Institute for Transport Studies (ITS)

UNIVERSITY OF LEEDS
Institute for Transport Studies

Introduction Dr Susan Grant-Muller

The Institute for Transport Studies (ITS) was delighted to have its position as one of the UK's leading transport research centres reflected in the results of the 2008 Research Assessment Exercise (RAE).

As the UK's largest free-standing academic transport department, ITS made the largest submission of transport research to the RAE, involving more than 40 staff. Of this, 95% was assessed as being of 'internationally recognised' quality for originality, significance and rigor, thus providing an excellent basis on which the Institute can look to the future with confidence.

Alongside this, the year was marked by a heightened focus on the impact of ITS research, complemented by proactive measures to engage with stakeholders and draw their needs into the research agenda. One particular example was the workshop with local and national stakeholders: 'Facing Environmental Change' attended by government, local authorities, consultancies, regional bodies and others. In terms of forward research activity, ITS is delighted to be playing its part in meeting the challenges of Britain's future energy needs through the prestigious new University of Leeds Doctoral Training Centre. Funded with £6.5M from the Engineering and Physical Sciences Research Council (EPSRC), the Centre will focus on sustainable technologies for a low carbon future. For further details of this and other aspects of ITS research please contact Dr Susan Grant-Muller, Director of Research (tel: +44(0)113 3436618, email: s.m.grant-muller@its.leeds.ac.uk).

RESEARCH FACILITIES

ITS maintains two major research facilities - the University of Leeds Driving Simulator (UoLDS) and the Instrumented City (IC).

Officially launched in 2008 following an investment of £1m+, UoLDS enables high quality research into driver behaviour and transport safety to be performed in accurately controlled and repeatable laboratory conditions. UoLDS is one of most advanced worldwide in a research environment - just five driving simulators exist worldwide with equivalent or superior motion characteristics. It incorporates an eight degrees of freedom motion system - lateral accelerations are simulated by sliding the vehicle cab and dome along a railed gantry whilst the whole gantry slides along tracks to create longitudinal acceleration cues. In addition, sustained cues are provided by a 2.5t payload, electrically driven hexapod. The motion-base enhances the fidelity of the simulator by providing realistic inertial forces to the driver during braking and cornering. It also provides lifelike high frequency heave, allowing the simulation of road roughness and bumps. Unlike many other simulators, especially in the UK, UoLDS continues to develop using in-house expertise. In a research environment, where a wide range of studies are frequently undertaken, maintaining the ability to tailor virtual scenarios and experimental data collection to the exact requirements of a particular investigation is hugely valuable. For more information please contact Hamish Jamson, UoLDS Manager (email:A.H.Jamson@its.leeds.ac.uk).

The IC is a suite of research facilities dedicated to transport and environment issues. The facility has been supported by two major infrastructure awards (JIF and SRIF2) totaling in excess of £3m. IC boasts an extensive range of state-of-the-art traffic, vehicle emission, meteorological, noise and air pollution monitoring instrumentation. These complimentary facilities allow researchers to simultaneously study traffic flow and congestion – emission generation – dispersing air flows – atmospheric chemistry - noise and air pollution. Its unique characteristic is the multidisciplinary approach, bringing together researchers from the disciplines of traffic engineering, dispersion modelling, atmospheric chemistry and noise. Many of the facilities are portable and can be employed in projects across the UK, including: Automatic Number Plate Recognition (ANPR) Systems, Instrumented Vehicles, an On-board 'Real-World' Vehicle Emission Instrument (CO, CO2, HCs at 1Hz), a Remote Sensing Device that measures vehicle emissions as they 'drive-through' a test site, meteorological, noise and air quality (CO, NOX, PM10, PM2.5, particle number count) instruments. Semi permanent installations, which provide high quality novel datasets for inter-disciplinary and collaborative research projects, include two metropolitan sites (one junction and one nearby section of road). These collect synchronous data on traffic flows, route journey times, vehicle emissions, dispersive in-street air-flows, noise and air pollution. The original foundations of the IC were dedicated links with the Leicester and Nottingham City Council Area Traffic Control (ATC) centres. These communication links have been in place for over a decade, collecting high time resolution data from dense detector networks, allowing the IC to amass a truly unique historic database of traffic flows, congestion and signal timings. Further details are available via the IC website: www.its.leeds.ac.uk/facilities/icity. For further details of research possibilities, data collection, equipment hire and other services, please contact Dr James Tate, IC Manager (email: j.e.tate@its.leeds.ac.uk).

Knowledge Transfer (KT)
'Knowledge Transfer' encapsulates the application of various University capabilities to non-academic environments. Given that ITS has long tradition of developing research in response to 'real-world' problems, the boundary between 'applied research' and KT can easily become blurred. However, in the period since the last TEC report there have been a number of specific KT initiatives, supported by the Higher Education Innovation Fund (HEIF):

- Developing a new transport model (MARS) in conjunction with Technical University Vienna and MVA consultancy.
- Making advanced choice modelling methodology available to practitioners in various sectors via new software.
- Developing support for a low carbon fleet operated by Leeds City Council.
- Applying new advanced network modelling techniques via OMNITRANS software.
- Offering training to the Rwandan Government, with funding sought from the World Bank.
- Engaging with the aviation industry with a view to establishing an air transport centre.

As part of this engagement process, ITS routinely invites industrial and other stakeholders to explore how new research can support their priorities. Recent events include:

- Facing Environmental Change – helping organisations to develop a low carbon future.
- IC Workshop - for the Institute of Environmental Management and Assessment.
- The MARS model – a briefing for local government decision-makers.

SOFTWARE

The highly successful SATURN highway assignment suite continues to be developed by its three partners: Atkins Ltd, Dirck Van Vliet and ITS. The full release of SATURN Version 10.8 was supplied to maintained users in April 2008, with regular updates following. The new version reflects the on-going development to provide both additional functionality and enhance the existing product. New features include major revisions to the matrix estimation process, refinement of the procedures to estimate marginal external costs of congestion (to support the design of road pricing schemes), as well as ongoing improvements to the new Origin Based Assignment algorithm for Multiple User Classes. Version 10.9 will be released in April 2009 with the Multi-Core version (SATURN-MC), allowing users to take advantage of

the latest multi-processor desktop PCs. Work will also continue to strengthen the links between SATURN and Geographical Information Systems. These developments will reinforce the SATURN as the industry standard for highway equilibrium assignment within the UK and overseas markets.

The DRACULA microsimulation package is also produced by ITS and distributed by Atkins Highways and Transportation. DRACULA shares a common network format with SATURN, allowing easy transfer of data between the two packages. DRACULA represents complete transport trip mechanisms, from a choice of where and when to travel, to the choice of mode and the simulation of the entire journey by motorised means at a microscopic (individual vehicle) level. DRACULA Version 2.4.2 was released in autumn 2008 featuring a new public transport model, the highlights of which include: an origin-destination based passenger demand model, links with PT-SATURN as its passenger route choice model, bus time-tabling and real-time bus holding. These features are fully integrated with the highway road traffic microsimulation, so that the effect of traffic congestion on public transport operations, delays and unreliability on passenger journeys can be measured. For further details of DRACULA please contact Dr Ronghui Liu, Senior Research Fellow (email: r.liu@its.leeds.ac.uk).

ALUMNI EVENT

Forty-two years of transport Masters at Leeds was celebrated at an alumni reunion dinner on 17th October 2009 at the Met Hotel in Leeds, (part sponsored by Arup, Atkins, First Group, IBI Group, JMP and Mott MacDonald) with musical entertainment by ITS' own tribute band Supertram.

Over 70 attendees included the first Institute Director, Professor Colm O'Flaherty, who had travelled from his home in Australia. Other alumni had come from as far as Indonesia, South Africa and Nigeria. All decades up to 2000 were well represented, including several graduates from the very first cohort of 1966. Earlier in the day 22 of the alumni had joined 40 current Masters students on a tour of the Leeds guided bus routes, and enjoyed a visit to the two major ITS research facilities.

STAFF CHANGES

Dr Stephane Hess, formerly of Imperial College, joined ITS as Principal Research Fellow in Discrete Choice Modelling and also holds a Leverhulme Early Career Development Fellowship. Dr Liliya Chernyavs'ka joined ITS as a Research Fellow from the IEFE Centre for Research on Energy and Environmental Economics, Bocconi University Milan. Dr Shujie Shen also joined as a Research Fellow after completing her PhD at the School of Management, University of Surrey. Dr Joyce Dargay was appointed as Chair of Transport Econometrics.

Staff leaving this year included Dr Anil Namdeo, Senior Research Fellow, to take up a post as Senior Lecturer at the University of Newcastle. Dr Agachai Sumalee left his part-time post to become Assistant Professor, Hong Kong Polytechnic University. Liz Dell, the long serving Institute Administrator, became Personal Assistant to Professor Jane Francis, Dean of the Faculty of Environment. Julie Hipkin was promoted to Institute Administrator and Stephen Drechsler left to join Bradford University.
Professor Peter Mackie and Professor Chris Nash both retired from full-time posts in October 2008, but continue as part-time Research Professors. A series of events took place to mark their outstanding contributions over many years to ITS, the University and the wider transport community.

OVERSEAS LINKS AND ACTIVITIES

Professor Mark Wardman and **Dr Jeremy Toner** delivered a Stated Preference short course at the National Cheng Kung University in Tainan, Taiwan. Presentations were also given at Tainan University and National Chiao Tung University in Taipei. The trip concluded with meetings with the Taiwanese Department for Transport and leading consultancies. Following on from this, **Dr Frank Lai** visited eight transport organisations in Taiwan to disseminate results from research projects, with a view to future research collaborations and student exchanges. The organisations included the leading universities, Taipei City Government, the Institute of Transportation and the Department of Transport.

