Transport Studies Group - Annual Report 2010

INTRODUCTION

Another successful and interesting year for the Transport Studies Group which saw the commencement of a major ESPRC award on demand responsive transport “DRT for DRT” and the award of an ESRC network on sustainable aviation. 2010 also saw the launch of a new journal Research in Transportation Business and Management co-edited by Steve Ison and Mary Brooks (Dalhousie University) and published by Elsevier. Steve Ison and Jon Shaw (University of Plymouth) are series editors of a new book series on Transport and Sustainability from Emerald.

Four more Lunch and Lectures were hosted at Loughborough in 2010, the last two of which were webcast and recorded for the first time (see http://www.lboro.ac.uk/departments/cv/research/ts_g_eventslll.html). Robert Regue Grino was the first winner of the £500 Transport Planning Associates prize for the best transport MSc dissertation for his project entitled on “An investigation of the feasibility of implementing a freight tram scheme in Barcelona”.

STAFF CHANGES

Dr Chao Wang was appointed to a research post in August 2010 on the new EPSRC project DRT for DRT.

STAFF NEWS

Professor Abigail Bristow gave an invited “Distinguished lecture” plenary session on “Valuing Noise Nuisance” at INTER-NOISE 2010, the 39th International Congress and Exposition on Noise Control Engineering. She also Co-Chaired and organised a Structured Session on the “Economics of Noise for Sustainability”. She will be a session organiser and co-chair of a structured session “Economic Valuation of the Sound Environment” at the 40th International Congress and Exposition on Noise Control Engineering, Inter-noise 2011 Sound Environment as a Global Issue.


Professor Bristow was invited to continue as a member of the EPSRC Peer Review College 2010-2013. She also acted as a judge for the Shell Springboards regional finals, Churchill College Cambridge, 17th February 2010.

On 14th January 2010, Dr Lucy Budd was invited for a guided tour of Eurocontrol’s en-route air traffic control facility in Maastricht in the Netherlands. She subsequently co-authored one of Eurocontrol’s Climate Adaptation Case Studies (part of the Challenges to Growth Update Report) on the effect of changes in severe convection on air traffic flows through Maastricht Upper airspace.

In February, she was invited to speak on her research into aviation sustainability at the Association of Public Service Excellence (APSE) seminar at De Montfort University in Leicester. On 17th May, Lucy appeared on the BBC1 television documentary programme ‘The History of the World: The Man Who Shrank the Globe’ concerning Sir Frank Whittle and the invention of the jet engine. In September, she was invited to a conference in Iceland into the effects of Eyjafjallajökull on European aviation and, later that month, gave a presentation about her research into business aviation at a workshop on the global super-rich at Lancaster University.

As principal investigator of the lead partner, Dr Marcus Enoch chaired a project meeting of the £1m EC-funded project TRAVEL PLAN PLUS in Gyor, Hungary in May, and hosted a workshop on Local Travel Plan Networks in Cambridge in November. Dr Enoch was also a member of the judging panel for the ACT Travelwise Travel Plan Awards in the autumn.

Professor Steve Ison was involved in the launch of two new initiatives. First, a new journal Research in Transportation Business and Management, published by Elsevier. The co-editors are: Stephen Ison, Loughborough University (s.g.ison@lboro.ac.uk) and Mary R. Brooks, Dalhousie University (m.brooks@dal.ca). See http://www.elsevier.com/wps/find/journaldescriptio n.cws_home/724503/description Second, was the launch of a new book series Transport and Sustainability, published by Emerald. Series Editors Stephen Ison (s.g.ison@lboro.ac.uk) and Jon Shaw University of Plymouth (jon.shaw@plymouth.ac.uk). See http://www.emeraldinsight.com/products/books/series.htm?id=2044-9941

Dr David Pittfield holds two prestigious external appointments. The first is as a Visiting Research Professor at the Regional Economic Applications Laboratory, University of Illinois, from 2010 and the second is as a Senior Fellow of the School of Public Policy and Affiliate Associate Professor at George Mason University, Fairfax, Virginia, until June 2011. He has also given advice to the Lydd Airport Action Group on Aircraft Accident Modelling in preparation for a public inquiry in 2011. External appointments in the UK include the appointment as an External Assessor for the MBA Aviation Management degree for the British Institute of Technology & E-commerce (BITEC), London in conjunction with the University of Wales and as an External Examiner to an M.Phil thesis at the University of Wales, Cardiff School of Management, 2010. Finally he acted as a Reviewer of WCTR 2010 for Session Track A1 (Airports and Aviation) as well as for applications to the Research Grants Council of Hong Kong.

