7th INTERNATIONAL CONGRESS ON TRANSPORTATION RESEARCH
From basic research to innovative applications

5 & 6 of NOVEMBER 2015

AMPHITHEATER
Ministry of Infrastructure, Transport and Networks

www.ictr.gr

DETAILED PROGRAM
ADDRESS BY THE CHAIRMAN OF THE SCIENTIFIC COMMITTEE

The 7th International Congress on Transportation Research in Greece (ICTR 2015) proves once more that the Greek research and scientific personnel along with a large number of agencies and firms from the public and private sectors, is successfully involved in research and technological development as well as in innovative applications in the Transport sector, often beyond its expected capabilities. The high quality and the wide range of the content of the submitted papers in this conference are the undeniable witnesses of this reality. The same applies to the papers submitted by the young researchers covering 25% of the total submissions. The young researchers participate as a distinct category for the second consecutive time in this conference demonstrating their potential and the prospects of this new generation.

Personally, I feel quite honoured and happy that I was part of the conference organising team and responsible for the programme; an event that is organized since 2002 by the Hellenic Institute for Transport (HIT) of the Centre for Research and Technology Hellas (CERTH) and the Hellenic Institute of Transportation Engineers (HITE). I also feel quite pleased and satisfied that I was able to cooperate with a large number of important and meritorious colleagues and associates for a common goal, that of another successful conference on Transport Research in a really difficult era in any aspect. I would like to deeply thank them all; without their contribution this event wouldn’t be possible.

Finally, I must say that this event is special for another important reason; the two organising institutes will honour the initiator of the HIT/CERTH establishment and also founder of the ICTR series, emeritus Professor and member of the Athens Academy Dr George Giannopoulos. This honorary award comes as a distinction for his long-lasting, continuous and high level contribution to the Transport Engineering science and to the Transport Research community.

I truly believe that the conference participants, regardless of their role, will have the opportunity to attend presentations of high level as well as to discuss and to exchange views in the scientific areas of their interest. The presence of Dr Vito Mauro from Italy who will make the keynote speech entitled “From research to applications: the ITS experience” will be an additional stimulus for the audience and will add extra value to this event.

I wish you a fruitful and unforgettable two-day event.

Sincerely,

Prof. Panos Papaioannou
Professor of the Aristotle University of Thessaloniki
Chairman of the Scientific Committee
ADDRESS BY THE CHAIRMAN OF THE ORGANISING COMMITTEE

The 7th International Congress on Transportation Research (ICTR 2015), co-organised by the Hellenic Institute of Transportation Engineers (HITE) and the Hellenic Institute of Transport (HIT) of the Centre for Research and Technology Hellas (CERTH), continues the tradition of the previous congresses and it has been established as the benchmark for the research in transportation in Greece. It consists a significant milestone in the modern research in the transport sector in Greece and it is addressed to all members of the scientific community as well as to the agencies of all levels of policy making.

In a period of steep economic crisis and limited funding allocated for research and development (the relevant expenditures as a percentage of the national GDP in 2013 was 0.78%, when the respective percentage at an EU level reached 2%), the Greek scientists and researchers prove that research and innovation can play a significant role in the technological evolution and scientific progress, two crucial elements for the economic recovery of Greece. The transport sector consists a basic pillar of economic development; therefore novel applications based on outstanding research results are of particular importance. For this reason, the central theme of this congress “From basic research to innovative applications” is very important.

With my capacity as Chairman of the ICTR 2015 Organising Committee I would like to thank all members of the Committee for their cooperation and devotion so that another International Congress on Transportation Research is successful. Furthermore, I would like to thank the Ministry of Infrastructure, Transport and Networks that gave us the Conference Hall, the reviewers and sponsors for their support. I am confident that this event will continue the tradition created by the six previous congresses.

I wish success to the congress’ activities.

Sincerely,

Yannis Tyrinopoulos
Assistant Professor of the Technological Educational Institute of Athens
Chairman of the Organising Committee


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THURSDAY, 5 NOVEMBER 2015

9:00 – 9:30 Welcome - Registration

9.30 – 11.30 Special Session: Theses presentation of young researchers
Chair: C. Antoniou – Y. Tyrinopoulos

11:30 – 12:00 Coffee Break

12:00 -13:00 Greetings
Honorary award ceremony for Professor G.A. Giannopoulos
Chair: P. Papaioannou

13:00 – 13:45 Keynote Speech
From research to applications: the ITS experience.
Vito Mauro

13:45 – 14:30 Lunch Break

14:30 – 16:00 Session A: Urban Mobility: Theory and Applications
Chair: A. Stathopoulos - C. Pirgidis

3. Alternative-collective patterns of ownership and use of passenger cars in the city.
Ioanna Palanta and Christos Taxitaris

31. Traffic Calming measures: Users’ Level of acceptance development through time.
Panagiotis Iordanopoulos, Katerina Chrysostomou and Evangelos Mitsakis

10. Evaluation Methodology for bikeway characteristics in a mid-size city in Greece.
Athanasios Galanis, Pantelis Kopelias, Evangelos Bourazanis, Ioannis Kaltsas and Nikolaos Eliou

57. Impacts of the economic crisis on mode choice and trip frequency of urban transport systems.
Apostolos Papagiannakis, Giannis Baraklianos and Alexia Spyridonidou

54. Attitudinal survey for the urban maritime transport in the city of Thessaloniki, Greece.
Alexandros Dolianitis, Socrates Basbas, Magda Pitsiava-Latinopoulou, George Mintsis and Ioannis Politis

16:00 – 16:30 Coffee Break

16:30 – 18:00 Session B: Issues in Transport Policy and Economics
Chair: E. Sambracos – I. Gollas

34. The future of transport in Europe: Addressing the Challenges.
Maria Bolle, Angelos Angelakakis, Anastis Papanikolaou and Alkiviadis Tramaras

Andreas Nikiforidis, Anastasia Roukouni, Socrates Basbas, George Mintsis and Christos Taxitaris

80. Peak Car Effects on Scheme Appraisal.
Christina Spiliopoulou and Constantinos Antoniou

Christina Milioti, Matthew Karlaftis† and Eleni Akkogiounoglou

81. Highway Infrastructure Investment and Economic Growth at the MSA Level; Accounting for Spillover Effects.
Eirini Kastrouni, Xiang He and Lei Zhang
Srinath Ravulaparthi, Ioannis Tsouros and Konstadinos Goulias

11:30 – 14:30 Parallel Poster Session A: Research Theses
Theologia Moustaka, Konstantinos Keaptsoglou, Nikolaos Lagaros and Matthew Karlaftis†
12. Regional rail connection between Thessaloniki and Larissa. Evaluation of the current situation and proposals for the improvement of the level of service provided.
Nikoleta Tsougeni and Christos Pyrgidis
Rafail Katkadigkas and Christos Pyrgidis
Paraskevi Katachanaki, Emmanuell Barmpounakis, Eleni Vlahogianni and John Golias
Lampros Alexandros Papadoulis, IIlias Gkotsis, Eleni Vlahogianni, Konstantinos Keaptsoglou, John Golias and Christina Miloti
Georgios Georgiadis and Panagiotis Papaioannou
25. Soft mobility scenarios for a sustainable city.
Stella Strataki
27. Comparative assessment of road infrastructure sustainability rating systems.
Evdokia Iliaidou, Nikolaos Eliou and Alexandros Zouros
36. Game-theoretical Investigation of Supply and Demand in Aviation Markets.
Ioanna Pagoni and Voula Psaraki-Kalouptsidi
37. Optimal detour choice in an urban freeway.
Vyronas Sarantidis, Pantelis Kopelias, Nikolaos Eliou and Eleni Tyrogianni
38. Effect of vehicle collision type on road accident severity in Greece.
George Yannis, Panagiotis Papantoniou and Olga Reitzopoulou

15:00 – 18:00 Parallel Poster Session B: Research Theses
40. Applications of laser scanning technologies in transport operations.
Ioulia Markou, Constantinos Antoniou, Maria Tsakiri and Andreas Georgopoulos
44. Evaluation of Roadside Wrong-way Warning Systems with Different Type of Sensors.
Jian Xing
46. Comparison of macroscopic and microscopic emission estimation approaches in the evaluation of ITS.
Sokratis Mamarikas, Evangelos Mitsis, Evangelos Mitsakis and Josep Maria Salanova Grau
47. Influencing factors of pedestrian velocity under constraints.
George Kousoukulis and Constantinos Antoniou
49. Developing a Sustainable Mobility Plan in Piraeus with Special Emphasis on Cycling.
Efthimios Bakogiannis, Avgi Vassi, Maria Siti and Georgia Christodouloupolou
67. GPS Data Collection for Active Transport Modes and Design of Real Life Experiments.
Ioannis Tsouros, Amalia Polydroopoulou and Konstadinos Goulias
68. Rhythms in Urban and Island Areas: Does Lifestyle Affect Daily Dynamics?
Ioannis Tsouros, Amalia Polydroopoulou, Konstadinos Goulias and Athena Tsirima
71. Development of a Methodological Framework for Predicting Containers’ Dwell Time in Marine Container Terminals – First Results.
Ioanna Kourounioti, Amalia Polydroopoulou and Xristos Tsiklidis
73. Analysis of Preferences for the Use of Bicycling Sharing System in Athens.
George Yannis, Panagiotis Papantoniou, Eleonora Papadimitriou and Athina Tsolaki

18:00 – 20:00 Cocktail
FRIDAY, 6 NOVEMBER 2015

9:00 – 11:00  Session C: Research and Applications in Road Safety
Chair: G. Yannis – V. Halkias

Ilias Keppas and Yannis Tyrinopoulos

5. Methodology for the analysis of the interurban road network in the context of integrated seismic risk management.
Nikolaos Gavanas, Alexandros Sdoukopoulos, Anastasios Tsakalidis and Magda Pitsiava-Latinopoulos

16. Pilot implementation of e-Call system in Greece.
George Patsiavos, Sofia Papathanasopoulos, Panagiotis Papaspiliopoulos, Dimitris Margaritis, Alexander Stathacopoulos, Evangelia Portoul and Aikaterini Pagle

23. Investigation of motorcycle riders’ behavior on rural roads’ junctions.
Panagiotis Lemonakis, Nikolaos Eliou and George Botzoris

Sophia Vardaki, Anastasios Dragomanovits, Evangelia Gaitanidou, Evangelos Bekiaris and George Kanellidis

79. Spatial road safety modeling leveraging crowd-sourced publicly available geographic data.
Loukas Dimitriou, Dimitrios Efthymiou and Constantinos Antoniou

11:00 – 11:30  Coffee Break

11:30 -12:30  Intervention by Ms P. Perka, General Secretary for Transport

Sponsors Speeches
Initiatives for the establishment of an integrated network of toll highways in Greece.
Vasilis Halkias

New Technologies for Road Safety: Shotblasting.
A. Spondylidis, E. Kokkinakis

Award of young researchers

12:30 – 13:45  Session D: Environment and Energy in Transport
Chair: K. Vogiatzis - E. Bekiaris

6. Comparison of population exposure results at airport noise zones using different noise prediction softwares (INM, IMMI/CadnaA) in the framework of the Corfu strategic noise map.
Konstantinos Vogiatzis, Charalampos Antoniadis, Pantelis Kopelias and Eleni Misokefalou

32. Impact of light conditions on traffic flow.
Charalampia Lagou and Ioanna Spyropoulou

Dimitrios Efthymiou, Katerina Chrysostomou, Maria Morfoulaki and Georgia Aifantopoulou

30. Evaluation of positive & negative effects from the use of anti-noise barriers as a mitigation measure for road traffic environmental noise.
Konstantinos Vogiatzis, Nikolaos Eliou, Pantelis Kopelias, Eleni Misokefalon and Charalampos Antoniadis

35. Effects of C-ITS on the Environmental Footprint of Vehicular traffic at Signalized Intersections.
Evangelos Mintsis, Josep-Maria Salanova Grau, Evangelos Mitsakis and Georgia Aifantopoulou

13:45 – 14:30  Lunch Break
14:30 – 16:15  **Session E: Policy, Management and Operational aspects in Mobility**
Chair: G. Aifantopoulou – N. Eliou

8. *The exploitation of a controlled parking system in the Municipality of Thessaloniki. Calculating the impacts of alternative parking pricing policies and estimating scenarios.*
Maria Morfoulaki, Kornilia Kotoula and Glikeria Myrovali

26. *Simulation-based evaluation of evacuation effectiveness using sensitivity analysis*
Margarita Kostovasili and Constantinos Antoniou

52. *Assessment of LOS at pedestrian streets and qualitative factors. A pedestrians’ perception approach.*
Olga Lazou, Aggeliki Sakelariou, Socrates Basbas, Evangelos Paschalidis and Ioannis Politis

53. *Efficient Management of parking under constraints.*
Vasileia Papathanasopoulou, Ioulia Markou, Constantinos Antoniou, Vassilis Gikas, Athanasios Mpmis, Haris Perakis and George Yannis