Dr Richard Connors continues to collaborate with Shoichiro Nakayama, Kanazawa University, Japan and with Agachai Sumalee, Hong Kong Polytechnic University.

Dr Paul Timms maintains a number of informal links with various academic and non-academic partners in South East Asia and Latin America. Of particular importance is the link with the Mekong Regional Studies Institute at the University of Ubon Ratchathani in Thailand. This is based around research into sustainable city planning in the Mekong Region (Thailand, Vietnam, Laos and Cambodia), concentrating particularly upon pedestrian and cycling issues.

Dr Miles Tight completed the Translink project which was undertaken jointly with KTH in Sweden, the University of MARA in Malaysia and the University of Indonesia. The final project conference took place in July 2008 in Malaysia at which Dr Paul Timms, Dr Nick Marler and Dr Tight contributed papers.

Dr Stephane Hess was appointed as senior technical advisor by Resource Systems Group Inc., of Vermont, USA. He visited the Institute of Transport and Logistics Studies at the University of Sydney, where he is a visiting research scholar. In July 2008 he taught at a summer school on discrete choice modelling organised by the University of Bologna, involving amongst others Kenneth Train (UC Berkeley), Riccardo Scarpa (Waikato, New Zealand), John Rose (University of Sydney) and Michel Bierlaire (EPFL Lausanne, Switzerland). He also participated in an OECD round table on 'Airline Competition, Systems Of Airports And Intermodal Connections', Paris, September 2008.

Professor Chris Nash is a Visiting Professor at University College Molde, Norway, a Research Professor at DIW in Berlin and a visiting researcher at VTI in Stockholm. Professor Nash visited China twice, presenting the results of his work on Chinese rail investment and the social costs of transport to a seminar of Chinese experts and speaking at an international seminar on urban rail.

Professor Tony May spoke, with **Dr Miles Tight**, at a British Council invited seminar in Milan on reducing the impact of urban transport on climate change. He gave an invited address to the Asian Development Bank in Manila on the development of the Decision-Makers' Guidebook for sustainable urban transport and also visited the Vietnam University of Transport and Communications to discuss future collaboration in teaching and research.

Dr Haibo Chen is an honorary professor at Beijing Jiaotong University and Central South University, and a council member of The Transport Systems Engineering Committee of the Systems Engineering Society of China. Dr Chen was invited to deliver a keynote speech on environmental and health effects of traffic emissions at the 6th International Conference on Traffic and Transportation Studies in Nanning, China, 5-7th August 2008.

Professor Oliver Carsten was an invited speaker at the SHRP2 (Strategic Highway Research Program 2) Safety Research Symposium in Washington, D.C., in July 2008.

Professor Joyce Dargay is collaborating with Petros Vythoulkas (Technical University of Athens) and Akli Berri (INRETS) on a comparative study of car ownership and transport expenditures, and with Jos van Ommeren (Free University, Amsterdam) on commuting.

Jeff Turner has joined ITS as a visiting lecturer. Jeff is currently manager of the DfID-funded African Community Access Programme. He will be the main contributor to the ITS module on Transport in Development and will strengthen ITS's range of developing country contacts.

STAFF NEWS

Dr Chandra Balijepalli presented a research paper on Modelling The Choice Of Car Parks In Urban Areas at the 87th Annual Meeting of the Transportation Research Board (TRB), Washington D.C. He also served as one of the referees at the International Symposium on Dynamic Traffic Assignment (DTA) in Belgium, besides presenting his research jointly with Professor David Watling on Analysing Time Dependent Marginal Travel Times as part of DTA modelling.

Dr Richard Batley continued on the 'Innovative

Methods' Programme Committee of the European Transport Conference (ETC), as well as joining the Academic Committee for the International Choice Modelling Conference and the Editorial Advisory Board for the Journal of Choice Modelling.

Professor Peter Bonsall was appointed as expert advisor to the Scottish Government's Smarter Choices Smarter Places Programme (SCSPP). He gave an invited presentation to a Public Policy Seminar jointly hosted by ESRC and the Technology Strategy Board (TSB). Professor Bonsall also attended the annual TRB conference and made two invited presentations ('Particular Problems To Be Overcome When Seeking Data On Sustainable Travel Behaviour' and 'Surveys In The Context Of Sustainability And User Adaptation'). His membership of the TRB committee on Telecommunication and Travel was reconfirmed. His presentation to the TSB-ESRC seminar on the Informed Personal Traveller was published by ESRC under the title 'How Can Technology Influence Travel Choice?' and featured in EPSRC's Christmas message.

Professor Oliver Carsten gave the annual Westminster Lecture on Transport Safety, organised by the Parliamentary Advisory Council on Transport Safety (PACTS). Entitled 'Technology: Curse Or Cure?', the lecture included recent results from field trials of Intelligent Speed Adaptation (ISA)

Dr Haibo Chen serves on the editorial board for two international journals: Journal of Transportation Systems Engineering and Information Technology, and Journal of Railway Science and Engineering.

Dr Liliya Chernyavs'ka contributed to the study 'Central Repository For The Low Intensity Radioactive Waste: Analysis Of Costs', F.Gulli, L.Chernyavs'ka for SOGIN (Italy), December 2008.

Professor Joyce Dargay has been invited to participate in 'DfT Modelling Friends', which will review and advise the major update of DfT transport modelling work being taken forward through the Department's Forecasting, Modelling and Data Steering Group, particularly in the light of the Eddington and Stern agendas. She presented papers at the AET and a COST355 meeting in Annecy, France. She was responsible for the chapter on personal transport choice, in an OECD report on household behaviour and the environment and provided expert advice to the Energy Efficiency Commission in Sweden on the effects of taxation policy on energy efficiency.

Professor Gerard De Jong gave invited lectures at the University of Amsterdam and the University of Antwerp and was a member of PhD committees at the Delft University of Technology and the VU University Amsterdam. He was an invited member of the expert panel on car ownership (London) and Chair of plenary sessions at the ETC 2008. He was also invited as a member of the referee panel for the OECD report on reliability of surface transport networks.

Dr Paul Firmin was invited to conduct an on-the-move interview on the opening day of the M606/M62 High Occupancy Vehicle Lane (the first HOV lane on a motorway in the UK) for BBC Radio Leeds. Taru Jain, Dr Paul Firmin and Dr Gyeng-Chul Kim gave a presentation on 'Personal Rapid Transit: A Step Towards Successful Implementation Of An Innovative Alternative To The Automobile'. Presented at the Intelligent Public Transport Systems: The Passenger Experience & Multi Modal Mobility Conference, Intertraffic - Amsterdam, 2- 3rd April 2008.

Dr Tony Fowkes gave an invited presentation at an 'Option Values Seminar', at DfT on 4th November 2008. In Brussels later that month he presented a keynote address at the Adam Smith Institute & Marketforce's 4th Annual Conference 'The Future Of Rail Freight In Europe'. He was interviewed about the effect of petrol prices on car traffic for BBC Radio 5 Live and was quoted on the BBC News website feature 'Is Your Journey Really Necessary?' Dr Fowkes has also been awarded a contract by Transport for London to provide peer review advice regarding freight modelling.

Dr Susan Grant-Muller acted as expert advisor to LNEC (Portugal) on the appraisal of sites for the new Lisbon airport. She presented a paper at the Air Transport Research Society Conference held in Athens 7-9th July 2008 and attended the launch event of the European Transport Research Review (Springer Verlag) on 10th December 2008 in Lyon. She is acting as an associate editor for the journal with responsibility for Policy and Economics streams.

Dr Astrid Guehnemann gave a live interview on BBC North in February 2008 on Air Transport And Climate Change, on the occasion of Jet2's 5th anniversary. She participated as expert in the CCC transport workshop 22nd July 2008 in London and the launch of UNEP's Green Economy initiative 1-3rd December 2008, Geneva.

Dr Helen Harwatt won the prestigious Young Researcher Prize, awarded by the International Transport Forum. She presented her winning paper 'Reducing Carbon Emissions From Personal Road Transport Through The Application Of A Tradable Carbon Permit Scheme: Empirical Findings And Policy Implications From The UK' at the Forum in Leipzig.

Dr Frances Hodgson gave a presentation on 'Structures Of Encounterability: Space, Place, Path And Identities', and a workshop for the ESRC National Centre for Research Methods, Real Life Methods node training workshop 'Bringing Together Qualitative And Quantitative Data', on 9th May 2008.

Hamish Jamson's promotion to Principal Research Fellow has been confirmed.
He was a member of the Scientific Committee for the 2008 Driving Simulation Conference – Asia Pacific, held at the Graduate School of Automotive Engineering, Kookmin University, Korea, 10-12th September 2008.

Dr Samantha Jamson secured a prestigious Dorothy Hodgkin Postgraduate Award, co funded by Jaguar Cars and EPSRC. Part of a scheme to bring outstanding talent from developing countries to the UK, this will provide funding for a new PhD student within the Safety Research Group. In collaboration with Dr Frank Lai, she was also awarded an ESRC/Scottish Government Studentship to assess the Efficiency of the Driver Improvement Scheme in Scotland. She attended the 21st ICTCT Workshop (International Cooperation on Theories and Concepts in Traffic Safety) in Riga. Together with colleagues in the Safety Group, she authored a DfT report on the 'Interaction Between Speed Choice And Road Environment'.

Daniel Johnson continues his work for the ETC Freight and Logistics Program committee and presented on Regional Productivity Differentials at the conference.

Dr Ann Jopson joined the advisory group for a DEFRA project on 'Unlocking Habits To Enable Pro-Environmental Behaviours'.