Dr Mohammed Quddus was promoted to Senior Lecturer in August 2010. He has accepted an invitation to join the advisory board of Accident Analysis and Prevention. In April 2010, he gave an invited seminar to the MIT School of Engineering (SoE) on his pioneering work on map-matching algorithms for critical transport applications. Dr Quddus became a fellow of Higher Education Academy and was invited to become a fellow of the British Computer Society.

Dr Tim Ryley hosted the ’Aviation and the Environment’ seminar in June 2010 as part of the Airport Energy Technologies Network (AETN). Speakers on contemporary environmental issues affecting airports included Roger Gardner, Anne Graham (University of Westminster), Richard Leigh (RDC Aviation) and Calt Weston (Aviation Environment Federation). Airport case study presentations included representatives from Heathrow, Manchester, Edinburgh and Doncaster Sheffield airports.

Dr Chao Wang was awarded the prestigious ’Chinese Government Award for Outstanding Self-Financed Students Abroad’ in May 2010 at the Chinese Embassy in London.
A number of academics and practitioners visited the Group for meetings, seminars and to contribute to the lunch and lecture series and to our teaching programmes, these included: Dr Jillian Anable, University of Aberdeen; Dr Colin Black, Contemporary Transport; Chris Cairn, Independent Consultant (formerly Airport Project Director at Newquay Cornwall Airport and Regional Airports Manager at the Department for Transport); Dr Nigel Dennis, University of Westminster; Geoff Dudley, University of the West of England; Nigel Foot, Aston University; Geoff Gardner, Atkins; Roger Gardner, Independent Consultant; Dr Anne Graham, University of Westminster; J ulia Gregory, BAA Stansted Airport; Stephen Holt, Transport Planner (formerly Ground Transportation Planning Manager at Birmingham International Airport); Norman James, STAR Consultancy; Stephen Joseph, executive director of the Campaign for Better Transport; David Knight, PTL; Richard Leigh, RDC Aviation; Professor Stephen Potter, Open University; Mike Snelgrove, University of Wales Institute, Cardiff; Sophie Tyler, University of Westminster; Dr James Warren, Open University; Dr Robert Watson, RWA Rail Loughborough; Calt Weston, Aviation Environment Federation and J acqui Wilkinson, Co-CEO of Beyond Engagement and former head of Sustainable Transport at the Department for Transport;

**PhDs AWARDED**

Mohammed Biteimal, Strategic Challenges facing Airports in Gaining Competitive Strengths: Lessons from the practice of Dubai Airport

Stuart Meek, Redefining car-bus interchange to reduce traffic.

Chao Wang, The Relationship between Traffic Congestion and Road Accidents: An Econometric Approach Using GIS.

**RESEARCH STUDENTS**

Other than those awarded degrees, the research students registered for PhD and EngD in 2010 were:

Farah Alamgir: Investigating business travel.

Saleh Altwaqiti: The application of GIS in transport planning: a case study of Riyadh.

Andrew Appleyard: Normalisation of accident data on or near airports and their Location.

Isobel Beetham: Investigating commuter travel choice behaviour and the provision of car parking facilities.

Tom Budd: Assessing the development of UK regional airports and the impact of the low-cost model on surface access.

Amy Campbell: Consumer response to new vehicle technologies

Narudh Cheramakara: Sustainable aviation in Thailand.

Christine Cole: Logistics and management of household waste collection.

Phil Darby: How work based interventions in large fleets can inform road safety policy.

Per Gegg: The impact of ETS on biofuel uptake in the aviation sector.

Keith Higham: UK airspace regulation in an era of privatisation and commercialisation.

Fahmia Khandokar: The role of travel plans at healthcare facilities.

J oe Kendal: Transport Planning in UK National Parks.