75. *Policies for Enhancing Mobility in Academic Campuses: The case of CERN*
Athena Tsirimpa, Ilias Gkotis, Konstantinos Kepapsoglou, Eleni Vlahogianni, Amalia Polydoropoulou and Matthew Karlaftis

41. *A Holistic Approach of the Correlation between GDP and Air Transport through Panel Data Analysis.*
Vassilios Profillidis, George Botzoris and Stylianos Taxidis

16:15 – 16:30  **Coffee Break**

16:30 – 18:00  **Session F: Methodological aspects and applications in Freight and Logistics in Transport**
Chair: A. Ballis – M. Boile

63. *Capitalization of MED projects’ outcomes: recommendations for integrating project outcomes into policy frameworks.*
Konstantinos Papoutsis, Eliza Gagatsi, Georgia Aifantopoulou and Panagiotis Tzenos

69. *Multi-stakeholder Assessment of Smart Solution in Urban-Interurban Freight Transportation Interfaces.*
Eftichia Nathanail, Michael Gogas and Konstantinos Papoutsis

78. *Advanced Cargo Transport Information Services Platform.*
Eleftherios Sdoukopoulos, Afroditi Anagnostopoulou, Maria Boile, Konstantinos Rikkou, Sotiris Theoianis, Christos Georgakopoulos, Georgios Voulkas, Petros Pallis, Theodora Todi and Georgios Iliadis

33. *Singular Spectrum Analysis – Hybrid Forecasting Methods with Application to Air Transport Demand.*
Kingsley Adjenughwure, Victor Balopoulos and George Botzoris

9:00 – 13:00  **Parallel Poster Session C**

Afroditi Stamoulou, Kostas Konstantinou and Irene Tsakiridou

7. *Fuzzy theory application for the improvement of Optimum Route algorithms.*
Konstantinos Mattas, George Botzoris and Basil Papadopoulos

9. *Factors affecting professional drivers’ response to Variable Message Signs.*
Maria Poulopoulou and Ioanna Spyropoulou

15. *Viability of investments for the development of an electric vehicle charging network in Greece.*
Nikiforos Plytas, Dimitris Margaritis and Maria Boile

Lambros Mitropoulos and Panos Prevedouros

Eliza Gagatsi, Elli Papakosma, Annie Kortsari and Elpida Xenou
20. Validation of Everscape, the Evacuation Simulator.
Emmanouil Chaniotakis

Alexandros Deloukas

29. Transportation-related climate change adaptation measures.
Iraklis Stamos, Evangelos Mitsakis and Josep-Maria Salanova

39. Road Safety Training through a Master Course in Belarus.
Stergios Mavromatis, Alexandra Laiou, George Yannis, Jo Barnes, Gabriele Giustiniani and Luca Persia

42. Integrated Urban and Transport Planning in Touristic Areas towards Sustainable Mobility: The case of Rethymno, Crete.
Konstantinos Athanasopoulos and Thanos Vlastos

43. Systematic Data Collection from Social Media for Transportation Research.
Emmanouil Chaniotakis, Constantinos Antoniou and Evangelos Mitsakis

48. Complex Network Analysis on Transportation Networks.
Emmanouil Chaniotakis, Evangelos Mitsakis, Josep Maria Salanova Grau and Iraklis Stamos

13:30 – 18:00
Parallel Poster Session D

50. Modelling intermodal freight flows with combined use of Transtools and Cube Cargo. Case study: freight transport in the logistics chains crossing the Adriatic Sea.
Fani Hatziioannidou

51. Sustainable student mobility in the city of Serres.
Panagiota Papadopoulou, Foteini Mikiki and Eleftherios Panagiotopoulos

Haris Perakis, Thanassis Mpimis, Chis Danezis, Vassilis Gikas and Constantinos Antoniou

Spyros Vrigias, Katerina Chrysostomou, Georgia Aifantopoulou and Anastasios Tsakalidis

Maria Chatziathanasiou, Annie Kortsari and Yannis Tyrinopoulos

60. Integrating city logistics into urban mobility policies.
Maria Morfoulaki, Foteini Mikiki, Kornilia Maria Kotoula and Glykeria Myrovali

61. Towards a modern estimate of “value to prevent a fatality” for road crashes in Greece.
Konstantinos Kostovasilis and Constantinos Antoniou

Aggelos Gkiokas, Dimitra Katsampi, Eleni Vlahogianni, Konstantinos Kepaptsoglou and Matthew Karlaftis

64. Investigation of issues for improving energy consumption and environmental impacts in rail freight transport.
Athanasios Ballis, Tatiana Moschovou and Eleni Tournaki

70. Assisting Transit Operators in Designing Sustainable Bus Route Networks.
Yannis Tyrinopoulos, Moschoula Pternea, Konstantinos Kepaptsoglou, Dimitrios Kosmopoulos, Markos Papageorgiou and Ioannis Papamichail

74. Development of a National City Network for Sustainable Urban Mobility Plans: Problems and perspectives.
Ioannis Politis, Panagiota Papaioannou and Anastasias Nikolaidou

76. How does socio-economic status affect the use of CRS and seat belts? Preliminary results from a study in Athens.
Ioanna Armouti, Constantinos Antoniou and George Yannis

77. Critical changes in road safety during economic recession. A comparison between Greece and the USA.
Alexandros Skampardonis and Pantelis Kopelias

82. The iRAP standardized protocols as a tool for infrastructure road safety inspections: the NR6 I/C Velestino (A1) - Volos road section example.
Evangelos Bellos, Stelios Efstatiadis and Steve Lawson
ABSTRACTS
THURSDAY, 5th of NOVEMBER 2015

SESSiON A: URBAN MOBILITY: THEORY & APPLICATIONS
Chair: A. Stathopoulos - C. Pirgidis

3. ALTERNATIVE - COLLECTIVE PATTERNS OF OWNERSHIP AND USE OF PASSENGER CARS IN THE CITY.

Ioanna Palanta 1, Christos Taxiltaris 1

1 Department of Surveying Engineering, Aristotle University of Thessaloniki
E-mail: ipalanta@topo.auth.gr, chtaxilt@auth.gr

Abstract

The current structure of urban transport systems has a general aftermath in the environment and quality of life. However, the aim today is to meet society's desires and needs, by promoting other more environmental friendly means of transport. This paper proposes the creation of a carsharing system in Thessaloniki in order to improve and integrate the offered mobility services. Carsharing is defined as a system that allows each co-owner/subscriber to use a vehicle for the course and scope of his choice. This approach does not rely on the ownership, but it is interested in efficient use. The planning process follows a dual level approach: creating a bottom-up system that enhances the mobility in neighborhood level and creating a municipal organization to support urban mobility. These two proposals can operate independently but also complementary. Advantages are comparatively low cost, flexibility, short time implementation, and contribution in CO2 emissions reduction.

Keywords: urban transport, carsharing, sustainable mobility.

31. TRAFFIC CALMING MEASURES: USERS’ LEVEL OF ACCEPTANCE DEVELOPMENT THROUGH TIME

Panagiotis Iordanopoulos 1, Katerina Chrysostomou 1, Evangelos Mitsakis 1

1 Center for Research and Technology Hellas (CERTH) / Hellenic Institute of Transport (HIT)
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Abstract

Traffic calming approach, whose primary objective is to alleviate the negative impacts of traffic in the urban environment, is nowadays increasingly utilized in urban spatial planning. One of the most important factors that could affect not only the decisions made by policy makers but also the final design and level of introduction of various traffic calming measures within urban limits, is the acceptance of such kind of measures by the users. This paper presents the temporal development of road users’ acceptance and the change of their travel behaviour through the evaluation of a set of traffic calming measures, implemented in order to reduce vehicle speeds and enhance road safety. The results, expressed in terms of different levels of users’ acceptance, reveal the temporal adaptation of road users' travel behaviour as well as the temporal alteration of their perspective regarding the benefits of such kind of measures.

Keywords: Users’ acceptance; traffic calming; evaluation.
10. EVALUATION METHODOLOGY FOR BIKEWAYS CHARACTERISTICS IN A MID-SIZE CITY IN GREECE

Athanasios Galanis 1, Pantelis Kopelias 1, Evagelos Bourazanis 1, Ioannis Kaltsas 1, Nikolaos Eliou 1

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Abstract

This study presents a methodology of examination and evaluation of existing bikeway infrastructure. In the first part of the study, is conducted a literature review regarding issues of bicyclists' transport characteristics, bicyclists' road safety and methodologies evaluating the bicyclists' urban road environment. In the second part of the study, is presented a methodology evaluating the existing bikeway network in the city of Karditsa, Greece. The methodology is based on the implementation of an audit tool of two checklists, one for the road segments and one for the crosswalks. Finally, is presented the conclusions of our study and proposals for remedial actions of the bikeway network and road environment in the framework of sustainability.

Keywords: Bikeway, audit tool, road environment, sustainability.

57. IMPACTS OF THE ECONOMIC CRISIS ON MODAL CHOICE AND TRIP FREQUENCY OF URBAN TRANSPORT SYSTEM

Apostolos Papagiannakis 1, Giannis Baraklianos 2, Alexia Spyridonidou 3

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2 Laboratoire d’Economie des Transports, Université Lumière Lyon
3 Board of European Students of Technology, Thessaloniki

Abstract

This article investigates the type and quality of the changes in the mobility behavior that are caused by radical economic and social changes. It is internationally acknowledged that during the period of an economic crises significant changes can be observed both in car traffic volume, modal split and the mobility habits of citizens. Within the review of the literature, the cases of Iceland, Spain, Poland, Cuba and the US are compared with the Greek paradigm. It also presents the main results of a trip survey conducted on a representative sample of 853 residents of the agglomeration of Thessaloniki, in order to compare the characteristics of the trips bound for the city center, before and after the crisis began. From the results of research in several countries we conclude that the private car is the first transport mode affected by the crisis. In particular, residents of Thessaloniki have reduced the frequency of their trips by private car, with greater reductions observed in trips for shopping and entertainment. Finally a modal shift is observed towards public transport and soft modes but it is not documented that changes in mobility behavior will have permanence and durability.

Keywords: Economic crisis, urban mobility, modal choice, trip purpose, trip frequency, Thessaloniki.

54. ATTitudinal SURVEY FOR THE URBAN MARITIME TRANSPORT IN THE CITY OF THESSALONIKI, GREECE

Alexandros Dolianitis 1, Socrates Basbas 2, Magda Pitsiava-Latinopoulou 1, George Mintsis 2, Ioannis Politis 1

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2 Department of Rural & Surveying Engineering, Aristotle University of Thessaloniki
Email: rmasmpa@auth.gr, gmintsis@auth.gr

Abstract

The objective of the present paper is the investigation of the level of acceptance that an urban maritime
transport mode would have in the Greater Area of the city of Thessaloniki. More specifically, an attempt was made to investigate the preferences of residents and visitors through a research which took place in the areas of the two terminal stations, namely the near area of the Port of Thessaloniki and the residential area of Peraia. The stated preference survey was conducted during the period July – August 2014 and a number of 130 questionnaires were collected and analysed. It is estimated that the results of the analysis will be useful in the process of introduction of such a mode in the urban transport network of the city.

**Keywords:** Urban Maritime Transport, Attitudinal Survey

### SESSION B: ISSUES IN TRANSPORT POLICY AND ECONOMICS

Chair: E. Sambracos – I. Golias

34. **THE FUTURE OF TRANSPORT IN EUROPE: ADDRESSING THE CHALLENGES**

Maria Boile 1, Aggelos Aggelakakis 1, Anestis Papanikolaou 1, Alkiviadis Tromaras 1

1 Center for Research and Technology Hellas (CERTH)/Hellenic Institute of Transport (HIT)

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**Abstract**

The transport sector constitutes one of the main pillars supporting the European economy. The quality and efficiency of transport services are directly related to economic growth, competitiveness and overall quality of life. Meanwhile, investments in the transport sector require long periods of time to deliver any benefits thus making necessary the exploration of the conditions under which the transport sector will evolve (financial, geopolitical, natural environment) within a future timeframe. The current paper sets 2050 as a target year and presents the challenges that the EU transport sector will face through a spectrum of three alternative future scenarios. The paper presents data which are based on the results and conclusions of the European funded Research Project "FUTRE - FUture prospects on TRansport evolution and innovation challenges for the competitiveness of Europe" that was concluded in September 2014.