Andrew Koh won the Best Paper by a Junior Researcher Award at the 3rd Kuhmo Conference organised by the Free University of Amsterdam (3-4th July 2008) for his paper with Dr Simon Shepherd on 'Tolling, Capacity Selection And Equilibrium Problems With Equilibrium Constraints'.

Dr Ronghui Liu was a Member of Scientific Committee of International Symposium of Transport Simulation, held in Gold Coast, August 2008 and a Member of the TRAIL International Review Committee for Congress 'TRAIL In Perspective', October 2008, Rotterdam. Dr Liu co-organised the Workshop on Artificial Transportation Systems and Simulation (ATSS) held during the 11th International IEEE Conference on Intelligent Transportation Systems, October 2008, Beijing. Subsequently, Dr Liu was appointed by IEEE Transaction on ITS as a Guest Editor for a special issue on ATSS.

Professor Mike Maher was made Emeritus Professor in the Transport Research Institute at Napier University, and was invited to be a member of the organising committee for the IMA 'Mathematics In Transport' conference to be held in 2010. He continues to be a member of the Editorial Advisory Board for Transportation Research B, and Associate Editor for Networks and Spatial Economics.

Dr Greg Marsden continues in his role as a member of the Independent Transport Commission and member of the Sustainable Development Panel. He is now a member of the TRB ABC30 Performance Measurement Committee and co-chair of the Research Sub-Committee. Invited presentations during the year included a presentation to the British Retail Consortium's

Sustainable Freight Conference entitled 'Road Congestion And Road Pricing', the COST Action 356 Seminar 'Towards The Definition Of A Measurable Environmentally Sustainable Transport' in Oslo and presentations at the Danish Technical University near Copenhagen and VTI Stockholm on 'Good Practice In The Exploitation Of Innovative Strategies In Sustainable Urban Transport'.

Bryan Matthews provided advice to the European Disability Forum and to the UK Equality and Human Rights Commission in relation to Access To Transport For Disabled People. In May 2008 he was invited to write an article for the Parliamentary Monitor – the principal publication distributed to UK parliamentarians – commenting on the Transport Select Committee's Report On Ticketing And Concessionary Fares Arrangements; published in the June 2008 edition. In December 2008 he was nominated and accepted as a member of the Universities' Transport Study Group Executive Committee, a position he will hold for 3 years.

Professor Tony May continued in his role as President of the World Conference on Transport Research Society. In this role he joined the International Affairs Committee of the US TRB, contributed to the inaugural meeting of the International Transport Forum in Leipzig, and the 13th CODATU conference in Ho Chi Minh City. Early in the year he organised two workshops, in London and Brussels, to present the results of the four year DISTILLATE research programme, which has developed a tool-kit of 18 products to help cities introduce sustainable transport strategies. Subsequently he gave the 2008 regional lecture of the Royal Academy of Engineering in Sheffield, in which he reviewed the barriers to implementing such strategies, and the ways in which they could be overcome.

Dr Dave Milne was invited to give a presentation entitled 'Can Road User Charging Be Acceptable?' to a regional meeting of the Institution of Highways & Transportation (IHT).

Dr Gordon Mitchell continues to sit on the steering group for the Yorks and Humber branch of the Institute of Environmental Management and Assessment, and joined the management board of the water@leeds group, created in 2008 to further the development of water research at the University.

Frank Montgomery continued as a member of the Education Board and Council of IHT, a member of the Joint Board of Moderators, and external examiner for the MSc Transportation Planning and Engineering programme at Southampton University. He also spent a week in Rwanda exploring teaching links.

Professor Chris Nash spoke on track access charges at the Railcalc workshop in Brussels on 15th February 2008 and at the UIC World Congress on High Speed Rail in Amsterdam on 17th March 2008. He gave a presentation on European rail reform at a conference on that subject at the University of Dresden on 21st February 2008. During April 2008 he spoke at a conference in Greifswald on the Future Of Public Transport, and at a workshop on rail regulation in Florence. He also gave a seminar on British Experience Of Public Transport Privatisation at VTI in Stockholm on 8th October 2008. Professor Nash has been appointed Specialist Advisor to the House of Commons Transport Committee for its investigation into road user charging and taxation.

Dong Ngoduy presented papers at TRB (Washington D.C.), AATT (Athens) and HKSTS (Hong Kong) conferences.

Matthew Page addressed the Darlington Local Motion conference on 'Factors Influencing Walking And Cycling Levels' on 2nd April 2008 reporting on ITS' Cycling And Walking Modelling research.

Dr Karl Ropkins presented an invited lecture, 'Real Time Mobile Monitoring Of Emissions' at the Royal Society of Chemistry Automation and Analytical Management Group Conference Air Analysis – out of the laboratory and into the field (25th May 2008, Teddington) and one lecture, 'Evaluation Of A Remote Sensing System 'Dirty Emitter' Measurement' at 18th CRC On-Road Vehicle Emissions Workshop (31st March – 2nd April 2008, San Diego). He also attended the by-invitation UK Local Authorities Beacons Low Emission Group consultation seminar for the Beacon's Low Emission Strategies Best Practice Guidance (13th November 2008, London).

Dr Simon Shepherd gave an invited talk on 'The Use Of Long Run Cost Functions In Toll And Capacity Optimisation' to staff at the Hong Kong Polytechnic University.

Jeremy Shires was promoted to Senior Research Fellow. He was also appointed Survey Manager with responsibility for the strategic development of market research within ITS.

Dr Andrew Smith and **Professor Chris Nash** were invited to present their research on franchising to the CILT (UK) Strategic Rail Forum in London on 16th January 2008. Dr Smith, Professor Nash and Phill Wheat were invited to present their research on franchising and train operating company efficiency trends to the Owner Group Forum – Quarterly Discussion Group for Train Operators, run by First Economics, on 14th March 2008. Dr Smith presented his work on rail efficiency modelling (train operating companies and Network Rail) to the Chartered Institute of Logistics and Transport (CILT) in October 2008. Dr Smith also carried out an international benchmarking econometric study to inform the Office of Rail Regulation's efficiency determination as part of the 2008 Periodic Review of Network Rail's finances. The results of his study were published in two parts, in June 2008 and October 2008.

Damian Stantchev successfully completed his PhD in Transport and Logistics from the University of Huddersfield (UK) on 'The Contribution Of Logistics In Improving The Competitiveness Of The Yorkshire And The Humber Economy In The European Marketplace'.

Dr James Tate undertook a 4-month research placement at the Technical University of Graz (TUG), Austria. He worked with the Institute for Internal Combustion Engines and Thermodynamics (FVT), a leading vehicle emission research and consultancy group in the EU, which run extensive light and heavy duty vehicle emission testing programmes. At the end of the research placement he was invited to be a Visiting Research Fellow at TUG. He also accepted the invitation to join the Scientific Committee of the International 'Transport And Air Pollution' Graz Conference.

Dr Miles Tight presented a paper, written in conjunction with Dr Helen Harwatt and Dr Paul Timms, at a Symposium on 'Transport And Climate Change: Status, Impacts And Future Prospects' at the Fraunhofer Institute in Karlsruhe in November 2008. Dr Tight and Professor Chris Nash were invited to participate in the OECD/IT Research Round Table on the Costs And Effectiveness Of Policies To Reduce Vehicle Emissions in Paris on 31st January – 1st February 2008. In February 2008 Dr Tight and Professor Tony May spoke at an invited seminar in Milan, organised by the British Council, on reducing the impact of urban transport on climate change.

Dr Paul Timms chaired the Concluding Session at the TRANSLINK Final Conference 'Developing Transport Research In South East Asia' in Kuala Lumpur, July 2008.

Visiting Professor Tom van Vuren advised the East Midlands Regional Assembly on the definition and procurement of an appropriate transport modelling solution to support their Regional Spatial Strategy. He acted as member of the Peer Review Group For The Development Of A Land Use And Transport Interaction Model For Transport For London. He also continues on the Editorial Advisory Board for Transportation. In March 2008 he chaired a national seminar on Passive Safety at the ICE in London. Later that month he presented on Modelling Reliability at a DfT organised national conference on transport appraisal. He organised the 3rd Annual Transport Modelling Forum in Birmingham in June 2008 followed by his presentation in July 2008 on Data And Transport Modelling at the Innovits Workshop on Transport Modelling, ITS and Grid Computing. Professor van Vuren continues in his role as Chairman of the Board of Directors of the Association for European Transport. In that capacity he gave the opening speech at the ETC at the Leeuwenhorst Conference Centre in the Netherlands on 5th October 2008.

Professor Wardman was appointed to the editorial advisory board of Transportation and the Journal of Choice Modelling and served as advisor to Network Rail on their high speed rail project. He authored or co-authored eight papers at the European Transport Conference and also gave a paper at the

Air Transport Research Society Annual Conference in Athens.

VISITORS

Academic visitors during 2008 included Professor William Young, Monash University, Australia; Dr Jinyi Guo, Beijing Jiatong University, China; Marta Sanchez Borras, Technical University of Catalonia, Spain and Eric Violette, CETE Normandie-Centre DESGI, France.
Continuing visiting appointments are Dr Min-Keong Chong, National University of Singapore; Dr Shoichiro Nakayama, Graduate School of Natural Science and Technology Kanazawa University, Japan; Dr John Parkin, Bolton Institute; Dr Derek Quinn, Gateshead City Council; Jonathan Tyler, Passenger Transport Networks; Professor Tom van Vuren, Mott MacDonald.
Professor Ken Gwilliam bade a final farewell to ITS during 2008. His contribution to ITS over several decades as Director and more recently as Visiting Professor was honoured at a special event.