Clare Littleford: Factors influencing energy use behaviour by individuals in office settings.

Elias Maragakis: Wind Farms and Airport Planning.

Mohammed Abdullah Al Mamun: Travel Demand Management for Sustainable Urban Transport.

Robert Mayer: The change in air travellers’ behaviour due to increasing environmental awareness and sustainable transport policy and its impact on airline business models.

Onyemaechi Mereghin: Performance Evaluation for Ports in Developing Countries.

David Morris: Car free development in the UK: From the margins to the mainstream


Inum Sanaullah: Assessing the performance of road network using data from moving sensors.

Mike Snelgrove: An exploration of the potential of customer loyalty to distort airport choice behaviour.

J essica van Ristell: The role of the bus in school travel.

D. Towfiqi: A Model for Airport Project Management in the Arabian Gulf.

Omid Titiiezeh: Assessing transport implication of healthcare service re-location using GIS.

Xuan Zhao: Values of noise and quality of life in China.

**RESEARCH PROJECTS**

**AIR TRANSPORT**

The Prospects for Sustainable Aviation in the UK: Evaluating, Negotiating and Mediating between Competing Perspectives

ESRC Seminar Series (Jan 2011-Sept 2012)

TRAVEL PLAN PLUS

European Commission from November 2008 to June 2011

Grant holders: Dr Marcus Enoch and Professor Stephen Ison

Researcher: Dr Lisa Davison

Collaborators: Loughborough University (Lead Partner) (UK); Cambridgeshire County Council (UK); Mobycy (NL), Consell Comarcal Del Bages (ES), Municipality of Györ (HU), Swedish Road Administration (SWE).

TRAVEL PLAN PLUS stands for “Travel Reduction Attainment Via Energy-efficient Localities PLANning”. It is a project comprising six partners with expertise in mobility management, united by a vision that travel plans can be more efficient and effective if implemented jointly by local groups or networks of organisations (i.e. Local Travel Plan Networks) rather than on an individual basis so as to promote energy saving. The objective of the project is to promote energy efficiency through the use of LTPNs across the EU. This will be achieved by developing a framework in order to aid and promote the implementation and dissemination of LTPNs in a systematic way, to implement four LTPNs in representative locations across the EU, to monitor and evaluate these LTPNs, to provide recommendations for developing an effective policy framework and to encourage and support the widespread adoption of LTPNs across the EU.

The work undertaken will provide important guidelines on the implementation process of use to policy makers and implementers.

So far results from the state-of-the-art review, the implementation work packages, and the outputs of a workshop that was held in Cambridge in...
November are available at the project website. For further information, the contact is Dr Marcus Enoch (Tel: +44 (0)1509 223408; Email: m.penoch@bрабor.ac.uk). Project website is at www.travelplanplus.eu.

**DRT for DRT: Developing Relevant Tools for Demand Responsive Transport**

EPSRC from July 2010 to June 2013

Grant holder: Dr Tim Ryley Co-investigators: Dr Marcus Enoch, Dr Mohammed Quddus, Dr Lisa Davison. Researcher: Dr Chao Wang.

DRT is a transport option that can be simply conceptualised as a hybrid of a regular bus service and a variably routed taxi. The rise in private car use in the UK has major implications relating to how transport more generally is provided. One problem is that conventional public transport (i.e., bus, light rail and heavy rail) is steadily becoming a less viable travel option for more and more journeys, and consequently there is an urgent need for new alternatives to be developed. Demand Responsive Transport (DRT) is one solution that almost became a mainstream route during the 1970s and in the late 1990s/early 2000s, and would now appear to be making another attempt to become a viable travel option. The DRT for DRT research project will determine the existing position of DRT in UK; the potential demand for DRT services (of some type) at a local level; the most suitable types of DRT in each of the most promising of these local areas; the potential for DRT in delivering public transport services nationally; and the barriers and possible solutions to the realisation of this potential.