**Keywords:** Future transport demand scenarios, passenger transport, freight transport, innovation, challenges and prospects, future of EU transport, European transport policy

66. **INVESTIGATION OF APPLICATION OF THE “VALUE CAPTURE” METHOD FOR FINANCING THE THESSALONIKI METRO: THE CASE OF ENTERPRISES**

Andreas Nikiforiadis 1, Anastasia Roukouni 1, Socrates Basbas 1, George Mintsis 1, Christos Taxiltaris 1

1 Department of Surveying Engineering, Aristotle University of Thessaloniki

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**Abstract**

In the framework of the present paper the implementation of the “Value Capture” method is investigated with respect to the Thessaloniki metro. The basic idea of the method has to do with the recovery by the public sector of part of the additional value resulted from the improvement of the accessibility level for residents and sole traders in order to finance a project. The research focuses to the investigation of views of the sole traders in the area of ten under construction metro stations. A questionnaire-based survey took place during the period October – November 2014. A number of 120 questionnaires were collected (12 questionnaires for each station) which are then analyzed in order to investigate the extent and conditions for the possible acceptance of the specific procedure.

**Keywords:** Value capture, metro, financing.
80. PEAK CAR EFFECTS ON SCHEME APPRAISAL

Christina Spiliopoulou 1, Constantinos Antoniou 2

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Abstract

The phenomenon of peak car is based on the analysis of a series of indicators related to car use and travel behaviour. It implies that the use of car, that has been increasing since its first appearance, will either drop or increase at a decreased rate. Should peak car occur in the future, it will affect our current forecasting. This study focuses on the impact that peak car would have on scheme appraisal, focusing on economic impacts. It focuses on the example of an 80km section of the A12 that forms part of the strategic road network f the U.K. The official scheme appraisal guidelines and best practice methods followed in the U.K. have been used and combined with a methodology that assesses the economic impact of inaccuracies in traffic forecasting. The results of this study reveal a significant additional cost if the current forecasting is proven to be wrong.

Keywords: peak car, traffic forecasting, scheme appraisal

45. A MULTIVARIATE PROBIT MODEL FOR ANALYZING TRAVELERS’ CHOICE OF AIRLINE CARRIER

Christina P. Milioti 1, Matthew G. Karlaftis† 1, Eleni Akkogiounoglou 1

1 Department of Transportation Planning and Engineering, School of Civil Engineering, National Technical University of Athens
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Abstract

We investigate the factors that affect passenger decisions regarding airline choice. Three Multivariate Probit (MP) models are developed to analyze data for a sample of 853 respondents. This methodology allows for modeling the simultaneous, yet separate, consideration of airline choice determinants. Fare, safety and reliability, and friendly-and-helpful staff during flight are the most important determinants of airline choice. In-flight entertainment and frequent flyer program are considered to be less important. Results clearly depict differences in the significance of these factors among passengers with different socio-demographic and trip characteristics.

Keywords: multivariate probit model; airline choice; fare, safety and reliability, trip characteristics.

81. HIGHWAY INFRASTRUCTURE INVESTMENT AND ECONOMIC GROWTH AT THE MSA LEVEL; ACCOUNTING FOR SPILLOVER EFFECTS

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Abstract

Past research has reached inconsistent conclusions regarding the magnitude of the effect of transportation investment on economic output, mainly due to different levels of geographic disaggregation which in some cases did not allow for unobserved heterogeneity to be captured by the model specifications. Using panel data at the MSA level for 1980-2008 for U.S., we estimate Gross Regional Product (GRP) elasticities of highway transportation investment using Cobb-Douglas and transcendental logarithmic production functions, to allow for comparison across different functional forms. The level of geographic and the transportation
infrastructure’s inherent network characteristics suggest the presence of spillover effects among neighboring MSAs. Using MSA and non-MSA levels of the variables of interest, we revisit the model specifications by testing for and accounting for the presence of spillover effects among neighboring MSAs. The estimation results support the hypothesis of economic interaction between neighboring areas, through productivity leakages and migration of production factors.

**Keywords:** spillover effects, Cobb-Douglas, transcendental logarithmic, productivity leakages, economic output.

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**PARALLEL POSTER SESSION A: RESEARCH THERSES**

**11. A MODEL FOR THE SUPPLY VEHICLE ROUTING PROBLEM WITH ROUTE TIME BALANCING**

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**Abstract**

Transportation and distribution of goods is of primary importance to the supply chain, as it corresponds to a significant part of a company’s operating costs. We develop an extension of the vehicle routing problem with capacity and time window constraints, pickups and deliveries, in which route duration balancing is considered. A genetic algorithm is proposed for solving the model. The model and algorithm are implemented to a small scale test problem. Results indicate robustness of the solution approach and the impact of capacity to the design of routes and route time balancing.

**Keywords:** Vehicle routing problem, genetic algorithm, route time balancing

**12. REGIONAL RAIL CONNECTION BETWEEN THESSALONIKI AND LARISSA. EVALUATION OF THE CURRENT SITUATION AND PROPOSALS FOR THE IMPROVEMENT OF THE LEVEL OF SERVICE PROVIDED.**

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**Abstract**

In this study, the current situation of Thessaloniki - Larissa regional railway is analyzed as well as evaluated. The possibilities for the improvement of this specific railway connection’s level of service are also examined. Moreover, data about the railway infrastructure, the rolling stock and the operation of Thessaloniki - Larissa regional railway are presented in order to analyze its current situation (data from October 2014). The basic methodological “tools” of the study are: a) a research based on questionnaires and in situ measurements which were done in order to analyze the characteristics of movements and to write down the points of view of railway users about the level of service provided as well as their suggestions for further improvements and b) the verification of the applicability of Thessaloniki – Larissa railway connection with suburban – regional service features using existing infrastructure that is based on international standards. It should be noted that the basic requirements that must be satisfied first before choosing the suburban - regional railway are referred too. Furthermore, the track capacity, the daily ridership and the average occupancy of regional trains are calculated. In addition, the regional rail’s level of service provided is compared with the level of service of intercity buses and private cars. The results of the applicability verification in combination with the findings of the research based on questionnaires permitted the drawing of conclusions about the operation of Thessaloniki – Larissa regional railway and the formulation of suggestions for the improvement of the level of service that is provided.

**Keywords:** suburban railway, regional railway, Thessaloniki – Larissa railway line, level of service.
13. Catenary Free Power Supply Systems for Tramways - Comparative Assessment

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Abstract

This paper deals with the catenary free power supply systems for tramways and more specifically the ground power systems and the energy storage devices. Those power supply systems are considered as cutting edge technologies for railways and can be used instead of the overhead catenary systems.

The objectives of this paper are the following:

• The recording of the basic structural and functional features of each and every catenary free system and the identification of the research and testing stage in which each system currently is, the main advantages and disadvantages, the prospects of further investigation and the description of various examples from cities where these technologies are being used.

• The evaluation of the construction, operation and maintenance costs of the systems according to statistics.

• A comparison between the overhead catenary system and the alternative catenary free technologies to determine the most advantageous solution.

The problems of heavy congestion in many cities and the air pollution led the relevant transport authorities in the quest of transport systems more environmentally friendly than buses and private cars. The environmentally friendly nature of the tram due to the electrification, the dynamic design that provide comfort to passengers, easy accessibility because of their surface and integration of low-floor vehicles and the small travel times allowing, have established it as a reliable means of transport among the citizens.

One of the main tram’s disadvantages are the visual disturbance caused to the inhabitants by the presence of overhead wires of electric system, (Overhead Catenary System- OCS) which is currently in use in the vast majority of tramway networks. For this reason, in recent years there is a strong tendency to limit the visual impact caused by the presence of overhead power cable tram with the investigation of alternative power systems such as the energy storage systems and ground supply systems.

Keywords: energy supply for tramways, ground supply systems, energy storage devices


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Abstract

The aim of this paper is to reveal the significant factors that describe motorcyclists’ movement during overtaking. Powered Two Wheelers (PTW) trajectory data was obtained using video recordings from Mesogion Avenue, a major urban arterial in Athens, Greece. Moreover, Structural Equation Models were used to assess the effect of various variables on PTW overtaking. Results show that the PTW driver is significantly influenced by the available area he/she has for maneuvering, the distance from the lead vehicle and the distance from the vehicle behind the subject PTW.

Keywords: Powered Two Wheelers (PTW), influence, overtaking, trajectory, motorcyclist, Structural Equation Models (SEM).
17. EVALUATION OF CONGESTION PRICING POLICIES ON URBAN ROAD NETWORK’S TRAFFIC

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Abstract

Traffic congestion in the Athens road network is a major problem that affects its urban environment and its residents’ quality of life. Limiting car usage by applying a congestion pricing measure, is one of the most widespread approaches to reduce traffic in large metropolitan areas. This paper presents the main findings from a study of the effects of congestion pricing approaches on traffic in the inner ring of Athens. Four different scenarios are considered, using the results of a survey on the willingness to pay for reducing congestion. The scenarios are evaluated using Aimsun traffic simulation software, through the analysis of traffic outcomes of each congestion pricing static traffic assignment scenario.

Keywords: urban road networks, traffic management, congestion pricing, willingness to pay, traffic simulation

21. THE INVESTIGATION OF EXOGENOUS INFLUENCES ON PUBLIC TRANSPORT PERFORMANCE

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Abstract

Accomplishment of strategic goals in public transport systems depends on both the management practices followed by the respective agencies and the exogenous influences on their operations. Exogenous influences are defined by factors that cannot be altered by agencies’ actions, such as the characteristics of the local geography, population, economic activity and road infrastructure within the area of delivered public transport services. This paper attempts to explain the assessment methods used and the content of exogenous influences on public transport performance composing the hitherto findings of the respective studies. It also highlights the weaknesses of the existing methodological approaches and suggests directions for a more integrated and reliable consideration of the subject.

Keywords: Public transport; Performance; Operational environment; Exogenous factors; Regression analysis; DEA; Literature review.

25. SOFT MOBILITY SCENARIOS FOR A SUSTAINABLE CITY

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Abstract

The paper focuses on the variation of travel time and volume after any change in traffic network components. Changes in the transport capacity held within the framework of a worth-living city, which sets out the contribution
of promoting soft mobility measures in order to develop a safer urban road transport environment. The study area is Eastern Thessaloniki, in Greece. The current situation in the road network is imprinting upon the baseline scenario and two possible scenarios are considered. The first scenario introduces bus and bike lanes in main roads of the network, whereas the second scenario involves the implementation of speed control measures. The importance of traffic calming measures is determined, in light of sustainable mobility, as well as the criteria for selecting the roads in which they should be implemented. In the practical part, there is a comparative presentation of the results of the scenarios in VISUM software. Finally, conclusions arising from the investigation and proposals of the research are presented.

**Keywords:** Traffic calming measures, urban road safety, Eastern Thessaloniki road network, VISUM software, bus and bike lane plan in Eastern Thessaloniki, sustainable mobility, four-step transportation forecasting model

27. COMPARATIVE ASSESSMENT OF ROAD INFRASTRUCTURE SUSTAINABILITY RATING SYSTEMS

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**Abstract**

The concept of sustainability became an integral part of the civil engineering projects both in design and construction. In the present paper, an analysis of nine sustainability rating systems (GreenRoadsTM, GreenLITES, ENVISIONTM, INVEST 1.0, INVEST ©, I-LASTTM, BE2ST IN HIGHWAYS, IS and CEEQUAL) is attempted. The analysis focuses both on an examination of their structure and function and a comparative assessment between them. Tables and graphs were conducted in order to analyze the data, which included the rates of criteria categories for each rating system. The achievement of both effective comparisons of the systems and considerably reliable conclusions was based on the determination of seven common categories of criteria, namely Ecology and Biodiversity, Quality & Water Management, Energy, Materials, Noise Pollution, Air Pollutant Emissions, Man and Landscape. The participation rate of the criteria was calculated concluding to the final result, as well as some statistical figures.

**Keywords:** Sustainability, Rating systems, Road Infrastructure, Comparative assessment

36. GAME-THEORETICAL INVESTIGATION OF SUPPLY AND DEMAND IN AVIATION MARKETS

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**Abstract**

This paper presents a structural model which incorporates a travel demand model and an airline behavior model. Demand is modeled through a nested logit model. Airline behavior is modeled assuming that, within an oligopoly market, airlines set ticket prices so as to maximize their profits. A simultaneous airline game is constructed so as to obtain the Nash equilibrium ticket prices. The structural model suffers from endogeneity and thus is estimated by the Generalized Method of Moments using appropriate instrumental variables. Data on domestic flights within United States during the first quarter of 2012 were used to estimate the model.

**Keywords:** Demand model, Nash equilibrium, Generalized Method of Moments, Instrumental variables.
37. OPTIMAL DETOUR CHOICE IN AN URBAN FREEWAY

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Abstract

This paper proposes an integrated method for evaluating all alternative detours (of an urban motorway) that can be used for channeling traffic in major incidents and unexpected events. The evaluation method chosen is multicriteria analysis and the basic categories analyzed are safety, cost of and environmental impacts. Each category is broken down into subcategories and each subcategory is calculated and calibrated using a different measurement scale. The study is carried out for three different scenarios: Maximum traffic (peak hour) with no improvements in the detour route, maximum traffic with best improvements (support by traffic police) and minimum traffic (low volume periods). After the implementation of the multicriteria analysis, a final grade of “overall efficiency” is obtained for every route and for each scenario. The research results include the overall ranking of the routes as well as some critical conclusions about the preparation and the implementation of such a scheme.