PHDS AWARDED

Twelve PhDs were awarded in 2008: Robert Bain, 'Privately Financed Roads In Britain - A Policy Assessment'; Hazel Baslington, 'Healthy Travel And Child Socialisation: Policy Implications For Social And Cultural Change'; Pelle Envall, 'Accessibility Planning: A Chimera?'; Xu Hao, 'Evaluation Of Benefits And Effectiveness Of Smart Cards For Public Transport'; Helen Harwatt, 'Tradable Carbon Permits: Their Potential To Reduce CO2 Emissions From The Transport Sector'; Fumio Kurosaki, 'An Analysis Of Vertical Separation Of Railways'; James Laird, 'Modelling The Economic Impact Of Transport Projects In Sparse Networks And Peripheral Regions'; Hedi H Maurer, 'Development Of An Integrated Model For Estimating Emissions From Freight Transport'; Manoj Singh, 'Competition In Intermodal Rail Transport: The Case Of Indian Railways'; Nigel Tapley, 'Nonlinearities In Discrete Choice Attributes: A Study Of Transport Related Choices'; Fitsum Teklu, 'A Markov Process Model For Capacity-Constrained Transit Assignment'; Sotiros Thanos, 'Valuation Of Aircraft Noise Annoyance: A Comparison Of Approaches In The Context Of Airport Relocation'.

RESEARCH STUDENTS

In addition to those awarded degrees in 2008, the research students registered and their research topics were: Muhamad Adnan, 'Traffic Network Modeling Within Activity Based Paradigm'; Zahara Batool, 'Aberrant Driving Behavior And Attituded Towards Road Safety In Pakistan'; Ofelia Betancor, 'Pricing Externalities In Air Transport Markets: A Case Study Of Madrid Barjas Airport'; Anzir Boodoo, 'Walking As An Integral Part Of Sustainable Transport Policy'; Simon Brown, 'Customer Optimised Integrated Asset Management'; Anna Clark, 'Optimal Congestion Pricing Schemes Including Heterogeneous Users And Time Of Day Variability'; Kaushali Dave, 'Applying Multicriteria Equation Fuzzy Logic In Choice Modelling'; James Fox, 'Temporal Transferability Of Mode Choice Models'; Agha Faisal Habib Pathan, 'Traveller Choice Of Information Sources'; Daryl Hibberd, 'The Effects Of Distraction On Driver Behaviour'; Nurul Hidayati, 'Traffic Modelling: Transport Data Collection And Statistics'; James Jackson, 'Appraisal Methods For Railways Servicing Periphial Areas'; Sanjay Jamuar, 'Evaluation Of Car Park Policies'; Sabariah Jemali, 'Decision Making Process For LRT Schemes In Malaysia'; Charlotte Kelly, 'An Investigation Into The Effects Of Moving House On People's Mobility Levels'; Andrew Koh, 'Particle Swarm Optimisation For Transport Planning'; Georgios Kountouriotis, 'Perception, Action And Cognition During Driving'; Anthony Magee, 'Modelling Passenger Demand For Rail Services'; Daniel Mcgehee, 'The Biodynamics Of Pre-Impact Bracing: Towards Smart Airbags And Smarter Dummies'; Rico Merkhert, 'Towards The Efficient Organisation In Europe - A Transaction Cost Perspective'; Helen Muir, 'The Influence Of Area And Person Deprivation On Pedestrian Casualties'; John Nellthorp, 'Transport Investment, Pricing And Use Of Resources' Guido Paglione, 'Urban Distribution Centre: A New Methodolodgy To Assess The Policy Support'; Rahman Pilvar, 'Investigation Into Road And Rail Alignment Optimisation Techniques'; Fayyaz Qadir, 'Incorporating Reliability Into Network Modelling And Policy Analysis'; Janos Szabo, 'Extreme Value Theory And Air Pollution'; Nikolaos Thomopoulos, 'Incorporating Regional Equity Concerns In Appraisal Of Large Transport Infrastructure Projects'; Phillip Wheat, 'Application (And Development Of) Cost Modelling And Efficiency Methods To Transport Problems'; Noor Zaitun Yahaya, 'Temporal And Spatial Variations Of Ultra-Fine Particles In The Urban Environment'.

CONFERENCE ATTENDANCE

The following international and national conferences were attended by ITS staff members in 2008:

10th International Conference on Applications of Advanced Technologies in Transportation:
attended by Dong Ngoduy.
13th CODATU Conference, Ho Chi Minh City:
attended by Tony May.
13th International Conference of Hong Kong Society for Transportation Studies:
attended by Simon Shepherd.
18th CRC On-Road Vehicle Emissions Workshop, San Diego, California:
attended by Karl Ropkins.
2008 Driving Simulation Conference:
attended by Hamish Jamson.
3rd Kuhmo Conference:
attended by Andrew Koh.
4th International Conference on Traffic & Transport Psychology, Washington:
attended by Kathryn Chorlton, Samantha Jamson and Oliver Carsten.
4th Workshop in Discrete Modelling:
attended by Nicolas Ibanez.
6th International Conference on Traffic & Transportation Studies, Nanning, China:
attended by Haibo Chen.
6th UK Transport Practitioners Annual Meeting, Reading:
attended by Greg Marsden.
8th International Conference on Survey Methods:
attended by Peter Bonsall.
Action on Climate Change: a Role for Transport:
attended by Helen Harwatt.
Adam Smith Institute & Market Forces 4th Annual Conference on Railfreight in Europe:
attended by Dan Johnson and Tony Fowkes.
ADB Transport Forum Manila, Philippines:
attended by Tony May.
ATRS Conference (Air Transport Research Society, Athens):
attended by Mark Wardman, Susan Grant-Muller and Dong Ngoduy.
British Retail Consortium's Sustainable Freight Consortium:
attended by Greg Marsden.
Conference on the Future of Public Transport, Greifswald, Germany:
attended by Chris Nash.
Darlington Local Motion Conference:
attended by Matthew Page.
Delivering Infrastructure Improvements Workshop, Belfast:
attended by Chris Nash.
European Consortium for Mathematics in Industry:
attended by Paul Goodman.
European Rail Reform Conference, University of Dresden:
attended by Chris Nash.
European Transport Conference:
attended by Dan Johnson, David Watling, Gerard de Jong, Joyce Dargay, Mark Wardman, Nicolas Ibanez, Phani Chintakayala, Richard Batley, Ronghui Liu, Stephane Hess Tom van Vuren, Tony Fowkes.
Evidence Based Policy Making Conference, Amsterdam:
attended by Gerard de Jong.
Human Factors & Ergonomics Society Annual Meeting, NE:
attended by Yvonne Barnard.
Human Factors & Ergonomics Society Europe Chapter Annual Meeting:
attended by Natasha Merat and Oliver Carsten.
HUMANIST Conference on Human Centred Design for ITS, Lyon, France:
attended by Yvonne Barnard.
ICTCT Conference, Riga:
attended by Samantha Jamson.
Intelligent Public Transport Systems: The Passenger Experience & Multi Modal Mobility Conference:
attended by Paul Firmin.
International IEEE Intelligent Transportation Systems:
attended by Ronghui Liu.
International Modelling Choice Conference:
attended by Richard Batley.
International Transport Forum:
attended by Helen Harwatt and Tony May.
Modelling Automated Technologies within a

Strategic Transport Model:
attended by Simon Shepherd.
New Approach to Appraisal , DfT National Conference:
attended by Tom Van Vuren.
North American Productivity Workshop, New York:
attended by Andrew Smith and Phillip Wheat.
Options for Britain Conference, Cambridge:
attended by Chris Nash.
OR50 York:
attended by Simon Shepherd.
Owner Group Forum - Quarterly Discussion Group for Train Operators, First Economics:
attended by Chris Nash.
PACTS 'Beyond 2010' Conference:
attended by Oliver Carsten.
Rail Access Charges, Brussels - Final Project Conference:
attended by Chris Nash.
Rail Regulation Workshop, Florence:
attended by Chris Nash.
Railcalc Workshop, Brussels:
attended by Chris Nash.
Royal Geographical Society Annual Conference, London:
attended by Greg Marsden.
Royal Society of Chemistry Automation & Analytical Management Group Conference:
attended by Karl Ropkins.
Seminar, Stockholm Transport Research Centre:
attended by Chris Nash.
SHRP2 (Strategic Highway Research Program 2) Safety Research Symposium, Washington, D.C.:
attended by Oliver Carsten.
TRANSLINK Final Project Conference:
attended by Miles Tight, Nick Marler and Paul Timms.
Transport & Air Pollution, Graz Conference:
attended by James Tate.
Transportation Research Board:
attended by Dong Ngoduy, Lucy Lu, Peter Bonsall and Tony May.
UIC World Congress on High Speed Rail, Amsterdam:
attended by Chris Nash.
UK Committee on Climate Change Transport Workshop:
attended by Astrid Guehnemann.
UK Systems Dynamics:
attended by Simon Shepherd.
UNEP Launch Meeting of the Green Economy Initiative:
attended by Astrid Guehnemann.
Universities Transport Study Group:
attended by Helen Muir, Dan Johnson, David Watling, Fayyaz Mahmmod Qadir, Greg Marsden, Joyce Dargay, Manoj Singh, Mike Maher, Nicolas Ibanez, Richard Connors.
Urban Rail Conference, Beijing:
attended by Chris Nash.
Urban Rail Symposium, China:
attended by Chris Nash.
Vervoersplanologisch Speurwerk, Santpoort (NL):
attended by Gerard de Jong.
Workshop involving Senior Researchers and Government Officials, China:
attended by Chris Nash.
World Conference on Transport Research Society:
attended by Astrid Guehnemann, Miles Tight and Tony May.

