances for the filtering mode, as well as, for the energy

recovery mode. The system rated values corresponds to a traction substation related to the underground Bucharest railway.

The results obtained by simulation were experimentally verified in the 5th chapter using a scale model of the active filtering component of the active substation. Although the scale model does not contain the traction rectifier and dc line, the control algorithm of the SISFREG was completely validated in the filtering mode.

Finally, the conclusions are drawn, concerning the performances and advantages of the analyzed system.

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Contemporary State of Load Shipments in Small Batches in the Cities of Republic of Bulgaria

The paper claims that the development of micro, small and medium enterprises in the Republic of Bulgaria in the last twenty - twenty-five years resulted in a considerable increase of goods senders as well as load recipients. Changes in the economy increased significantly transportation of cargoes in small batches for easy delivery routes in cities. At the same time the formed market relations in the conditions of undetermined and unsustainable environment require highly efficient methods of shipment organization for increasing service quality. Review is made on the main difficulties in the shipment organization in the conditions of Bulgarian cities.

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**From Present Car Dependency to Future Public
Transportation in an Island Region, Okinawa**

Okinawa is an island region located in southernmost part of Japan. The main island, Okinawa Is., has a population of 1.2 million in the area of 1200km². Present situation of transportation in Okinawa Is. is only road traffic except for one monorail line of 13km. This situation causes serious car dependency and worse urban environment. A survey about car dependency was carried out and the results show lack of adequate public transportation system. A field observation for urban thermal environment was also carried out to reveal the effect of car traffic on air and surface temperature around a road and concentration of CO₂. Some thermo-grams of the surface temperature show higher surface temperature on cars in the daytime and higher road temperature in the nighttime. An investigation on the monorail and the bus network indicated that the number of passengers of the monorail is almost stable but the passengers of bus network are decreasing. Tourism is a significant industry in Okinawa and the number of tourists has been over 5 million per year since 2003 and still increasing year by year. The monorail is running from the airport to an old castle as a scenic point for tourists passing through the downtown. It is very convenient for the tourists and over 50% of passengers are occupied by the tourist. However, the tourists do not use the bus network. Real public transportation system for the residents does not exist in Okinawa. Many residents are longing for real public transportation system, especially railroad system, except for the monorail and the existing bus network. Several plans of railroad system have been proposed by several authorities and private companies. These plans are introduced and examined. Finally, a practical idea and the problems to realize the plan are proposed and estimate its effect on urban environment.

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Rail Village and Mega-Structure - A Case Study of Hong Kong

Half of the world population of seven billion lives in Asia. Hong Kong typifies the overcrowding problem of Asian cities. The total area of Hong Kong—including the main islands, peninsula and outlying islets—is 1,120 square kilometers, of which 76 square kilometers was acquired through reclamation. In Hong Kong's 1,120 square kilometers of land, the built area covers only a quarter, less than 300 square kilometers, and accommodate seven million residents and 50 million visitors annually. The only way to cope with the large population and crowded environment is to make built environment denser. Transit-oriented-development (TOD) was introduced in Hong Kong in the 1970s.

Most of the TODs used high-rise and high-density architectural designs. For TOD projects, the current study uses 5D principles to measure Density, Diversity, Design, Distance to transit and Destination accessibility. The 5Ds demonstrate the effectiveness of a TOD.

Since 1979, the metro rail in Hong Kong has served the old community and new reclamation land. The planning of rail lines and property developments generally follows the principles of the 5Ds. Because of the number of people, narrow roads and accessible public transportation, 90% of Hong Kong residents use public transportation. The rail villages profoundly influence the city planning of the territory.

This paper selects one station on the East Rail (Shatin) Line, an early MTR (mass transit railway) station (Kowloon Bay) and five stations on the Tung Chung Line. The author will examine how station and rail village work interactively and how the megastructure facilitate such rail village. The design of station megastructure is particularly analyzed in its formation, characteristics and impact to the city. The construction and operation of rail village will inspire the other cities which face the similar problem of large population and crowded environment.

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Evaluating the Contribution of Transportation and Logistics Industry to Turkey's Competitive Power

Competitiveness is an irrefutable phenomenon in liberalized, privatized and globalized business environment at the level of both corporate and economies. In such conditions countries tend to reach more international trade volume to be more competitive and to increase country's economic growth rate. Meanwhile, logistics industry, particularly transportation, as a facilitator in international trade grew significantly while logistics became a significant part of the business economic system and major global economic activity in recent years. Today, logistics is becoming a vital element of competitiveness and economic performance both in itself and within the context of increasing globalization.

Turkey has a plan to improve its economic position through increasing international trade volume, simultaneously wanting to increase its competitiveness in logistics as well. Since the aim of this paper is to evaluate the competitive power of logistics industry in Turkey, Logistics Performance Index (LPI) is analyzed without neglecting its facilitator role in business life and relationship with economic competitiveness. While analyzing LPI, a qualitative comparison is done with Global Competitiveness Index (GCI).