Keywords: traffic incident, rerouting, urban motorway, multicriteria analysis

38. EFFECT OF VEHICLE COLLISION TYPE ON ROAD ACCIDENT SEVERITY IN GREECE

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Abstract

The present research aims to investigate the effect of vehicle collision type on road accident severity in Greece. For the achievement of this objective, appropriately processed data for the period 2007-2011 in Greece were used from the road accident database of the EI. STAT. authority and the log-rate analysis models were developed. Severity has been chosen to be expressed as the rate of number of persons killed and seriously injured divided by the number of slightly injured persons. The analysis led to the investigation of the impact of the chosen parameters, which are region type, vehicle type involved, on accident severity. It appears that the severity is higher for the passengers of passenger cars and motorcycles, while the vehicle type of the opponent car that affects more the severity is passenger car and truck. This impact is higher outside urban areas.

Keywords: Road accident, Road safety, Accident Severity, Vehicle Collision type, Log-rate analysis
PARALLEL POSTER SESSION B: RESEARCH THESES

40. APPLICATIONS OF LASER SCANNING TECHNOLOGIES IN TRANSPORT OPERATIONS

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Abstract

The pavement, as time passes and under the effect of traffic and climatic conditions, loses its original state during its lifecycle. In case that no action is taken for its preservation, it degrades in the level of its Present Serviceability Index. In this research the development of a methodology which will allow the creation of an objective diachronic database is developed. It will contain elements of the present state of functionality of a country’s national road network. The methodology is focused on the Terrestrial Laser Scanners (TLS). The analysis includes three road sections of different functional state. Special care was given to the appearance of aquaplaning. More measurements were implemented in NTUA campus, for the recording of an accident scene using a TLS and a DSLR camera. The processing leads to the evaluation of the accuracy of each method. The results highlight the methodology Structure-from-Motion as the ideal solution for quick and sufficiently accurate capturing.

Keywords: Scanning, terrestrial, laser, pavement, functionality, DSLR camera, accident, database, Structure-from-Motion.

44. EVALUATION OF ROADSIDE WRONG-WAY WARNING SYSTEMS WITH DIFFERENT TYPES OF SENSORS

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Abstract

Driving the wrong way on motorways has been a nagging traffic safety problem all over the world. In order to reduce wrong-way driving incidents and crashes, roadside wrong-way warning systems applying advanced ITS technologies have been adopted and deployed for the first time at 24 rest areas on motorways in Japan since 2008. The systems are used to detect wrong-way vehicles and warn the drivers of their wrong-way driving at the off-ramps to the rest areas. This paper describes an evaluation of the roadside wrong-way warning systems with four different types of sensors from the viewpoint of detection accuracy and effectiveness in preventing wrong-way driving. The sensing technology includes microwave Doppler radar, ultrasonic sensor, photoelectric sensor, and video image processing technology.

Keywords: Wrong-way driving, wrong-way crash, wrong-way warning system, safety, motorway.
46. **COMPARISON OF MACROSCOPIC AND MICROSCOPIC EMISSION ESTIMATION APPROACHES IN THE EVALUATION OF ITS**

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**Abstract**

The present paper presents and analyzes different emission estimation approaches that can be used in the estimation of traffic-induced emissions and explores the potential of these approaches to be used for assessing the environmental effectiveness of Intelligent Transport Systems (ITS) and the measures they introduce. For this purpose, two emission estimation approaches are used, a macroscopic and microscopic one, aiming at evaluating the effect of a Cooperative ITS (C-ITS), as well as a signal timing adjustment measure. The results show that the macroscopic model can partially quantify the effect in traffic-induced CO2 emissions brought about by the signal timing adjustment, while it cannot properly assess the environmental effectiveness of the cooperative system.

**Keywords:** Intelligent Transport Systems, Emission models, Environmental evaluation

47. **INFLUENCING FACTORS OF PEDESTRIAN VELOCITY UNDER CONSTRAINTS**

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**Abstract**

The changes of the transport conditions during the recent years are significant. Cities are enlarged and the movements of their citizens are more complex (especially due to higher densities). A result of this is the increase of emergency situations (situations when an area has to be evacuated in a short time period). This study is an effort analysis of the basic transport magnitudes of pedestrian movement, in order to be used for pedestrian evacuation. The primary aim is to investigate the factors that affect pedestrian movements. Based on the literature review we cluster the factors and we examine the influence of one cluster. Through different scenarios the impacts of each factor in the cluster in pedestrian behavior and movement are measured. The results of the simulations evince the impacts of the factors. Finally the constraints of the simulations and the way that affect the results are described.

**Keywords:** Pedestrians, simulation, volume, average velocity

49. **DEVELOPING A SUSTAINABLE MOBILITY PLAN IN PIRAEUS WITH SPECIAL EMPHASIS ON CYCLING.**

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**Abstract**

Sustainable mobility planning is an emerging planning concept, largely applied in European and American
cities during the last two decades, as a means to achieve more efficient and sustainable cities regarding the ceasing of the major threats to urban environment, namely: climate change, accidents, traffic saturation, air and noise pollution, car dependency and domination in the public space. Municipality of Piraeus is a developing autonomous commercial and business center, characterized by high density housing, narrow street geometric characteristics and the port presence. Aim of this paper is to present its recent Sustainable Mobility Plan by putting special emphasis on the strategic plan for a cycling network. The key principles of its methodological development are demonstrated along with the strategic enhancement of walking and multimodal transport services. The main objective is to integrate cycling in mobility policies applied by the described plan in Piraeus.

Keywords: sustainable mobility plan, Piraeus, bicycle planning, walkability

67. GPS DATA COLLECTION FOR ACTIVE TRANSPORT MODES AND DESIGN OF REAL LIFE EXPERIMENTS

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Abstract

In the context of a research project studying the implementation of active transportation, especially electric bicycles replacing motorized modes such as motorbikes both in short, urban routes and in long rural leisure trips, we study the performance of GPS devices as direct source of information. The information from GPS is used to develop a methodology for data collection and for designing SP experiments utilizing real-life data for the scenarios. This is particularly important for this study region, which is an island area suffering from extensive motorcycle use and teenagers’ safety is at stake. Replacing a portion of motorcycle fleet with regular or electric bikes as well as with walking for short distances can lead to environmental, traffic safety and quality of life improvements.

In this paper a literature review of using GPS devices in travel surveys is presented. Then, a methodology for the full use of the information of the GPS devices is provided. The data collection involved, uses the GPS traces to extract information regarding speed, travel time, route choice, street slopes and altitude that can be used to evaluate route choice especially when considering alternative active transport modes, including walking, regular and electric bicycles. The data used is collected in the island of Chios, Greece and is used to locate, select and evaluate 4 different routes in the study area. These routes are evaluated for their potential as a choice in active transport. A comparison for different mode characteristics such as speed, travel time, maximum speed for each route and a comparison for different route characteristics such as distance and slope takes place in the second part of the research. Data from GIS software is used to demonstrate the routes in their surrounding land use context, with demographic data, constructing a framework that uses mode characteristics, route characteristics and GIS data to evaluate if a route is attractive for active transport.

Keywords: Bicycle, Pedestrian, Active Transport, Data Collection, GPS, Bicycle Route Choice, Bicycle Route Characteristics, Design Of SP Experiments
68. RHYTHMS IN URBAN AND ISLAND AREAS: DOES LIFESTYLE AFFECT DAILY DYNAMICS?

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Abstract

This paper compares daily activity and travel choices of individuals living in Athens, Greece and Chios, the fifth largest Greek island. Harmonized data from a travel diary from Athens and an activity diary from Chios are used in this paper. Analysis conducted includes the comparison patterns of trip chains, tour structure mode choice, and timing of departure and arrival at home in a day in the two areas. The results highlight the differences and commonalities between the urban and island contexts, signify the effect of lifestyle on daily activity and travel choices, and reveal that the more relaxed lifestyle of the island area can lead to later morning departure times, non-influenced by the amount of work an individual has to conduct and in a more independent organization of everyday life, not bound by the constraints of an urban physical environment. In addition, in the urban area people prefer to conduct a secondary tour through the day for their secondary activities, while, in the island case people prefer to make an intermediate stop on their way to or from their primary activity. Moreover, walking takes up a much larger share in modal split in the island area. In both environments leisure activities are associated with walking, but the proportion for the islanders is even larger.

Keywords: daily dynamics; rhythms; lifestyle; time-allocation; urban and island area comparison

71. DEVELOPMENT OF A METHODOLOGICAL FRAMEWORK FOR PREDICTING CONTAINERS’ DWELL TIME IN MARINE CONTAINER TERMINALS - FIRST RESULTS

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Abstract

The general aim of this paper is to propose the development of a methodological framework that incorporates the various factors affecting the Dwell Time (DT) of containers in container terminals. Container terminals are regarded as a key element of logistics chains since they are a link between sea and the hinterland transportation modes. Workload forecasting is essential when it comes to truck arrivals for the avoidance of bottlenecks and the smooth integration of container terminals in the supply chain. Up to now, various policies have been implemented to control and to predict DT but with contradicting results. The suggested methodology will require the combination of aggregate and disaggregate models to predict DT. The first results from the aggregate model analysis are presented. The developments of such predictive tools are expected to enhance decision and policy making at a terminal, supply chain and national level.

Keywords: import container, Dwell Time, aggregate data, disaggregate data, decision making.
72. TRAVEL BEHAVIOUR CHANGE VIA SOCIAL MARKETING INTERVENTIONS

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Abstract

Achieving sustainable travel behaviour calls for a psychology and marketing approach. Appropriate attitudinal segmentation of a target audience enables focusing on attitudes that may lead to travel behaviour change. The Theory of Planned Behaviour provides a sound theoretical background for well-conceived interventions to be based on the insights of social psychology and social marketing. In this framework, a novel research was undertaken in the city of Thessaloniki, Greece. A travellers’ typology was extracted and provided the pool of participants for an intervention scheme fed by detailed literature review, using social marketing techniques. The adopted experimental design dealt with 37 participants (intervention and control groups), using pre and post measurement. Findings suggest the intervention’s efficiency on problem awareness, sustainable means use and physical activity uptake. This research advocates the need for an interdisciplinary approach in travel behaviour research and to enrich with social marketing elements the field of sustainable mobility promotion.

Keywords: Travel Behaviour Change Interventions; Theory of Planned Behaviour; Social Marketing; Sustainability

73. ANALYSIS OF PREFERENCES FOR THE USE OF A BICYCLING SHARING SYSTEM IN ATHENS

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Abstract

The objective of the present research is the analysis of the characteristics influencing the use of a bicycle sharing system in Athens. The necessary data were collected through an on-line survey to a sufficient sample of commuters and residents of the Municipality of Athens and the stated preference method was used for various scenarios of cost, time and comfort. A logistic regression mathematical model was developed describing travellers' behaviour based on the characteristics of the travellers and their journeys. Both multinomial and mixed logit models were developed. From this analysis it was derived that the probability for a traveller using bicycle instead of passenger car or public transport depends on travel time, cost and comfort level, along with the age and the gender of the traveller.

Key words: Bicycle sharing systems, stated preference survey, multinomial logit model, mixed logit model
SESSION C: RESEARCH AND APPLICATIONS IN ROAD SAFETY
Chair: G. Yannis – V. Halkias


Ilias Keppas 1, Yannis Tyrinopoulos 1

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Abstract

This paper aims at investigating the intention of greek companies and organizations throughout the entire transportation system regarding the future adoption and implementation of an effective Road Traffic Safety Management System in conformance with the applicable requirements set within the new relevant international standard ISO 39001:2012. The paper also provides the experiences of the few greek companies already certified according to this standard. The ultimate goal of the standard is to reduce the deaths and severe injuries caused by the road traffic accidents due to business activities of these companies and the way these activities interact with the road traffic system. Conclusions drawn by the analysis of the questions addressed to the various companies also led to specific recommendations for the future investigation of issues and factors related to road traffic safety performance improvement, which must be demonstrated by all interested parties and social partners.

Keywords: Road safety, International Standard ISO 39001: 2012, Certified companies research

5. METHODOLOGY FOR THE ANALYSIS OF THE INTERURBAN ROAD NETWORK IN THE CONTEXT OF INTEGRATED SEISMIC RISK MANAGEMENT

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Abstract

The road network services mobility needs generated by the poles of socio-economic activity. Therefore, it is considered crucial to analyse its functioning under extreme events, such as an earthquake. An earthquake may cause damage to bridges, tunnels, embankments and trenches and, thus, decrease the capacity of specific segments affecting the wider road network. The current project involves the proposal of a methodology for the analysis of the interurban road network in order to evaluate the differentiation of sustainable mobility factors, trip assignment and economic costs due to congestion in the period immediately after the earthquake and in the period of gradual recovery from the earthquake in relation to the pre-earthquake period. The proposed methodology is based on the results from the implementation of the first phase of an on-going research project for the development of a software program for the assessment of seismic risk along the interurban road network.