RESEARCH PROJECTS

SAFETY

Field operational test support action (FESTA)
Grant Holder(s): *S Jamson*
Investigator(s): *O Carsten, K Chorlton, F Lai, Y Barnard, J Nellthorp*
Funded by: *European Commission*
Dates: *November 2007-May 2008*
Research Group: *SAFETY*

Abstract
Field operational testing is widely recognised as an effective instrument to test new transport technologies in the real world. Previous experience in Europe, US, and Japan has shown that field trials can raise awareness, collect real data, and enhance the take-up of ICT solutions. The European approach to field operational testing has been developed in 2008 in the FESTA project in the form of a handbook of good practice. The handbook provides applicants to subsequent ICT calls, as far as possible (given the range of near-market ICT systems), practical guidance to allow them to develop compelling FOT projects that address the Commission's desire for an integrated and coordinated program of research. The FESTA handbook covers issues concerning all aspects of the time-line and administration of an FOT, such that advice will be provided regarding aspects from needs analysis at the commencement of an FOT all the way through to the integration of the acquired data and estimation of socio-economic benefits at the end.

Low cost engineering measures to reduce fatigue-related accidents
Grant Holder(s): *N Merat*
Collaborating Partners: *TMS Consultancy, North Yorkshire Police*
Funded by: *Highways Agency*
Dates: *October 2007- December 2008*
Research Group: *SAFETY*

This project was managed by Parsons Brinckerhoff and used the UoLDS to investigate the potential for low-cost, road-based, engineering measures to act as alerting features in an otherwise monotonous driving environment. This study was part of a wider field of research intended to contribute to improving safety on the highway network and was a natural progression from previous research commissioned by the HA with regard to driver fatigue. Three 'treatments' were implemented in the driving simulator: chevron road-surface markings, transverse-carriageway rumble strips and variable message signs and results showed some evidence of an alerting effect by all three of the treatments. Whilst the alerting effect appeared to be relatively weak and potentially quite short-lived, the data suggest that there may well be potential for any of the novel alerts to be deployed in the field in a known fatigue-related accident area.

EASY
Grant Holder(s): *O Carsten*
Investigator(s): *AH Jamson, A Horrobin, N Merat, F Lai, Y Barnard, R Auckland*
Funded by: *EPSRC*
Dates: *January 2007 - April 2010*
Research Group: *SAFETY*

Abstract
This project is examining how some of the new Advanced Driver Assistance Systems, that are envisaged by the car manufacturers, will affect safety. Currently the most advanced assistance system on the market is Adaptive Cruise Control (ACC) which automates the task of car following. ACC is particularly designed for motorways, but can also be used on rural and even urban roads. It has deliberate limitations, in that it cannot deal with situations requiring severe braking and that the ACC radar cannot detect stationary objects. The car manufacturers plan to extend the capability of ACC so that it can handle most forward situations. They also plan to provide lane keeping systems which will automate lateral control of a vehicle (i.e. steering), once again particularly for motorway driving. The combination of longitudinal and lateral control will provide a situation in which a large part of the driving task is automated. As a consequence, there is a risk that drivers will no longer feel a need to pay attention to the road and traffic environment, and therefore may not be aware of impending risk. They may also lose track of when manual control has been resumed, e.g. on exiting from the motorway, and therefore be slower in responding when required to brake or steer. This project is conducting a systematic evaluation of driver's performance and safety awareness as they experience increasingly greater automation of the driving task. The major tool for this work is the new driving simulator at the University of Leeds, which has a complex motion base to provide gravitational feel to the drivers. The initial set of experiments will be designed to identify any safety related problems that result from driving in a semi-automated vehicle. A wide range of drivers will be used, with the major factors in their selection being age, gender and trust in automation. Having identified the problems, and a second set of experiments will focus on solutions to those problems, i.e. on ways in which driver alertness and awareness can be enhanced. The results are intended to provide guidance to those governmental organizations that are planning to use new driver assistance systems to increase road capacity and safety. They are also intended to lead to better design of new products by the vehicle manufacturers.

Speed limit adherence and its effect on road safety and climate change
Grant Holder(s): *O Carsten*
Investigator(s): *F Lai, K Chorlton, S Jamson, N Walid, D Carslaw, P Goodman, S Hess, M Wardman*
Funded by: *CfIT and the Motorists' Forum*
Dates: *July 2007- June 2008*
Research Group: *SAFETY*

Abstract
The overall aim of this project was to predict the effects of a voluntary Intelligent Speed Adaption (ISA) system across the entire road network in terms of reducing deaths and injuries on the UK roads and reducing carbon emissions, other pollutants and fuel consumption. Five elements in the study are identified: 1) Estimating the reductions in the number of people killed or injured (both seriously and slightly) in road accidents that would arise through raising the levels of adherence to speed limits through the introduction of a voluntary ISA system; 2) Estimating the reductions in carbon emissions, other pollutants (including noise) and fuel consumption that would arise through the introduction of a voluntary ISA system; 3) Assessing the other benefits e.g. journey time reliability that would also arise through the introduction of a voluntary ISA system; 4) Carrying out cost-benefit analyses based on the cost of introducing an ISA system compared to accident savings and reduced carbon emissions, other pollutants and fuel consumption; 5) Making recommendations on how a greater take-up of ISA on a voluntary basis can be encouraged.

Conflict Study
Grant Holder(s): *O Carsten*
Funded by: *Highways Agency*
Dates: *May 2007- July 2008*
Research Group: *SAFETY*

Abstract
The primary objective was to investigate whether there are relationships between accidents recorded and conflicts observed at junctions and other features on the highways network, such that the conflict data could be used to identify improvement schemes. Also to study the potential impact of Conflict Study techniques as part of Route Management to: supplement the accident data used in an Accident Investigation and Prevention (AIP) approach; monitor effectiveness of a safety improvement scheme after implementation; establish a 'level of risk' where safety problems are reported, but without significant accident data. The aims are to: establish reliable relationships between accident and conflict data, pertinent to different situations on the HA network; widen the scope of previous work to consider specific junction types and links, not just priority junctions ; compare actual accident data with prediction using conflict study and SafeNET software, which is now applicable to rural as well as urban roads; test the use of Conflict Study techniques and determine suitability for use by Road Safety Engineers for assessing safety at specific locations on the network; develop guidelines on the use and methodology applicable for Conflict Studies.

Adaptive Integrated Driver-vehicle InterfacE (AIDE)
Grant Holder(s): *O Carsten*
Investigator(s): *S Jamson, N Merat, F Lai, AH Jamson*
Funded by: *EU Sixth Framework*
Dates: *March 2004 - April 2008*
Research Group: *SAFETY*
URL: http://www.aide-eu.org/

Abstract
The general objective of the AIDE Integrated Project was to generate the knowledge and develop methodologies and human-machine interface technologies required for safe and efficient integration of ADAS, IVIS and nomad devices into the driving environment. Specifically, the IP designed, developed and tested a generic Adaptive Integrated Driver-vehicle InterfacE (AIDE) that employed innovative concepts and technologies in order to: (1) maximise the efficiency, and hence the safety benefits, of advanced driver assistance systems, (2) minimise the level of workload and distraction imposed by in-vehicle information systems and nomad devices and (3) enable the potential benefits of new in-vehicle technologies and nomad devices in terms of mobility and comfort, without compromising safety. The AIDE concept was implemented, demonstrated and validated in three different test vehicles: a city car, a luxury car and a heavy truck. ITS was involved in two sub-projects of AIDE: SP1, Behavioural Effects and Driver-Vehicle-Environment Modelling; and SP2, Evaluation and Assessment Methodology.

Assessing post-court disposal courses
Grant Holder(s): *K ChorIton*
Investigator(s): *E Wincup, M Conner*
Funded by: *DfT*
Dates: *October 2008 - June 2009*
Research Group: *SAFETY*

Abstract
The Road Safety Act 2006 makes legal provision for four post-court educational interventions for serious traffic offenders. These four offences include speeding, careless and inconsiderate driving, failure to comply with traffic signs and use of a special road contrary to scheme or regulation. For each of these offences the courses will be offered to (1) people who attend court for the said offences and for which the court, having decided that an x number of points and a y amount of fine is imposed, puts the total endorsements on the driver's license at between 7 and 11 points, and (2) people who attend court for the said offences and for which the court decided that they will be disqualified from driving for at least one year. In anticipation of the possibility of these new courses, the Department for Transport has commissioned this research to provide a detailed exploration of the person characteristics of likely course attendees. Person characteristics data will be collected through a series of in-depth interviews and focus groups with current offenders in order to allow a precise definition of likely course attendees in terms of their: demographic, driving and criminal history; cognitions and motivation; personality traits; and social influences.

EuroFOT
Grant Holder(s): *O Carsten*
Investigator(s): *S Jamson, F Lai, K ChorIton*
Funded by: *EU*
Dates: *May 2008 - August 2011*
Research Group: *SAFETY*

Abstract
The EuroFOT project aims to demonstrate the effectiveness and encourage the deployment of Intelligent Vehicle Systems on European roads. Extensive Field Operational Tests can be used to validate the effectiveness of these systems and functions for a safer, cleaner and more efficient transport in a real environment. The aims of the project are to analyse driver behaviour and acceptability, to analyse and assess the impact of these functions using real data and to improve awareness about the potential of intelligent transport systems and create socio economic acceptance. A key concept of EuroFOT is that the systems will be used by drivers in their own vehicles. EuroFOT will experiment systems that are already in the market or sufficiently mature to represent a commercial application, such as lane departure warning and forward collision warning.

FOT-NET
Grant Holder(s): *O Carsten*
Investigator(s): *Y Barnard, S Jamson, F Lai, K ChorIton*
Funded by: *EU via ERTICO*
Dates: *June 2008 - August 2010*
Research Group: *SAFETY*

Abstract
The FOT-Net project aims to gather European and international stakeholders in a strategic networking platform to present results of Field Operational Tests (FOTs), identify and discuss common working items and promote a common approach for FOTs-the FESTA methodology. FOT-Net is a Specific Support Action funded by the European Commission DG Information Society and Media under the Seventh Framework Programme.