**ENVIRONMENT AND SUSTAINABILITY**

The ‘ABC’ project. Airports and Behavioural Change: towards environmental surface access travel

EPSRC from October 2009 to September 2012

Grant holder: Dr Tim Ryley Co-investigators: Dr Keith Mason (Cranfield University), Prof. Jaafer Elmirghani (University of Leeds). Researcher: Dr Alberto Zanni

The purpose of this research is to find proactive solutions to the challenge of encouraging better environmental behaviour of individuals to and from airports, in a bid to reduce the carbon intensive nature of the whole system. It examines the generated travel of both an international and regional airport and explores how technology and innovative systems can influence individual and segment travel behaviour. The two case study airports are Manchester Airport and Robin Hood Doncaster Sheffield Airport. Initially, a state-of-the-art review is examining airport surface access issues, formed of: a literature review; user group profiling; determining the carbon footprint of airports and generated traffic; and key stakeholder engagement, including a Delphi study to initiate scenario development. Secondly a technology evaluation considers the application and potential of innovations to reduce airport access route travel demand. Thirdly, the receptiveness for individuals to select existing and future options for energy efficient travel will be examined using revealed and stated preference data; advanced discrete choice models will be determine individual and segment willingness to pay for realistic technology advances. Finally, the carbon reduction potential of interventions will be assessed, to provide a basis for effective investment, and propose policy recommendations for a more efficient airport system.

**Airport Energy Technologies Network (AETN)**

EPSRC from July 2009 to JUne 2012

Grant holder: Prof Paul Stewart (University of Lincoln) Co-investigator: Dr Tim Ryley.

From 10-14 November 2008, a Research Councils’ Energy Programme Sandpit to generate and develop innovative approaches to airport operations was held, resulting in a number of funded projects. This Network proposal is also an output of the event, reflecting the unanimous view that a Network was indispensable to take advantage of the Sandpit energy and cross-disciplinary synergies. The raison d’etre of the network is to develop a research community and its links with the key industrial and commercial players. The proposed network is unique in this way, and will undertake a vital role in bringing its members high risk, high adventure research to general acknowledgement and acceptance. AETN events hosted by Loughborough University in 2010 included a two-day seminar on ‘Airports and the Environment’ in June and a PhD student training event (‘PhD for PhD’) in September.

**Future Resilient Transport Networks**

(FUTURENET)

EPSRC from July 2009 to April 2013

Grant holder: Prof Chris Baker (University of Birmingham). Loughborough University Co-investigators: Prof Neil Dixon, Dr Tim Ryley, Dr Matt Frost, Dr Paul Fleming. Other Co-Investigators from University of Birmingham, University of Nottingham, British Geological Survey, HR Wallingford Ltd & Transport Research Laboratory Ltd. Researchers: Dr Lisa Davison and Dr Alberto Zanni

Much current discussion about transport and climate change focuses on the impact of transport on climate change. Indeed, many mitigation measures are focussed upon the transport change, and many mitigation measures are focussed upon the transport sector. However, FUTURENET recognizes that climate change also has an impact on transport. This impact has two dimensions: an engineering dimension derived from the interaction between climate design, weather events and the physical network, and a socio-economic dimension derived from the interaction between weather and climate and the patterns of transport demand. FUTURENET integrates both in assessing the future resilience of the UK transport system. This interdisciplinary approach will assist stakeholders in adapting the transport network and increasing resilience of critical transport infrastructure. Specifically FUTURENET seeks to develop a number of scenarios for how the transport system in the UK might look in 2050, and will investigate the resilience of each of these scenarios to the effects of climate change. The investigation will be carried out through the five work packages:

a) WP1- The development of possible UK transport scenarios for 2050, through detailed literature surveys and the results of a number of expert workshops.

b) WP2 - Identification of route corridor for study and development of an inventory of infrastructure that covers the complete range of infrastructure for the chosen route.

c) WP3 - Models of the failure modes of transport systems, which will identify existing models and thresholds for the effects of climate on transport systems, and will develop new models where there are gaps in knowledge.

d) WP4- Model development and application, which will develop an overarching model framework that will combine the models identified in WP3 with climate change scenarios and the transport scenarios outlined in WP1, to enable the resilience of different types of transport network to be evaluated.

e) WP5 - Generic Tools and Dissemination, through which the results of the project will be made available in an accessible form to a wide variety of stakeholders, and the model of WP4 made available for application to other route corridors.