Keywords: Interurban road network, seismic risk, forecast, analysis, evaluation, sustainability, trip assignment, congestion cost.
16. PILOT IMPLEMENTATION OF ECALL SYSTEM IN GREECE

George Patsiavos 1, Sofia Papatheasopoulopou 1, Panagiotis Papaspiropoulos 1, Dimitris Margaritis 2, Alexander Stathacopoulos 2, Evangelia Portouli 3, Aikaterini Pagle 3

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Abstract

In the framework of the pilot implementation of the eCall system in Greece, about 1700 test calls have been made in various positions of the urban and inter-urban road network in the region of Attica and Thessaloniki within six months. In the first test phase the success rate of the eCall calls, when connecting to a local telephone number, was estimated to 62.3%. The success rate of established voice communication was 88.0% for Athens and 87.3% for Thessaloniki on average, quite close to the EU Average (93%). In the second phase, where eCall Flag was used, a slight improvement was observed to the system response, more specifically to the establishment of the call, the voice blocking period during the transmission of MSD packet and the time in which the MSD information was displayed on the operator monitor.

Keywords: eCall, road accidents, PSAP, in-vehicle system, victim rescue.

23. INVESTIGATION OF MOTORCYCLE RIDERS’ BEHAVIOR ON RURAL ROADS’ JUNCTIONS

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Abstract

The objective of the present paper is to contribute to the enquiry of the effect of road accesses to roadside land uses in motorcycle drivers’ behavior. Within the context of the research, field measurements were conducted, with the participation of eight riders and the use of proper equipment that records velocities. These measurements were conducted taking into account various factors which might influence riders’ behavior, such as the difference on the experience level, the presence of pillion and the different aspects of access, such as the presence of signage, the roadside land use, the location of access and the geometric characteristics. The research showed that speed and traffic offences adjacent to junctions are higher for the experienced riders. It is worth noting that the conclusions resulted are a record of trends in the influence of roadside access to the behavior of riders since the generalization of these trends requires greater statistical sample.

Keywords: riders, motorcycle, velocity, roadside land use, GPS, safety, behavior
28. DEVELOPMENT OF AN EDUCATIONAL SCHEME FOR ROAD SAFETY AUDITORS IN GREECE.

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Abstract

Road Safety Audit (RSA) is one of the actions of the Strategic Plan to improve road safety in Greece 2011-2020 and is considered mandatory for the TransEuropean road Network (TEN-T) according to PD104/2011 regarding safety management of road infrastructure, in accordance to European Directive 2008/96/EC. In the present paper, preliminary results from a project concerning the development of training curriculum and training material for candidate Road Safety Auditors in Greece are presented, aiming to adequately prepare them for conducting RSAs. In particular, the analysis of a questionnaire survey for RSA training and certification practices in European countries and Australia is presented, along with the principles upon which the RSA training program is based. Furthermore, the proposed framework of the curriculum is presented, both for the initial training program and for the follow-up courses of auditors.

Keywords: Road Safety Audit, training curriculum.

79. SPATIAL ROAD SAFETY MODELING LEVERAGING “CROWED-SOURCED” PUBLICLY AVAILABLE GEOGRAPHIC DATA

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Abstract

Safety analysis in service systems –especially in extensive systems involving large populations of users and operators- corresponds to an issue requiring special attention and research. Road service systems stand for a distinguished paradigm of such cases, that users' safety determines the provided level-of-service and are related to decisions made at their design and operational phase. Focusing in the urban conglomerate, where the interrelationships among the users and the infrastructure are more dense and dynamic, the complexity but also the importance of relevant and accurate analysis is increased. The particularities emerging in the urban road systems, like recurrence and accident's risk concentration, combined with spatial development and the correlations among alternative infrastructure features and users behavior, suggest the use of specialized multivariate models of spatial analysis. Here, the Spatial Error Model-ESM is proposed as a suitable method for analyzing crash data and estimating accidents' risk. The use of such methods requires an extensive database, in quality, quantity and variety. Here, the crash dataset is enriched/supported by ‘crowed-sourced', publicly available data, while the demonstrative application correspond to a large-scale urban space (Riyadh, KSA), presenting analytical results that before the current explosion of public data could not be estimated, providing a useful example of leveraging the currently available rich datasets.

Keywords: Spatial Analysis of Urban Space, Spatial Error Model, Crowed-Sourced Data, Road Safety and Road Risk.
6. COMPARISON OF POPULATION EXPOSURE RESULTS AT AIRPORT NOISE ZONES USING DIFFERENT NOISE PREDICTION SOFTWARES (INM, IMM/CADNA) IN THE FRAMEWORK OF THE CORFU STRATEGIC NOISE MAP

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Abstract

In the context of the strategic Noise Mapping of the Municipality of Corfu there is a presentation of the population exposure to noise zones due to aircraft noise by using two different prediction models-methodologies. The models used were INM and CadnaA/IMMI and the noise maps for the indices Lden and Lnight were produced for each model. Afterwards the exposure of population in noise zones of aircraft noise was calculated for each model and finally there was a comparison between the relevant results.

Keywords: Strategic noise mapping, environmental noise, aircraft noise, population, exposure, software, indices, models

32. IMPACT OF LIGHT CONDITIONS ON TRAFFIC FLOW

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Abstract

The objective of this study is to investigate the impact of light conditions on traffic flow. The investigation is focused on through movement at a signal-controlled junction, under fixed-time control and it is based on field measurements which were collected using the pneumatic detector MetroCount 5600, as well as through the observer method and video-recordings. First, data quality control was performed and the position in queue where saturation started was determined. Following this, saturation flow and passenger car units (PCUs) were calculated applying the headway ratio method. Data analysis followed and led to the conclusion that light conditions influence characteristic traffic quantities as higher headways and speed and lower saturation flow and consequently capacity were observed at night. Nevertheless, PCU and saturation start queue position seemed to be unaffected.

Keywords: Light conditions, time headway, saturation flow, passenger car units, pneumatic tubes.


65. ELECTRIC VEHICLES CHARGING INFRASTRUCTURE LOCATION: A GENETIC ALGORITHM APPROACH

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Abstract

As part of the overall goal of carbon emissions reduction, European cities are expected to encourage the electrification of urban transport. In order to prepare themselves to welcome the increased number of electric vehicles circulating in the city networks in the near future, they are expected to deploy networks of public electric vehicle chargers. The Electric Vehicle Charging Infrastructure Location Problem is an optimization problem that can be approached by linear programming, multi-objective optimization and genetic algorithms. In the present research, a genetic algorithm approach is presented. Since data from EV usage are still scarce, OD data of conventional vehicles are used. The algorithm and a user-friendly tool have been developed in R and tested for the city of Thessaloniki. The results indicate that 15 stations are required to cover 80% of the estimated EV charging demand. The results are compared with Efthymiou et al. (2015). The tool is open source and available upon request, and the authors encourage its use by other Municipalities in Greece.

Keywords: Electric Vehicles, Genetic Algorithm, Thessaloniki, Greece.

30. EVALUATION OF POSITIVE & NEGATIVE EFFECTS FROM THE USE OF ANTI-NOISE BARRIERS AS A MITIGATION MEASURE FOR ROAD TRAFFIC ENVIRONMENTAL NOISE

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Abstract

Noise barriers consist an integral part of road infrastructure in areas where noise affects the health and the welfare of the residents. The construction, the installation and the operation of these roadside elements is characterized by advantages regarding the effective impairment of noise, and weaknesses which can be evaluated from mild to harmful to human life. The present study aims to contribute in the investigation of the positive and negative factors per aspect of study that affect noise barriers in order to identify areas of concern that require further research with a view to the improvement of specific areas and the obtainment of benefits both in terms of functionality and road safety and also on the comfort of the residents of the area of influence.

Keywords: Noise barrier, environmental noise pollution, traffic noise, population exposure, avantages, weaknesses
35. EFFECTS OF C-ITS ON THE ENVIRONMENTAL FOOTPRINT OF VEHICULAR TRAFFIC AT SIGNALIZED INTERSECTIONS

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Abstract

Traffic congestion induces excessive emissions and fuel consumption compared to free-flow conditions, since vehicles are subject to stop-and-go traffic, long idling periods and deceleration/acceleration maneuvers. These later conditions prevail frequently around signalized intersections. However, recent advancements in communication technologies offer new possibilities regarding the energy efficient management of urban street traffic. Cooperative mobility systems (C-ITS) allow the exchange of messages and information between vehicles and the road infrastructure (i.e. traffic signals) to serve the aforementioned goal. The Energy Efficient Intersection Service (EEIS) utilizes the Signal Phase and Timing (SPAT) message and a velocity planning algorithm to provide energy efficient speed advices to drivers. This study assesses the environmental impacts and the real-world applicability of the EEIS through simulation experiments. A microscopic simulation model developed in AIMSUN for the city of Thessaloniki, Greece, is used to conduct this assessment.

Keywords: Emissions, fuel consumption, cooperative intelligent transportation systems, traffic simulation.

SESSION E: POLICY, MANAGEMENT AND OPERATIONAL ASPECTS IN MOBILITY

Chair: G. Aifantopoulou – N. Eliou

8. THE EXPLOITATION OF A CONTROLLED PARKING SYSTEM IN THE MUNICIPALITY OF THESSALONIKI. CALCULATING THE IMPACTS OF ALTERNATIVE PARKING PRICING POLICIES AND ESTIMATING SCENARIOS

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Abstract

Called to seek fresh thinking in mobility management, the European cities present more than ever before a particular strong interest in parking management. In contrast with the old parking paradigm where parking problem was treated as a problem of inadequate parking supply whose solution lies on abundant, free and on a first-come basis parking provision, the rational of parking management is conscripted so as to combat traffic and environmental problems. At the new parking approach, parking policy should reflect and simultaneously respect the particular needs of each area and should be applied in a flexible way so as to serve an holistic and integrated development plan. Smart Growth Parking Policies from the other side favors priced parking policies where user pays directly for the parking facilities it uses. However, the parking management cannot stand alone without being embedded in a wider framework of mobility management measures. Furthermore,
a key point at establishing successful and efficient parking management policies is the development of a well operating enforcement and monitoring mechanism that ensures citizens' compliance and acceptance. At this framework, the current paper examines the special case of Thessaloniki’s Municipality, one of the largest Municipalities in Greece that presents severe traffic problems with this of illegal and irrational parking to be ranked in the top of the list. Thessaloniki’s wider urban area consists of 7 Municipalities and accommodates, according to 2011 Census data, approximately 800.000 citizens. It spans over 1500 km2 (with a resulting density of 665 inhabitants per km2), the existing transport system of which accommodates a demand of over 1.3 million vehicle trips and 2.5 million passenger trips per day. Thessaloniki’s historical center attracts more than 300.000 trips per day. More than 18% of these trips are executed during the morning peak period (8.00 to 11.00 am). The modal split during this period is 72.3 % car (of which 3.4 % is taxi), 26.7 % bus (the only public transport mode currently available in Thessaloniki) and 1% bike.

Making use of the transportation model of Thessaloniki developed by HIT/CERTH, the current paper tries to evaluate the impacts on traffic and environmental indicators from the implementation of a controlled parking system. The results verified the initial considerations; when the parking system becomes controlled and a strong enforcement mechanism applies, the modal split changes in favor of the public transport (PT) system providing as a consequence additional environmental benefits. Increasing the current parking price at around 0.80€ per hour from the currently used, the PT share will increase by even 4%. The model results revealed also that by simply increasing the enforcement level, the PT share can also increase more than 4%. As a result, the impact on modal split can be higher if we combine the correct parking pricing with an intense enforcement and control structure. Furthermore, feeding the EMEP CORINAIR methodology with the results of the model, the reduction in CO emissions reaches even the percentage of 20% in the short term horizon and the 33% in the long term one.

Keywords: parking management, parking pricing policy, traffic and environmental impacts, traffic models, enforcement

26. SIMULATION-BASED EVALUATION OF EVACUATION EFFECTIVENESS USING SENSITIVITY ANALYSIS

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Abstract

Worldwide, manmade or natural phenomena occasionally occur, that form emergency conditions and require the evacuation of an area. Drivers' behavior becomes a very important factor for the evacuation's operation. This paper is an analytical research of the effectiveness of evacuation according to drivers' behavior, using the sensitivity analysis method. Collecting real-time data about that factor is a difficult to impossible task for large scale cases, therefore, traffic simulation is the most appropriate method for analysis. Our goal is to investigate how drivers' aggressiveness affects the evacuation effectiveness. The drivers' behavior model is chosen through all-at-once sensitivity analysis of the parameters. This model is applied to some demand scenarios for some important parameters' value ranges, regardless of the application of improvement actions. Finally, duration ranges of the evacuation and the number of the evacuated people are coming of this investigation, such as findings about the application of improvement actions.