NETWORK MODELLING

A Theoretical Approach to Deriving Practical Road Pricing Cordons with Investment in Capacity
Grant Holder(s): *Anthony May, David Watling.*
PhD Studentship: *Anna Clark*
Investigator(s): *Agachai Sumalee, Andrew Koh*,
Project Manager: *Simon Shepherd*
Funded by: *EPSRC*
Dates: *September 2005 – September 2008*
Research Group: *NETWORK MODELLING*

Our research set out with the aim to develop algorithms for use with models of towns and cities which aim to produce better designs for both cordon based charging systems and investments in road capacity. First we developed a short-cut approach to cordon design which made use of a theoretically optimal set of tolls, showing the planner where the most congested routes should or could be tolled. This approach was adopted by the DfT and was subsequently applied in various city studies into road pricing. On the more theoretical side we also developed an algorithm which can optimise the tolls and capacities in a network for a

given set of pre-defined links (Koh et al, 2009). This was compared to a theoretical benchmark where all links may be tolled and capacities changed. The derivation of this benchmark was made easy by the use of self-financing principles and long run cost functions within the traditional assignment process to very much simplify the problem in a manner similar to the altered cost function approach used for toll only system optimal assignment. This was done in collaboration with Prof Erik Verhoef from FUA (Verhoef et al, Forthcoming).

We then looked at the problem of toll competition between operators in a network and solved the traditional Nash equilibrium using the our adapted algorithms within a diagonalisation approach and compared it to another Linear Programming approach. Our prize winning paper (Koh and Shepherd, 2008) found that these approaches whilst successful could not guarantee the global optimal solution when we considered a more collusive game between operators. This we remedied by implementing a heuristic based on Particle Swarm Optimisation again applied with success and reported in (Koh, 2008). We then studied alternative forms of competition demonstrating that in most cases of toll competition a 'leader' would not actually wish to lead when alternative routes have similar characteristics (Shepherd and Sumalee, 2008). Here we also demonstrated that where a toll operator wishes to lead the game society would be worse off and vice versa.

Alongside our research Clark's PhD studentship extended behavioural models and algorithms to deal with differences which exist between drivers in the general population whilst accounting for departure time choices to avoid congestion or charges. This is a difficult mathematical problem to solve and apply to a general network model but enhancing the model in this way has provided useful insights into a more realistic benchmark for potential welfare gains. (Clark et al, 2009).

ECONOMICS AND BEHAVIOURAL MODELLING

CATRIN (Cost Allocation of Transport Infrastructure)
Grant Holder(s): C Nash
Investigator(s): *A Smith, J Toner, P Wheat, P Abrantes*
Funded by: *EU FP6*
Dates: *May 2007- April 2009*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*

Abstract
This is a follow up project to the GRACE project, again involving a collaboration of European partners. The focus of the research is to develop further the methodologies for estimating marginal infrastructure costs across modes, and to generate new results. The work is ultimately aimed at informing transport pricing, and will draw on the most recent theoretical microeconomic literature in respect of pricing rules (e.g. game theoretic approaches). A particular focus in CATRIN will be improved knowledge regarding differential pricing for different vehicle / locomotive types. The work involves both economic and engineering input (see http://www.catrin-eu.org/index.php).

Bus Soft Factors
Grant Holder(s): *J Shires*
Investigator(s): *M Wardman, J Dargay*
Funded by: *DfT*
Dates: *March 2007-December 2008*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*

Abstract
An investigation into how bus soft factors impact upon demand for bus travel for both bus users and non-users. Unlike previous studies in this area the focus is not purely on the valuation of specific soft factors but on how they combine to influence bus demand and how they interact with factors such as income and lifestyle choices. A large amount of qualitative work has been carried out to date including focus groups which has helped inform the design of a series of stated preference experiments, the experiments are due to be piloted in spring 2008.

Green Logistics
Grant Holder(s): *A Whiteing*
Investigator(s): *AS Fowkes, S Shen, DH Johnson, D Stantchev*
Funded by: *EPSRC*
Dates: *June 2006-June 2010*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*
URL: www.greenlogistics.org

Abstract
This four year research project into the sustainability of logistics systems and supply chains is being undertaken by a consortium of six UK universities supported and steered by a range of project partners including the Department for Transport, Transport for London and CILT(UK). The main focus is on the use of freight transport within the supply chain, and how this can be made more environmentally sustainable. The project consists of a set of twelve interlinked work modules, investigating (inter alia) opportunities for modal shift, problems associated with logistics operations in urban areas, the environmental sustainability of reverse logistics, the sustainability of home delivery operations and opportunities for improved scheduling of road freight. A major aim of the project is to develop enhanced methodologies for research into sustainable logistics, to assist in future policy formulation in this important field. www.greenlogistics.org

IMPRINT-NET
Grant Holder(s): *C Nash*
Investigator(s): *P Wheat, J Laird, B Matthews*
Funded by: *European Commission*
Dates: *July 2005-July 2008*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*

Abstract
The aim of Imprint-net was to improve the links between research, policy and practice in the field of infrastructure charging. To further this, ITS was responsible for organising a series of meetings of expert groups involving researchers, policy makers and people from the relevant industry concerning inter urban road infrastructure charging, rail infrastructure charging and financing and the use of revenue. These groups heard presentations concerning both research and practice on the issues and debated their implications for policy. The final report summarises these discussions and recommendations.

DIFFERENT - User Reaction and Efficient Differentiation of Charges and Tolls.
Investigator(s): *P Bonsall, B Matthews, B Menaz, P Wickham, W Lythgoe, D Johnson*
Funded by: *EU DGTEN*
Dates: *May 2005 - June 2008*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*
URL:
http://www.napier.ac.uk/depts/different/home.htm

Abstract
This project investigated the use of differentiated tolls and charges to internalise the externalities of transport. The likely success of differentiated tolls and charges was studied from a theoretical and empirical perspective with a focus on the implications that differentiation has for revenues and behavioural response. The empirical analysis was based on literature and case studies of freight and passenger transport by road, rail, water and air. New data (Stated Preference and Revealed Preference) was collected and new modelling work was conducted. ITS's main roles in this project were to contribute to the psychological investigation of behavioural response, to lead the work on rail charges, to design the SP survey, and to study the implications of co-implementation of urban and inter-urban charges. The new modeling work conducted by ITS included development of an elasticity-driven spreadsheet model to explore model choices under different externality-recovery pricing regimes, use of a network model to explore the performance of pricing regimes with different degrees of differentiation by road type, and a psychologically-oriented study of respondent's willingness to engage with complex charge structures. ITS led , or contributed to, several delivereables which can be downloaded from the project website at: www.different-project.eu , and a number of conference papers have been based on the work conducted in the project.

Rail Research UK
Grant Holder(s): *Chris Nash, Mark Wardman*
Investigator(s): *Daniel Johnson, Andrew Smith, Phillip Wheat*
Funded by: *EPSRC*
Dates: *April 2003 to July 2009*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*

Rail Research UK is the British universities rail

research group; it is led by the Universities of Birmingham and Southampton and we are also working with Imperial College London and Loughborough University on these projects.

We are currently involved in two projects. The first is on systems costs modeling, where we have undertaken econometric modeling of train operating costs, and tested a range of hypothesis about the way in which policy on franchising, including franchise length, geographical coverage and the willingness to renegotiate influence costs. As part of this first project we will also be looking at the structure of the industry and its impacts on incentives to develop new technology, and have been working with Birmingham and Imperial College to develop a methodology for testing the impact of new technology on rail system costs. The second project concerns the value of reliability, where we are building on previous work for the Department for Transport and have carried out new survey work.

Real Productivity Differentials
Grant Holder(s): *J Dargay*
Investigator(s): *D Johnson, P Mackie, J Laird*
Funded by: *DfT*
Dates: *March 2007- April 2008*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*

Abstract
The Department for Transport is looking to improve their currently used approach for estimating real productivity differentials at a sub-regional level by groups of industries in the UK. The productivity differentials are used to measure the benefits of employment opportunities relocating to more productive areas. The relevant productivity differentials for this purpose are those arising purely from the features of location, particularly agglomeration effects. For this reason it is necessary to isolate these effects from productivity differentials related to differences in workforce and firm characteristics. The primary objective of the research is to identify the real productivity differentials by area and industrial sector after controlling for human capital attributes (such as age, experience, qualifiecations), occupation, job characteristics and firm characteristics.

Concessionary Fares Lot 5 DfT Framework JT
Grant Holder(s): *J Toner*
Investigator(s): *J Shires, J Nellthorp, B Menaz, P Wheat, J Dargay, P Mackie, A Smith*
Funded by: *DfT*
Dates: *October 2008- December 2009*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*

Abstract
Reimbursement of bus operators for concessionary travel has become increasingly important with the introduction of free local travel for older and disabled people in April 2006, and the extension to free national travel on all local bus services in England from April 2008. The aim of this research project is to provide the Department for Transport with reliable, robust, evidence-based estimates of the key elements of reimbursement, together with an assessment of the feasibility of, and the evidence necessary to support, a more deterministic approach to reimbursement. There are a number of specific issues the research will need to cover including the shape of demand curves, fare- and service-level elasticities, passholder trip rates and additional marginal and capacity costs. To that end, three main areas of modelling and analysis activity are planned: a package on the story to date, including the underpinning economics, and extracting what we can from experience; a package on demand estimation; and a package on the supply side, dealing with costs and counterfactual industry structure/conduct/performance. To feed this modelling and analysis, a substantial data collection exercise is being undertaken, covering both extraction of data from existing data sets and the creation of new data through primary fieldwork.