**FUTURENET** brings together a wide variety of academic expertise spanning the engineering, environmental and social sciences, together with a diverse group of stakeholders in the transport industry. It has the potential both to develop a deeper understanding of the underlying science on the effects of climate change on transport systems and to provide information and useful tools on how such systems can be made more resilient.

**Strategic Advice on Transport and Climate Change**

Commission for Integrated Transport: from October 2009 to January 2010

Grant holder: Professor Abigail Bristow

Professor Bristow was commissioned to provide advice on climate change and transport. The think piece covered developments since 2007 with a particular emphasis on identifying more cost effective instruments for achieving carbon savings in transport and is now available on the CfIT website alongside other reports commissioned at the same time: http://cfit.independent.gov.uk/pubs/2010/tcoThink 01/pdf/tco- think01.pdf

**Great Britain: An alternative travel destination?**

RGS-IBG ESPRC Geographical Research Grants from May 2009 to May 2010

Grant Holder: Dr Lisa Davison

This research examined individual and group leisure travel behaviour, in the wider context of household consumer behaviour to examine the potential for ‘staycations’ to replace more energy intensive holiday choices. It utilised an East Midlands household survey and interviews with groups of holidays-makers to examine the market
segments opting to holiday in Great Britain and the determinants and motivations which influence their destination choice.

**Tyndall Transition**

NERC, April 2009 to March 2010.
Grant holder: Professor Abigail Bristow
Researcher: Dr Alberto Zanni

This support allowed further work on the scope for long run reductions in freight transport emissions in London to take place as part of the Cities theme. This involved a detailed exploration of potential policies and has now been published in Energy Policy.

**TRANSPORT TECHNOLOGY AND SAFETY**

Real-time intelligent map-matching algorithms for advanced transport telematics systems (RiMATTS)
EPSRC from July 2008 to June 2011
Grant holder: Dr Mohammed A Quddus
Researcher: Dr Yuheng Zheng

The overall objective of this research is to develop an intelligent map matching (iMM) technique capable of supporting the positioning and navigation modules of most Advanced Transport Telematics (ATT) systems in all operational environments in real-time. Significant progress has been made over the last year including: the development of a low-cost vehicle tracking system in all operational conditions and the development of a map-matching algorithm for sparse low frequency GPS data.

Public Transport Accessibility Using GIS
EPSRC and JMP Consultants from July 2008 to June 2011
Grant holder: Dr Mohammed A Quddus
Researcher: Jessica van Ristell

The aim of the project will be to investigate public transport accessibility. This will be done using GIS as an analytical tool. The research identified the research gap and examined current mode choice behaviour of school children travelling to their school. A range of datasets are being employed: School Census 2009; index of multiple deprivation; land-use and road network data. A range of discrete choice models (e.g. multinomial logit and mixed logit models) were developed.

**Efficiency and Effectiveness of Domestic Waste Management and Logistics**

SERCO from October 2010 to September 2014
Grant holders: Professor Andrew Wheatley; Dr Mohammed Osmani; Dr Mohammed Quddus

The aim of this project is to improve the efficiency and effectiveness of waste management and the logistics of waste handling within Charnwood Borough Council. More specifically, the project will determine the fuel carbon emissions of vehicle use on the waste collection routes and assessment of optimum route design possibly using vehicle tracking, smart IT and GIS to optimize routes, safety and times of movement/street risk.

**PUBLICATIONS 2010**


DAVISON L.J. and RYLEY T.J. (2010) An examination of the discord between air travel and more generic environmental attitudes and behaviour. Paper presented at the 89th Annual Meeting of the Transportation Research Board,
Washington, DC, 10-14 January 2010.


positioning systems: A thematic analysis of positioning data from India, USA and UK, submitted to the 9th International Workshop on Transportation Planning and Implementation Methodologies for Developing Countries, 15th to 17th December 2010, Bombay


ZHAO X., BRISTOW A.L. and ZANNI A.M. (2010) A study of relationships between quality of life and road traffic noise value in Kunming city, China, paper to INTER-NOISE 2010, the 39th International Congress and Exposition on Noise Control Engineering, 13th -16th June, Lisbon.