Keywords: Evacuation, simulation, all-at-once sensitivity analysis, driver behavior, Santorini.
52. ASSESSMENT OF LOS AT PEDESTRIAN STREETS AND QUALITATIVE FACTORS. A PEDESTRIANS’ PERCEPTION APPROACH

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Abstract

The focus of this paper concerns the level of service (LOS) of walking facilities, as perceived by pedestrians. This investigation is based on the hypothesis that pedestrians also consider elements of trip quality, apart from components relevant to the traditional approach of LOS calculation (e.g. path width, pedestrian flow etc.), for their evaluation. This study examines the perceived LOS of two connected pedestrian streets at the Municipality of Kalamaria, a suburban area located at the city of Thessaloniki, Greece. The perceived LOS was estimated through a questionnaire survey, by taking into consideration the following qualitative factors: attractiveness of land use in the wider area, perceived comfort, safety and security, public transport service, parking service, traffic flows and delays, disabled people’s facilitation, pedestrians’ and bicycles’ service. The initial analysis indicated that all of these factors are related with the perceived LOS to some extent. Moreover, an ordinal regression model was developed, for the LOS estimation. The model results identified as the most important factors the gender of pedestrians, the age, the frequency of walking, the comfort, the traffic flows and delays as well as the disabled people’s facilitation.

Keywords: Level of service (LOS), pedestrian street, pedestrian perception, qualitative factors, ordinal regression model

53. EFFICIENT MANAGEMENT OF PARKING UNDER CONSTRAINTS

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Abstract

Traffic simulation models allow the evaluation of road networks and are used as a fundamental tool for traffic management, including parking management. Traffic simulation is a mature field with several decades of research. However, most existing studies focus on traffic simulation under normal traffic conditions. Traffic simulation of mixed networks in conditions close to exceeding capacity or in emergency cases is still a challenge. This research focuses on the development of solutions for the management of largescale parking facilities and depots (for either passenger vehicles or commercial fleets) under constraints including near capacity demand, temporally concentrated arrivals/departures and need for emergency evacuation. An integrated methodological framework will be developed that will operationalize a cycle created from the following main methodological and technological challenges/ components, mainly microscopic parking facility simulation, vehicle localization support in indoor environment (where GPS devices are unavailable), information generation- dissemination and control and strategy generation for the optimal parking management schemes. For understanding of the needs that exist in the context of this research two experiments were conducted in the area of the National Technical University (NTUA) campus, in a similar environment to that in a large parking facility. The experimental setup is analyzed in detail and from the first analysis of the available data some conclusions are drawn.

Keywords: parking simulation, evacuation, emergency, vehicle localization, traffic information dissemination, large-scale parking facilities
75. POLICIES FOR ENHANCING MOBILITY IN ACADEMIC CAMPUSES: THE CASE OF CERN

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Abstract

This work analyzes existing transportation conditions and needs of the CERN community and evaluates solutions for establishing a sustainable transportation system for the CERN community. Stated and revealed preference models are developed to analyze the travel habits and satisfaction patterns of CERN community members. Following, different mobility policies are structured and evaluated using simulation. Findings support the implementation of combined strategies based on public transportation ticket subsidization and parking solutions outside the campus. Such policies are found to provide significant traffic and environmental improvements to CERN’s inner road network, pinpointing that the most efficient scenario, improves average delay and speed by approximately 13% and 6.5% respectively, while an improvement in the environmental conditions is also achieved with a decrease of 5.13% for CO2, 8.59% for NOx, 10.39% for PM and 5.26 for VOC.

Keywords: Campus traffic, MNL models, mode choice, simulation

41. A HOLISTIC APPROACH OF THE CORRELATION BETWEEN GDP AND AIR TRANSPORT THROUGH PANEL DATA ANALYSIS

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Abstract

In the present paper, the correlation between the economic activity (reflected in the GDP of the considered area) and the air transport activity is surveyed with the use of various methods. First, parameters which affect the air transport activity are identified. An overview of research and publications during the last four decades testify the existence of a form of correlation between GDP and the number of passengers who travelled by air. This form of correlation is improved in the paper by applying the panel data analysis and comparing it with the results of a pure time-series model. Historical data of air demand are categorized for seven geographical areas of the world, according to the analysis of the World Bank: North America, Europe and Central Asia, East Asia and Pacific, South Asia, Latin America and Caribbean, Middle East and North Africa, Sub-Saharan Africa. The panel data method is applied by calibrating two models: one with variable intercept per region and a second one with variable intercept and variable effect of GDP per region. Results of the panel data models are compared with results of a pure time-series model. The predictive ability of all these models is testified with the appropriate statistical tests. As more suitable is concluded the panel data model with variable intercept and variable rate effect of GDP.

Keywords: Panel data, air transport, passenger demand, economic activity, GDP, regression.
63. **CAPITALIZATION OF MED PROJECTS’ OUTCOMES: RECOMMENDATIONS FOR INTEGRATING PROJECT OUTCOMES INTO POLICY FRAMEWORKS**

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**Abstract**

Mediterranean Sea is a closed basin at the crossroads of Europe, Africa and Asia which is characterized by high congestion, due to the high demand coupled with the lack of “smart” traffic flows management, narrowly adopted intermodal transport schemes, and the maritime transport safety in the context of accident prevention. These areas comprise attractive fields of research initiatives with most important of which, the transnational cooperation programs. The main objective of this paper is to investigate the degree of contribution and the impacts of MED research projects on European policy-shaping and decision-making for the Mediterranean region. The approach that is pursued relies on the review and tailored consolidation of the main outputs and recommendations that were produced within the context of MED capitalization projects and the identification of the essential mechanisms and recommendations that support the integration of the project outcomes to their right policy frameworks. As a result, in accordance to the nature of category, i.e. public or privately oriented approach, tailored mechanisms are required, e.g. infrastructure development, as a public investment is strongly supported by detailed socio-economic analysis (cost-benefit analysis) and sound legal framework.

**Keywords:** Mediterranean Sea, policy formulation, research, capitalization, maritime transport.

69. **MULTI-STAKEHOLDER ASSESSMENT OF SMART SOLUTION IN URBAN-INTERURBAN FREIGHT TRANSPORTATION INTERFACES**

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**Abstract**

The objective of this paper is to formulate and implement a modular integrated evaluation framework for the assessment of smart solutions in the interconnection of interurban and urban freight transportation which portrays the complexity of the life cycle of these solutions in the supply-chain and assesses the system’s performance, efficiency and effectiveness and the impacts to the environment and the society. The solutions tested involve freight tracking and communication links amongst involved stakeholders. The assessment incorporates a social cost-benefit analysis which addresses the actual costs and the monetary benefits that incurred by the procurement of the monitoring equipment and the development of the communication platform, and a multi-stakeholder multi-criteria evaluation technique for examining the impact on all related fields.

In the small scale implementation, the system’s costs and benefits brake-even in terms of operating economic costs and benefits, with minor environmental and societal improvements. When simulating a large scale implementation, the benefits increase as compared to costs, as the impacts concern a wider area of application.

**Keywords:** Urban-interurban transportation interconnection, freight transportation, intermodal transportation, logistics, evaluation.
78. ADVANCED CARGO TRANSPORT INFORMATION SERVICES PLATFORM

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Abstract

This scientific paper presents the development process of a web-based platform providing advanced freight transport services in line with the characteristics of the Greek market and the needs of the road freight transport sector. As a first step for the development of the platform, a critical review of the international experience was conducted with regard not only to the algorithms that have been developed for cargo services auctioning and brokerage but also to relevant platforms that have been developed especially with the Greek context. Considering the aforementioned experience as well as the requirements of representatives of the Greek road freight transport sector, the process that was followed for the development of the platform's high-level architecture is being presented along with the benefits that are expected from the use of the platform for the involved stakeholders.

Keywords: Web-based platform for freight transport services, auctioning algorithms, brokerage of freight transport services.

33. SINGULAR SPECTRUM ANALYSIS – HYBRID FORECASTING METHODS WITH APPLICATION TO AIR TRANSPORT DEMAND

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Abstract

The Singular Spectrum Analysis (SSA) of time series provides for decomposition, noise removal, component grouping, and reconstruction (collectively called pre-processing) as well as prediction. It has also been employed as pre-processing in combination with other time-series prediction methods (neural and neuro-fuzzy approaches) to improve their accuracy. Recently, enhanced hybrid methods have been introduced, whereby prediction is applied to SSA-derived components (trend, seasonal, and noise) or groups thereof, and the predicted series is reconstructed from the latter by means of SSA. In this paper, we use a hybrid method, namely SSA-ANFIS (Adaptive Neuro-Fuzzy Inference System), for one-step-ahead prediction of the monthly passenger demand of two international airports (Heathrow, London and El. Venizelos, Athens) with very different traffic volume and characteristics. The hybrid method was developed in a Matlab code. In the case studies, the SSA-hybrid method was proven superior to the pure SSA method in terms of accuracy and robustness of its predictions.

4. THE POLY-SUMP METHODOLOGY AS A TOOL FOR SUSTAINABLE URBAN MOBILITY PLANNING AND ITS APPLICATION PROCESS IN THE REGION OF CENTRAL MACEDONIA.

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Abstract

Within the framework of this study, the Poly-SUMP methodology for the development of Sustainable Urban Mobility Plans in polycentric regions, as well as the implementation of the methodology in the region of Central Macedonia are analyzed. The methodology is based on the participatory approach and its main part is implemented by organizing a future search workshop. The final outcome of the methodology is the development of an action plan for the transport and mobility sectors within the study area in order to achieve the goals of sustainable mobility. In the region of Central Macedonia, most of the stakeholders were involved in the development of its action plan. The result was twelve essential actions which should be carried out over the next years. The main actions of this action plan are behavioral modification and awareness raising activities, rail network expansion and routes densification and uniform strategic planning at regional level. After the interviews which were conducted to key regional stakeholders, establishment of an integrated “regional transport authority” and bus services improvement displayed on the top of the list.

Keywords: Polycentric Sustainable Urban Mobility Plans, future search, Central Macedonia, spider diagram, action plan, participatory approach

7. IMPROVEMENT OF ROUTE OPTIMIZATION ALGORITHMIC METHODS WITH APPLICATION OF FUZZY SETS

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Abstract

The problem of determining the optimal circular path has become widely known for its difficulty in producing a solution and for the numerous applications in the scope of organization and management of passenger and freight transport. It is a mathematical combinatorial optimization problem for which several deterministic and heuristic models have been developed in recent years, applicable to route organization issues, passenger transport, storage and distribution of goods, waste collection, supply and control terminals, as well as personnel management. Scope of the present paper is the development and implementation of a practical, comprehensible and speedy heuristic algorithm to determine the optimum, symmetrical or non-symmetrical, circular route using fuzzy sets. The proposed fuzzy heuristic algorithm is compared to the corresponding deterministic models, with regard to the accuracy of the final solution and the complexity of the calculations needed to obtain this solution.

Keywords: Optimal circular route, traveling salesman, heuristic, organizing routes fuzzy sets.
9. FACTORS AFFECTING PROFESSIONAL DRIVERS' RESPONSE TO VARIABLE MESSAGE SIGNS

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Abstract

The purpose of this study is to identify parameters affecting professional drivers' response to Variable Message Signs (VMS). The study was conducted in the Athens Metropolitan area and was addressed through a stated preference questionnaire survey. The factors affecting professional drivers' route choice under the influence of VMS messages were analysed through the development of an ordered probit model with random effects, so as to take into account the correlation between ordered responses as well as to capture the heterogeneity between individuals. The results indicate that professional drivers' response is dependent on drivers' propensity to seek for via the radio traffic information as well as from the perceived usefulness of VMS. The analysis also suggests that the content of the message (expected delay and provision of an alternative route) affects professional drivers' willingness to divert. A new finding is that professional drivers are not affected significantly by the cause of delay.

Keywords: Variable Message Signs, professional drivers, drivers' response, discrete choice analysis, stated preference methods.

15. VIABILITY OF INVESTMENTS FOR THE DEVELOPMENT OF AN ELECTRIC VEHICLE CHARGING NETWORK IN GREECE

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Abstract

The objective of this study is to examine the viability of investments related to the development of an electric vehicle charging network in Greece. The study begins with an overview of the electric car market worldwide and in Greece, presenting also the legal and institutional framework of mobility electrification in the European area. Then a sales forecast of Electric Vehicles (BEV) in Greece for the period 2015-2020 is attempted, followed by indicative cost of BEV charging stations as obtained by contacting specialized companies and conducting market research. Finally based on the projections for BEV sales for the period 2015-2020 and the costs of charging equipment identified, a sustainability/profitability analysis of investing in a BEV charging stations network is discussed.

Keywords: Battery Electric Vehicle, charging infrastructure, cost of EV charging network.