Bus Demand Elasticities
Grant Holder(s): *P Abrantes*
Funded by: *Department of Transport*
Dates: *November 2008 – December 2008*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*

Abstract
ITS advised MVA and the Department for Transport on suitable elasticities, values of time and quality attributes to feed into a national Quality Bus Model. Parameters were suggested at a high level of disaggregation based on available evidence and expert judgement.

Advances in modelling human choice behaviour
Grant Holder(s): *S Hess*
Funded by: *Leverhulme Trust*
Dates: *October 2008- December 2010*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*

Abstract
Almost without exception, human activity can be dcomposed into individual choices. The mathematical representation/modelling of such choices had been one of the most active topics of theoretical research in the field of economics over recent years. The contribution of choice modelling to wider science was recognised in the award of the Nobel prize in Economics to Daniel McFadden in 2000 and to Daniel Kahneman in 2002. Choice models are used across many different disciplines, from small scale studies looking at students' choices of course modules, to industrial studies looking at thte potential interest in new mobile phone handsets and to large scale cost benefit analyses looking at the economic, environmental and societal sustainability of new infrastructure developments. While there have been impressive advancements in modelling methodology, there are still major gaps between how individual people make decisions and how these decisions are represented in a mathimatical model. At the same time, there is a prevailing and growing gap between theory and practice, with many real-world applications relying on inferior methodology that can lead to biased results. Both the theoretical shortcoings and the slow uptake of advanced methodology are worrying. Indeed, with the increasing reliance on choice models to quide important decisions, it is crucial to quarantee the reliability of the modelling work as any bias can have significant financial, environmental and societal effects. the aim of this fellowship is therfore two-fold. On the theoretical side, I aim to advance the state of the art by reconciling modelled choice behaviour with actual human behaviour, while on the applied side, I am to bridge the gap between theory and practice by making advanced methodology accessible for large scale real world studies.

UK TRAM (formerly Meta Analysis)
Grant Holder(s): *D Johnson*
Investigator(s): *M Wardman, P Abrantes*
Funded by: *DfT*
Dates: *September 2008 - January 2009*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*

Abstract
The primary aim of this study to identify the importance of various factors which comprise a measure of quality of journey experience on Trams, making it distinct from other modes, and which are not captured in time or cost related estimated parameters from Stated Preference (SP) or Revealed Preference (RP) exercises.

Bus Fare Simplification
Grant Holder(s): *J Shires*
Investigator(s): *P Bonsall, S Hess*
Funded by: *DfT*
Dates: *June 2008 – November 2008*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*

Abstract
A combination of Stated Choice and Stated Intentions methodologies were employed to ascertain non-frequent bus user's valuations of simplified fare structures and the impact they might have upon trip making. Two types of simplification were estimated: (1) A move towards zonal fares; and (2) A move towards flat fares; with the latter being valued more highly. Zonal fares were found to be more effective in non-metropolitan areas where zonal boundaries can be more clearly identified.

Impact of Environmental Awareness on Rail Demand
Grant Holder(s): *J Shires*
Investigator(s): *G Marsden, A Jopson, H Muir*
Funded by: *Association of Train Operatin Companies*
Dates: *January 2008 – December 2008*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*

Abstract
This project examined the impact of environmental awareness upon the demand for rail travel. A

number of methodologies, including TPB analysis, stated choice experiments and stated intentions questioning were employed to develop baseline demand and what value people placed on reductions in CO2. The results will be available in 2009.

Transport Reform
Grant Holder(s): *P Wheat*
Investigator(s): *P Mackie, B Matthews*
Funded by: *Department for Regional Development North Ireland via FGS*
Dates: *August 2008 – December 2008*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*

Abstract
The project evaluates various options for introducing organizational reforms to the public transport system in Northern Ireland. ITS has been involved in benchmarking the performance of the present publicly owned public transport operator against suitable comparators.

Examinations of the Rail Industry
Grant Holder(s): *C Nash*
Investigator(s): *A Smith*
Funded by: *National Audit*
Dates: *March 2008*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*

Abstract
A brief review of issues concerning value for money on the rail industry for the national audit office.

National Investment Policy for Railway Construction
Grant Holder(s): *C Nash*
Investigator(s): *J Shires*
Funded by: *The World Bank Accounts*
Dates: *April 2008 – September 2008*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*

Abstract
The aim of this project was to examine European practice in the planning and financing of rail investment, draw lessons from it for China, and present and discuss these with a panel of experts in Beijing.

Social Cost of Railway Transport
Grant Holder(s): *C Nash*
Investigator(s): *J Shires*
Funded by: *Ministry of Railways*
Dates: *April 2008 – September 2008*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*

Abstract
The aim of this project is to examine practice in estimating social costs of rail and competing modes of transport in Europe, and how such estimates are used in transport policy. It will proceed to make estimates of social costs for the principle modes of inter-urban feight and passenger transport in China, and make recommendations on their application. It includes organising a study tour of European Ministires and rail organisations for delegates from the chinese ministry of railways.

SLM Values
Grant Holder(s): *C Nash*
Funded by: *DfT*
Dates: *June 2008*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*

Abstract
This was a peer review of their update of values used for the benefits of relieving the road system of heavy goods vehicles through the Freight Grants Schemes for rail and water transport.

Long Distance Scoping Study
Grant Holder(s): *J Dargay*
Investigator(s): *M Wardman*
Funded by: *Independent Transport Commission*
Dates: *January 2008- March 2008*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*

Abstract
This study, financed by the Independent Transport Commission, examines the feasibility of developing a aggregate model to forecast longer distance domestic travel by coach, air, rail and car in Great Britain. It presents a descriptive analysis of long distance travel in GB today and how it has developed over the past decades. The study proposes a dynamic, elasticity-driven system of equations for the four modes, based own- and cross-elasticities encompassing cost, time, quality and service separately, as well as characteristics of the population. Demand is defined as passenger kilometres by mode. Given the characteristics of long distance travel arising from the descriptive analysis, it is suggested to model four journey purposes separately: visiting friends and relatives, holidays, leisure day trips and business trips; 2 distance bands: below and above 150 miles separately. The drivers of long distance travel are discussed and a review of existing evidence based on aggregate and disaggregate studies is presented. An inventory of existing data sources is presented and new survey requirements are discussed.

ITC Study
Grant Holder(s): *J Dargay*
Investigator(s): *S Clark, D Johnson, B Menaz, M Wardman*
Funded by: I*ndpendent Transport Commission*
Dates: *July 2008-June 2009*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*

Abstract
The object of this study, financed by the Independent Transport Commission, is to develop a model to forecast longer distance domestic travel by coach, air, rail and car in Great Britain. The model will consider future developments in transport supply as well as changes in economic, demographic and social factors, individuals' attitudes and a range of policy measures. Both quantitative and qualitative factors affecting the individual's transport decisions will be considered in the demand projections, so that the effects of a wide-range of economic and non-economic policy measures and marketing strategies can be analysed. The forecasting model is a dynamic, elasticity driven system of equations for the four modes, based own- and cross-elasticities encompassing cost, time, quality and service separately, as well as characteristics of the population. Demand is defined as passenger kilometres by mode, and consideration is given to five journey purposes: visiting friends and relatives, holidays, leisure day trips, business trips and commuting. Trips below and above 150 miles are considered separately, since air will only be a reasonable option for trips farther than this distance. The base values will be determined by data from the National Travel Survey (NTS). The elasticities to drive the model will be based on a combination of existing evidence and new empirical estimates. The new estimates are based on econometric analysis of aggregate data for rail, air, car and coach travel, NTS data for the years 1995-2006 and data obtained from a new survey of passengers at coach stations, airports, onboard trains and at motorway service areas. The survey contains a stated preference element to provide information on diversion factors which will contribute to calculating cross-elasticities and provides other information not available in the NTS. The model will be in the form of a user-friendly computer program, which will allow the examination of the effects of various scenarios concerning key variables and assumptions. Provision will also be made to easily alter essential input parameters (such as elasticities etc.), so that sensitivity tests can be carried out, and new research results incorporated swiftly.

Road User Charging
Grant Holder(s): *M Wardman*
Investigator(s): *P Bonsall, S Hess*
Funded by: *Transport for London*
Dates: *April 2008 – May 2008*
Research Group: *ECONOMICS AND BEHAVIOURAL MODELLING*

Abstract
TfL invited ITS to conduct an advisory study into how it might explore the public acceptability and behavioural effectiveness of possible developments of road user charging in London, with a particular emphasis on the practical issues involved in applying research results in forecasting and appraisal. A review was conducted of the considerable amount of research that has been conducted over the past 20 years in the area of public acceptability of road pricing. On the basis of this review, recommendations were made on approaches to adopt in any further research in this area relevant to London. In addition to building upon current best practice, two novel extensions to previous work were recommended. One was to compare user charging with alternative policies whilst the other would search for the 'tipping point'

where respondents who would not currently support user charging are asked at what future level of congestion it would become acceptable. The review of effectiveness went beyond conventional behavioural modelling which examines how travellers might respond to interventions in the context of a specific trip, such as the journey work or a shopping trip, to more complex behavioural responses, particularly in response to innovative marketing initiatives. Recommendations were provided as to how best research might be progressed in this area and how the results would be applied in practice.