18. FUZZY SUSTAINABILITY ASSESSMENT OF URBAN TRANSPORTATION VEHICLE TECHNOLOGIES

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Abstract

Sustainability assessment in transportation planning and selection of the best transportation mode among alternatives is a challenging process. The large number of variables, vague or qualitative indicators in the sustainability assessment and the subjective judgment of decision makers introduce uncertainty. Fuzzy logic methods combine vague and uncertain criteria with well-defined and/or quantitative criteria to obtain the best alternative. The proposed method incorporates vehicle technology, fuel properties and uncertainty into sustainability assessment for transportation planning or for the development of policy on energy, environment and transportation. The method uses a sustainability framework for transportation vehicles and fuzzy logic. The application of fuzzy logic in sustainability assessment was evaluated by comparing it with the weighted sum method, using both the sustainability performance of transportation vehicles, and the consistency of the final results. Overall sustainability rankings of vehicles are found to be consistent by using either method. The fuzzy set method produced more reasonable overall sustainability scores for a sample network sustainability assessment for various vehicle mixes.

Keywords: Sustainability Assessment, Vehicle Technology, Fuels, Fuzzy Logic, Hybrid

19. EXPLORING THE POTENTIAL OF A GREEN FREIGHT INTERMODAL TRANSPORT CLUSTER IN SOUTH EAST EUROPE

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Abstract

To face the increased pressure for economically and environmentally sustainable solutions, the European freight transport sector should explore its potential focusing among others on the development of efficient collaboration schemes. Recently, the term cluster, introduced by M. Porter in the 80s, seems to gain ground as a promising ‘tool’ for strengthening the competitive advantages of an industry or sector. During the last decades EU has shifted its political focus to innovation, knowledge economy and sustainable competitiveness; cluster-based strategies gained a central place in industrial policy in connection with the regional and the science policy at an EU level. This paper reports on the results of a national survey conducted in the framework of the GIFT- Green Intermodal Freight Transport project aimed to explore the potential of a green intermodal freight transport cluster in Greece. Main expected benefits of such a scheme concern the improved integration and efficiency across modes of transport and supporting logistics services, closer cooperation between the various supply chain actors as well as between actors and authorities to ensure the required supportive regulations as well as infrastructure. The potential of a transnational-cluster linking similar clustering initiatives in other South East European (SEE) countries is also examined.

Keywords: Green Intermodal Freight Transport, Cluster.
20. VALIDATION OF EVERSCAPE, THE EVACUATION SIMULATOR

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Abstract

This paper presents the validation of the evacuation 3D simulator known as Everscape against the conventional Stated Preference data collection methods. Everscape was developed under the cooperation of TU Delft and the Tokyo institute for the inference of the behaviour in case of a disaster. It seems that people behave much alike the human interactions observed in such situations and that unobserved features where able to be captured. However, as it is a rather new method its validity is still in question. This paper presents the comparison of the two data collection methods (Simulator and Stated Preference). The comparison is based on two statistically identical samples for which the decisions taken are investigated. The research concludes that at least for the statistically identical samples examined the results are statistically the same. Conclusions are drawn for the benefits of using such a tool against the conventional Stated Preference data collection methods.

Keywords: Validation, Simulator, Everscape, Evacuation, Safety

24. SHOULD WE PROMOTE CYCLE INFRASTRUCTURE IN ATHENS? - A TOTAL COST ANALYSIS

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Abstract

The paper investigates the use of cycle, a human powered (active) mode in comparison with the use of car, a motorized (passive) mode. Focused are regular adult travelers. It develops a methodology to assess the social costs of cycling as compared to car use in Athens, Greece. Cycle economics are still in their infancy, so the contribution is highly topical. Unit costs of cycling and car transport are estimated. Cycle in Athens is clearly underused, the main reason being barrier costs due to the car traffic. Investing in separated cycle lanes is beneficial to Athens society, reducing risk and feelings of unsafety among cyclists, thus increasing their share. The study furnishes evidence that in Athens a modal shift from car to cycle use and an investment in cycling infrastructure are socially desirable.

Keywords: cycle infrastructure, active transport, transport economics, social costs assessment

29. TRANSPORTATION-RELATED CLIMATE CHANGE ADAPTATION MEASURES

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Abstract

Authorities and stakeholders responsible for managing the impacts of climate change have lately turned their attention on adaptation measures dealing with the increased frequency and intensity of extreme weather events (EWE) and natural hazards (NH). In this quest for identifying optimal alternatives that will reduce the effects of climate change on human ecosystems, they are faced with a multitude of options. Based on the above and following a detailed literature review of both research efforts and actual case-study experiences, this paper consolidates adaptation measures and links them with the EWE and NH they mostly address. The measures presented are evaluated in regard to their contribution to reduced vulnerability of the transport system, and the temporal and financial resources needed for their implementation. This assessment is used as a basis for creating roadmaps that can serve as a tool for improved decision-making on climate change issues.

Keywords: Climate change, adaptation measures, roadmaps.

39. ROAD SAFETY TRAINING THROUGH A MASTER COURSE IN BELARUS

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Abstract

Road safety is a multidisciplinary and multivariate scientific field, where every proposed action and measure should be developed and supported through strategies in the areas of engineering, enforcement, education and emergency medical services, taking into consideration social and economic aspects as well. However tools do not create the road safety future, trained professionals do. A robust educational curriculum is the only mean to communicate the necessary insights and knowledge within the constantly evolving environment of road safety. The objective of this paper is the comprehensive proposal for the development and testing, in Belarus, of a Masters Course in road safety according to the Bologna process requirements. In the framework of this proposal, the requirements set, the masters’ curricula modules as well as the relevant expected learning outcomes are described.

Keywords: Road Safety, Masters’ Curricula Modules, Learning Outcome, Belarus, Be-Safe

42. INTEGRATED URBAN AND TRANSPORT PLANNING IN TOURISTIC AREAS TOWARDS SUSTAINABLE MOBILITY. THE CASE OF RETYMNO, CRETE

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Abstract

Sustainable Mobility is a key factor in order to achieve sustainable tourism. In New Zealand tourists' transport represents for the 65 % of tourists' total energy consumption (Becken et al. 2003). Moreover touristic areas generally have high physical and cultural value and should be protected from environmental degradation caused by car traffic. This paper contributes to these efforts by presenting the case of Rethymno, where a methodology for integrated urban and transport planning was used to shape the Sustainable Mobility Plan.

Urban form is one of the main factors influencing travel choices (Newman & Kenworthy, 1989). Rethymno is a Greek city located in the north of Crete. The wider area of Rethymno is a place with high cultural heritage and with a very interesting landscape. On the north the municipality has a 40 km long seashore, while on the south is mountainous (Picture 1). The municipality of Rethymno has 55525 residents, of whom 32648 live in the city. According to the Hellenic Statistical Authority (EL STAT, 2012), 79,000 tourists, of whom 90% originated from foreign countries, arrived in Rethymno in July 2012 (peak season).

The integrated urban and transport planning methodology consists of the following steps:

1. Implementation of cycle infrastructure in connection to the demand for low energy consumption conveyances between the city center, the neighborhoods and the suburbs.
2. Signage of long-distance green routes for bus, bicycle or pedestrians, which connect attractive places of the mountainous municipality with the city (picture 3).
3. Implementation of a competitive main public transportation facility, parallel to the coastline with high standards to attract residents and visitors serving the connections between the most developed suburbs, the neighborhoods of the city and the city center.
4. Development of public transportation feeding modes (bus-taxi, bike & ride, park & ride) to make every suburb accessible with public transportation. Three mobility centers could be placed along the main public transportation corridor to foster mixed-mode traveling.
5. Implementation of bike-sharing system, including all suburbs of the metropolitan area and all neighborhoods of the city of Rethymno. This system could be vital to serve neighborhoods and suburbs with difference in altitude, where bicycles could be used only for one-way conveyances.
6. Implementation of road pricing policies (congestion – park charging) in order to collect funds for the implementation of the sustainable mobility plan and to make car use less competitive.
7. Pedestrianization of the city center for improving environmental conditions and for making car use less efficient than public transportation (picture 5).

Rethymno's sustainable mobility plan did not provoke negative reactions and gained support at the public meetings, despite the radical changes proposed.

Keywords: Sustainable mobility, combined urban and transport planning, sustainable tourism, sustainable urban mobility plans.
43. SYSTEMATIC DATA COLLECTION FROM SOCIAL MEDIA FOR TRANSPORTATION RESEARCH

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Abstract

This paper focuses on the data collection and data analysis from Social Networking Services and particularly from Twitter for uses in transportation. The data collection methodology is presented and some initial descriptive statistics are derived concerning users and their posts. A first spatial analysis is conducted using the data from the geo-location service offered by Twitter. The results of the analysis present trends on the use of Twitter for leisure activities and there is correlation between areas where most tweets are posted and income at those areas. In conclusion, the potential of using data from Social Networking Services is presented as well as the related issues.

Keywords: Social Networking Services, Twitter, Data Collection.

48. COMPLEX NETWORK ANALYSIS ON TRANSPORTATION NETWORKS

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Abstract

This paper presents the application of complex network analysis and graph theory measures for transportation networks. Concerning complex network analysis, the networks used were examined on their structure and their properties. The analysis focus on small world networks and the scale-free property. It was found that small world properties can be an appropriate modelling structure for transportation networks also in Greece while the scale-free property is not widely met. The analysis was performed on the highway network of Europe, the Thessaloniki urban network and the Thessaloniki Public Transport network. For the two latter, graph measures were applied and analysed.

Keywords: Complex Network Analysis, Small World Networks, Scale-Free, Graph Theory.
50. MODELING INTERMODAL FREIGHT FLOWS WITH COMBINED USE OF TRANSTOOLS AND CUBE CARGO. CASE STUDY: FREIGHT TRANSPORT IN THE LOGISTICS CHAINS CROSSING THE ADRIATIC SEA

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Abstract

The Transtools model developed by the EU includes a detailed freight model both for the supply and the demand side. Nevertheless, we have identified a number of deficiencies. Although it describes in detail the road and the rail network in Europe, it poorly describes the maritime network. Also, it only provides unimodal simulation of the freight flows without being able to simulate intermodal corridors. This is considered problematic especially in cases such as the Adriatic-Ionian Euroregion where MOS links with their various RORO and small LOLO feeder lines are forming a dense multimodal freight transport network. Correcting the model of the supply network in Cube software and updating the demand side using the technique of transport logistic nodes in Cube Cargo, we improve the approach of Transtools for freight simulation in the study area achieving simulation of transshipment from road and rail to the maritime network in the Adriatic Sea.

Keywords: Intermodal corridors, freight simulation, Transtools, Cube, Cube-Cargo, Adriatic Sea, freight flows, logistic-nodes, MOS

51. SUSTAINABLE STUDENT MOBILITY IN THE CITY OF SERRES

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Abstract

Mobility management calls for a focus on travelers and parameters involved in travel choices. In medium-sized cities with a significant number of students, studying and managing student mobility can contribute to the overall mobility management. This paper presents a research undertaken in Serres, location of the Technological Educational Institute (TEI) of Central Macedonia, recording, analyzing and assessing student mobility patterns towards TEI premises. The aim was to highlight student mobility practices within a medium sized urban centre, which directly affects the city quality of life and highlights the broader mobility habits in it. The paper presents the methodology and the results of an Internet-based research and formulates suggestions for more sustainable student mobility. Finally, it draws some conclusions about how mobility management of this important population group can be of benefit for the broad public through the adoption of policies towards sustainability.

Keywords: sustainable mobility, student mobility, city of Serres, medium sized urban areas, alternative modes
55. EXPERIMENTAL EVALUATION OF INS/GYRO SMARTPHONE SENSORS FOR LAND VECHICLE NAVIGATION: PRELIMINARY TESTING AND RESULTS

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Abstract

This paper attempts a preliminary assessment of the navigation sensors embedded in contemporary smartphones for use in transportation engineering and land vehicle navigation related applications. Specifically, this work concentrates on the performance characterization of MEMS (Micro-Electro-Mechanical Systems) inertial and gyroscope sensors, namely the iPhone 5 and HTC One S. The evaluation process relies on the extraction of a reference trajectory derived using a high (geodetic) quality GNSS/INS system. Data analysis reveals that contemporary smartphones have great potential for Intelligent Transportation Systems depending on application needs (positioning accuracy, reliability, availability) and the processing methodology adopted.

Keywords: smartphones, land vehicle navigations, IMU, INS, GYRO.

58. TRANSPORT GOVERNANCE MAPPING IN THESSALONIKI, SWOT ANALYSIS AND RECOMMENDATIONS

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Abstract

Effective governance plays a major role in the field of transportation since an effective implementation can potentially promote the development of the sector and ensure the delivery of high-level transport both in terms of services and infrastructure. The present study focuses on governance mapping in Thessaloniki, Greece, in the framework of proposing an integrated governance approach that is considered necessary in order to improve transport services in the area. The mapping includes the public authorities with transport policymaking power but also the operators, as part of the functional activity towards the setup of cooperation platforms. The methodological approach that was adopted for the governance mapping covers all levels (National and Regional/Urban) and all public transport modes, while stakeholders and operators have been classified according to their activities related to policy, planning, operation, management and financing.

Keywords: Transport policy, governance, transport management, governance mapping, transport authority.
59. **STIMULATING ITS DEPLOYMENT IN EUROPE: BARRIERS AND RECOMMENDATIONS**

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**Abstract**

The paper aims to explore the critical factors that affect the deployment and prospects of Intelligent Transportation Systems (ITS) in Europe. The research starts with a brief outline of the European transport policy placing emphasis on ITS and is followed with a sound collection of 70 ITS successful implementations. All 70 of them have been critically reviewed using specific criteria defined for that purpose, such as the level of user acceptance and the degree of penetration in the transport modes. Several interesting findings related to ITS deployment across Europe have been derived, such as the vast majority of ITS applications implemented for road transport (64%), following the predominance of road transport movements. Furthermore, a large number of barriers and gaps that prohibit the wider ITS deployment are discussed. Finally, the authors provide concrete recommendations for tackling these barriers and accelerate the deployment of ITS in Europe.

**Keywords:** Intelligent Transportation Systems, European ITS Policy, Information and Communication Technologies in Transport.

60. **INTEGRATING CITY LOGISTICS INTO URBAN MOBILITY POLICIES**

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**Abstract**

The formulation of urban mobility policies should not neglect the component of urban freight transport and the so-called city logistics organization. Sustainable mobility policies and methodologies of SUstainable Mobility Plans (SUMPs) can be applied in the field of goods mobility following an appropriate adjustment and study of local conditions. The paper deals with the formulation and implementation of a specific methodology for including into the SUMP of an urban area, elements of a SULP (SUstainable Urban Logistics Plan). The relation between urban mobility policies and freight transport is being briefly presented, as well as a pallet of measures improving urban freight performance and the procedure of a SUMP enrichment by such issues, focusing in a medium sized Greek city, Serres. Conclusions are drawn as regards the involvement of relevant stakeholders, an integrated approach of urban mobility issues and their integration into urban policy agenda.

**Keywords:** City Logistics, urban mobility policy, Sustainable Mobility Plans (SUMPs), Sustainable Urban Logistics Plan - SULP.
61. TOWARDS A MODERN ESTIMATE OF “VALUE TO PREVENT A FATALITY” FOR ROAD CRASHES IN GREECE

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Abstract

The value of preventing a fatality (VPF) is important in evaluating the overall cost of road crashes, but also in more local cost-benefit analyses of individual projects. Determining a single value of preventing a fatality is very hard, as there are many parameters that affect it. In this research, we explore the variability of this value with respect to the road environment, as well as its sensitivity to externally provided information. The process is based on state-of-the-art econometric models (ordered probit and random effects ordered probit models), using data from stated preference surveys, with separate scenarios for urban and rural roads. The theoretical constructs of “willingness to pay to reduce a fatality” (WTPF) and “value of (statistical) life” (VOSL) are used.

In terms of the impact of the road environment, the WTPF for the rural area is found 3.6 times higher than for the urban environment. This finding is consistent with the literature and can be interpreted as a higher perception of traffic risk associated with rural trips over urban trips. When the WTPF is weighted by the traffic volume, this difference is reduced to 1.85 times higher VOSL for rural over urban trips. Furthermore, the impact of information effects on the willingness-to-pay to reduce traffic risk is investigated. In this case, stated preference surveys are used to infer how (true, but partial) information may influence risk valuation in general (everyday life).

The estimated values of statistical life seem somewhat high compared to other estimates around the world. However, they are consistent with similar studies in Greece. Furthermore, the VOT for all cases has a reasonable magnitude, suggesting that the WTPF/VOSL differences are not due to a major discrepancy in the perception of the respondents.

Keywords: Road safety; value of statistical life; value of preventing a fatality; stated-preference surveys; ordered probit; random effects ordered probit

62. A DECISION SUPPORT SYSTEM FOR EVALUATING THE ATHENS BUS NETWORK LINES

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Abstract

Performance monitoring of transit systems is critical both for system re-design and improvement of provided services. Performance can be described through various indicators, while excessive amount of data if often required for that purpose. As such, modern data management technologies are necessary for handling performance measurement information. This paper presents a decision support system (DSS), tailor made for managing performance data and measures for the Athens bus operator (OSY). The DSS is based on a database and a graphical user interface, through which performance information can be analyzed for individual bus lines.

Keywords: Performance, Performance Indicators, Analytical Hierarchy Process, Decision Support System
64. INVESTIGATION OF ISSUES FOR IMPROVING ENERGY CONSUMPTION AND ENVIRONMENTAL IMPACTS IN RAIL FREIGHT TRANSPORT

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Abstract

The main goal of this study is to investigate the technical and organizational conditions in order for intermodal rail freight transport to be energy and environmentally more efficient than the respective road transport. The investigation was carried out using a model, which takes into account the technical characteristics of the railway track as well as the characteristics of the locomotives, the transported units and the rail wagons. The analysis performed resulted in the conditions that must be satisfied in order for intermodal rail freight transport to have a positive contribution on the environment (advantageous gradient profile, high load factor, suitable rolling stock, optimization of wagon loading, electric traction with energy produced by sources with a reduced carbon footprint).

Keywords: energy, emissions, railway transport, carbon footprint

70. ASSISTING TRANSIT OPERATORS IN DESIGNING SUSTAINABLE BUS ROUTE NETWORKS

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Abstract

This paper aims at presenting a web-based decision support system (DSS) with GIS capabilities that will aid transit operators in designing sustainable bus route networks. The authors address the Transit Route Network Design Problem (TRNDP) enhanced with environmental considerations. The DSS incorporates a TRNDP model and a genetic algorithm-based solver, while the design objectives of the model incorporate sustainability in the form of energy efficient routes. The DSS has been tested in the medium sized Greek city of Heraklion. A number of experiments indicate that the use of DSS for network design and vehicle scheduling creates a transportation network that is both operationally efficient and environmentally friendly. The DSS is also characterized by user-friendliness, adaptability, ability to support decisions and speed. The GIS based form of the system aids in (a) easy and straightforward problem setup (including parameters, assumptions and constraints), and (b) direct and clear depiction of results.

Keywords: Decision Support System, Transit Route Network Design, Genetic Algorithms, GIS.
74. DEVELOPMENT OF A NATIONAL CITY NETWORK FOR SUSTAINABLE URBAN MOBILITY PLANS: PROBLEMS AND PERSPECTIVES

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Abstract

Sustainable Urban Mobility Plans (SUMPs) have been for some years now an important tool for municipalities and regions in the European Union (EU) Member States for achieving their goals towards their jurisdictions and improving the daily life of their citizens. The EU has adopted the SUMP approach and support all related efforts through various actions and initiatives. Along these lines, the transnational project ENDURANCE attempts to promote the concept of SUMPs by creating national networks of cities and other entities that would agree, by joining them, to start developing such plans in their area. There are several different examples of such networks in the EU at European or national level. For Greece, the effort is in progress and so far meets the positive response of several Municipal Authorities. The issues that need to be addressed are not few and definitely not minor, with most important ones the lack of appropriate staff in municipal and regional services, the lack of relevant experience and culture and the lack of funding. Moreover, the absence of an appropriate policy about Sustainable mobility at the national level, which would set a framework for the lower levels of government, creates additional difficulties in achieving the sought objectives. To cope with these problems, specific proposals are made based on relevant recommendations by experts and also from round table discussions at recent events about this subject.

Keywords: Mobility Management, SUMP, Sustainable Transport, National Networks, Dissemination, Good Practices, European Transport Policy

76. HOW DOES SOCIO-ECONOMIC STATUS AFFECT THE USE OF CRS AND SEAT BELTS? PRELIMINARY RESULTS FROM A STUDY IN ATHENS

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Abstract

Socioeconomic status (SES) seems to have a clear relation to several health issues, with traffic injury risk being one of them. The aim of this study is to examine the link between SES and the use of restraint systems for young children and the adults accompanying them, on their everyday commute, to the nursery school. The study is based on a statistical analysis of data, from 734 children, collected from municipal nursery schools, in three suburbs of Athens: (i) Fyli (low SES area), (ii) Ilioupoli (medium SES area) and (iii) Kifissia (high SES area).

Although 90% of children are driven to school a large percentage of respondents specify that they do not use CRS systematically (26%), or driver seatbelt (9%) for this commute. Logistic regression model results show that the use of driver seat belt and CRS are influenced by SES of the family and the SES of the area.

Keywords: Road safety, socioeconomic status, child restraint system, seat belts, pre-schoolers
77. CRITICAL CHANGES IN ROAD SAFETY DURING ECONOMIC RECESSION. A COMPARISON BETWEEN GREECE AND THE USA

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Abstract

In Greece from 2009 to 2014, there was a dramatic reduction in the gross domestic product (GDP) as a result of the economic recession which officially started in 2008 but the consequences in the everyday life started to be obvious in 2010. In 2013, GDP had declined by 19.4% compared to 2010. Within such conditions, a significant reduction of the traffic volume and significant change of road accidents was recorded. Road fatalities in 2014 decreased by 45% since 2009 and 52% since 2004 following a reduction which has started in early 00s. This trend of road safety level occurred also in other countries with similar economic problems. In the USA the economy downturn of 2008 had a significant effect in accidents and fatalities reduction. This paper compares the changes in accident number and other accident characteristics between USA and Greece during the recessions. We examine the reduction and the contribution in the total reduction of each age group, the person role, the type of involved vehicle etc. The results show both similarities and differences. In Greece, the reduction of fatalities in ages between 26 and 35, passenger fatalities and car involved fatalities have more significant reduction than other categories. Weekdays and weekends have not several differences in terms of fatalities numbers and also accidents with motorcycle and bicycle have smaller reduction.

Keywords: economic crisis, road accidents, fatalities, road user characteristics

82. THE IRAP STANDARDIZED PROTOCOLS AS A TOOL FOR INFRASTRUCTURE ROAD SAFETY INSPECTIONS: THE NR6 I/C VELESTINO (A1) - VOLOS ROAD SECTION EXAMPLE

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Abstract

The aim of the paper is to present the implementation of the iRAP standardised protocols in Greece for the assessment of the infrastructure's road safety capacity, within the framework of the provisions of the 2008/96/EC Directive on road infrastructure safety management. An example regarding the inspection and analysis of the NR6 I/C Velestino (A1)-Volos road section is presented in order to illustrate the way that these results should be taken into account when designing road maintenance or rehabilitation investment plans. During this inspection, a specially equipped vehicle collected information from the road and the surroundings in 100m road sections. This information was then analysed to assess the infrastructure risk factors that influence the likelihood of a crash occurring and its severity, the risk level of road sections and award the Stars Performance of the road (Star Rating). On the basis of this analysis, the appropriate action plans were determined, in order to improve the road safety, which will maximize the benefit over spent cost of the investments.

Keywords: Road safety inspections; Road safety ranking; Road safety assessment; Star Rating; Road Safety Audits
Machine Vision
- Acquisitions of images
- Traffic Flow Data
- Automatic Number Plate Recognition
- Breast Lump Detection
- Solar Energy Use in Desalination
- Graphics Recognition, Video Image Processing
- Economic Impact Evaluation
- Traffic Light Management

Radar
- Traffic Flow Data
- Automatic Number Plate Recognition
- Breast Lump Detection
- Solar Energy Use in Desalination
- Graphics Recognition, Video Image Processing
- Economic Impact Evaluation
- Traffic Light Management

Licence Plate Readers
- Acquisitions of images
- Traffic Flow Data
- Automatic Number Plate Recognition
- Breast Lump Detection
- Solar Energy Use in Desalination
- Graphics Recognition, Video Image Processing
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ΟΔΙΚΗ ΑΣΦΑΛΕΙΑ & ΣΦΑΙΡΙΔΙΟΒΟΛΗ
Γιατί αξίζουμε οδικές υποδομές ποιότητας για μια καλύτερη ζωή

Οι σύγχρονες οδικές υποδομές που κατασκευάστηκαν και λειτουργούν στη χώρα μας, άλλαξαν το χάρτη και την ποιότητα των μετακινήσεων μας. Παράλληλα, το Εθνικό Οδικό Δίκτυο επεκτείνεται και αναβαθμίζεται. Για τη διασφάλιση της βελτίωσης λειτουργίας και της ποιότητας των παρεχόμενων υπηρεσιών τους, οι αυτοκινητόδρομοι και υποδομές με διόδια που λειτουργούν στην Ελλάδα δημιούργησαν τον νέο φορέα, «Ελληνικές Υποδομές και Οδοί με Διόδια» με τον διακριτικό τίτλο “HELLASTRON” (HELENIC ASSOCIATION OF TOLL ROAD NETWORK). Αυτήρα μη κερδοσκοπικός, ο νέος φορέας ξεκίνα να υπηρετεί τον τεχνοκρατικό και συμβουλτικό του ρόλο, με στόχο την προώθηση της ποιότητας των οδικών μεταφορών προς όφελος όλων μας.