TRANSPORT AND ENVIRONMENT

Mobile Environmental Sensing System Across a Grid Environment (MESSAGE)
Grant Holder(s): *H Chen*
Investigator(s): *Consortium of five universities led by John Polak (Imperial College London), Margaret Bell (Newcastle), Phil Blythe (Newcastle), Haibo Chen (Leeds), Peter Landshoff (Cambridge), Michael McDonald (Southampton).*
Funded by: *EPSRC, DfT*
Dates: *October 2006 - September 2009*
Research Group: *TRANSPORT AND ENVIRONMENT*

Abstract
The project involves developing new techniques for collecting, managing, interpreting and modelling data on environmental quality and its relationship to transport. It aims to bring about a step-change improvement in the data and analysis methods available for the measurement and management of traffic pollution. More specifically, it will address key scientific challenges in the field of transport and environmental monitoring, using data derived from transportable sensors which can measure local environmental factors such as pollutants from vehicles, and develop a flexible and reusable sensor and communications infrastructure to support a wide range of scientific, policy-related and commercial uses and applications for the resultant data (e.g. pollution at the level of the individual) and to demonstrate the operation and utility of this infrastructure in a range of case study applications (e.g. mounted on a fleet of buses and individuals as they move about). The Leeds and Newcastle team will be responsible for the deployment and validation of a new class of low cost wireless sensors in and around the road environment in Gateshead, Headingley and Leicester, and the use of the data from the sensors to improve the calibration and validation of existing emissions and dispersion models
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MoSeS: Modelling and Simulation for e-Social Science
Grant Holder(s): *M Birkin*
Investigator(s): *H Chen, J Xu, J Keen, M Clarke, P Rees*
Funded by: *ESRC*
Dates: *April 2005 - September 2008*
Research Group: Research Group: *TRANSPORT AND ENVIRONMENT*
URL:
http://www.ncess.ac.uk/research/nodes/MoSeS/

Abstract
The overall vision which underpins this project is the creation of a Research Centre with a focus on Modelling and Simulation as a Node on the UK e-social science programme. The objectives of the project are directed towards a research programme which is centred on the representation of the entire UK population as individuals and households, together with a package of modelling tools which allows specific research and policy questions to be addressed. More specifically, it aims to create a synthetic model of the whole UK population; demonstrate a forecasting capability for the population model; and develop case study applications with specific reference to transport, business and health, including evaluation of wider-ranging policy scenarios. For the transport application, two scenarios have been identified and developed using system dynamics and transport planning models, respectively. The first scenario is to build a macroscopic model at a regional level (and the national level if possible) to evaluate the transport impact (e.g. journey time, journey distance and environmental factors) caused by the changes of population distribution, family composition and car ownership etc, and to assess how such changes influence the development of sustainable transport systems in the future. The second scenario is to establish a mesoscopic transport analytical model at a city-wide scale, which can be used to analyse the change of travel behaviour (e.g. demand, trip distribution, modal split and assignment) as a result of changes in population distribution, business and healthcare services.

Future Urban Technologies Undertaking Research to Enhance Sustainability (FUTURES)
Grant Holder(s): *M Bell*
Investigator(s): *P Goodman*
Funded by: *EPSRC*
Dates: *April 2004 – March 2009*
Research Group: *TRANSPORT AND ENVIRONMENT*
URL: http://www.sue-futures.org

Abstract
The information age and technological advances are presenting substantial opportunities (and threats) concerning the design of our transport services, management of our transport systems, design and operation of vehicle fleets and the way in which people gain access and participate in society. The FUTURES programme is concerned with research into the role of new technologies in progressing towards more sustainable urban mobility. The research programme focuses on people, systems and vehicles as key elements which, in combination, result in the levels and patterns of urban mobility and the associated economic, social and environmental impacts. FUTURES involves academic expertise drawn from four universities (Southampton, UWE, Newcastle and Leeds) and spans engineering, technology, environmental science and social science. ITS is working in conjunction with the Energy and Resources Research Institute (ERRI) at Leeds to study the impact of select new vehicle technologies on the environment and provide enhanced modelling capabilities for these.

4M - SUE II
Grant Holder(s): *P Goodman*
Investigator(s): *K Ropkins*
Funded by: *EPSRC*
Dates: *January 2008-December 2011*
Research Group: *TRANSPORT AND ENVIRONMENT*

Abstract
Recently published findings make the case for reductions in anthropogenic greenhouse gas concentrations both conclusive and urgent. UK Government policies are attempting to encourage the uptake of low or zero-carbon technologies. However, technological advances and penetration are unlikely to account for reductions in carbon emissions of the order being proposed – behavioural and land-use changes affecting the use of buildings and transport networks will also be required, alongside biological sequestration and better waste management. Unfortunately current tools available to authorities and planners to track and manage such processes are somewhat inadequate. The 4M project seeks to address this issue by building a complete carbon footprint for the City of Leicester UK, using a bottom-up process, alongside appropriate tool development, so that the relative magnitudes and trade offs between competing carbon management strategies may be studied and their effects on the lifestyles of the cities' inhabitants explored.

TRANSPORT POLICY

M42 ATM
Grant holder(s): *Susan Grant-Muller*
Investigator(s): *Peter Bonsall, Haibo Chen, James Tate*
Funded by: *Highways Agency through Mott Macdonald*
Dates: *September 2002 – August 2008*
Research Group: *TRANSPORT POLICY*

The Active Traffic Management project for Junctions 3A-7 of the M42 is one of the Highways Agency's largest and most significant implementation of ATM to date. ITS has advised on the assessment approach for establishing whether operational regimes have had a significant impact. During the period the hard shoulder running phase was introduced, the sixth month and twelve month reports have been issued and the ITS contribution to the project has now been completed.

MIME (Market Based Impact Mitigation for the Environment)
Grant Holder(s): *M Tight*
Investigator(s): *A Guehnemann, C Kelly, H Harwatt, R Connors, L Chernyavs'ka*
Funded by: *Boeing Research and Technology Europe, Spain; SINTEF, Norway; QINETIQ, UK;*

Eurocontrol Experimental Centre; ENV-ISA, France; Technical University of Munich, Germany.
Dates: *August 2007- July 2010*
Research Group: *TRANSPORT POLICY*

Abstract
Airlines and airports will likely face an increasing number of noise impact constraints in the future. There are already at least 128 airports worldwide with some type of noise surcharges, and the situation that the air transport industry faces regarding noise-related environmental constraints on future growth is very grave. As has been shown in other industries, there are conditions under which a market-based mechanism using transferable permits can be used to provide improved control over environmental impacts, and at the same time, allow efficient business operations. MIME is aimed at discovering whether, and how, such mechanisms can be used to improve environmental noise control in air transport.

Assessing Sensitiveness to Transport (ASSET)
Grant Holder(s): *A Gühnemann*
Investigator(s): *M Kimble, M Tight, A. Koh. L. Chernyavs'ka*
Funded by: *EU Sixth Framework*
Dates: *April 2007- October 2009*
Research Group: *TRANSPORT POLICY*
URL: http://www.asset-eu.org

Abstract
The aim of the project is to develop the scientific and methodological capabilities to implement European policies aiming at balancing the protection of environmentally Sensitive Areas (SA) with the provision of an efficient transport system. Although the concept of sensitive areas has been repeatedly evoked in the context of EU transport policies, there is to date no scientific and no political agreement on a definition, nor is there an agreed approach to address the specific concerns associated to transport related SA (TSA). Therefore, the first part of the project has provided a set of sensitiveness criteria to identify TSA and apply these in a mapping of TSAs across the EU, allowing for the identification and prioritisation of critical sustainability issues geared to the development of the Trans-European Transport Networks (TEN-T). The second part of the project was led by ITS and concentrated on analysing policy instruments with regard to their applicability to different categories of TSA and the identification of adequate policy packages with a focus on market-based instruments. The proposed methodology and the policy instruments are currently being assessed in detail in 10 case studies covering (i) mountainous areas, (ii) urban/metropolitan areas, (iii) natural/protected areas, and (iv) coastal areas, as well as different modes, types of traffic and geographical situations. ITS is carrying out a case study in the Trans-Pennine region dealing with a situation where the protection of a natural protected area conflicts with the protection of the population. Finally, policy and operational guidelines for TSA will be developed, notably building on the cross site evaluation of the case studies. The project involves a consortium of 11 partners in 9 countries, thus covering all relevant disciplines (natural scientists, economists, transport policy, social policy experts) and a wide geographical scope in Europe.

Sustainability Of Land Use and Transport In Outer NeighbourhoodS (SOLUTIONS)
Grant Holder(s): *G Mitchell*
Investigator(s): *A Namdeo, S Gawthorpe*
Funded by: *EPSRC*
Dates: *April 2004 –September 2008*
Research Group: *TRANSPORT POLICY*
URL: http://www.suburbansolutions.ac.uk/

Abstract
The principle research questions that SOLUTIONS intends to answer are how far, and by what means, can towns and cities be planned so they are socially inclusive, economically efficient and environmentally sustainable. In particular, how should peri-urban areas, where most people live, be developed to accommodate current high growth levels in the most sustainable manner? To answer these questions an integrated case study approach is being undertaken in partnership with local planning authorities and a wide range of other stakeholders. The research examines the interaction between strategic (whole city) and local (neighbourhood) levels using land use transport interaction modelling and neighbourhood design methods. Alternative designs of land use dispositions and transport configurations are being combined to form distinct archetypes of development at strategic and local scales. The alternatives are being analysed through a combination of quantitative and qualitative procedures to estimate the likely outcome in terms of people's opportunities and behaviour. The resulting forecasts provide the basis for an assessment that quantifies criteria that encompass the impacts in the economic efficiency of the area studied, its social equity implications, and environmental sustainability. A series of development scenarios were first agreed with stakeholders, and then implemented within a land use transport interaction (LUTI) model for London and the Wider SE region and the Tyne and Wear region (using MEPLAN models). An evaluation framework has also been developed in consultation with stakeholders, and a series of model tools have been refined to allow interface with the LUTI model. For some of the evaluation criteria new assessment procedures have developed (e.g. a regional building stock energy model based on commercial floorspace and residential dwelling type profiles). These tools have been applied to the LUTI model outputs for the London study (Tyne and Wear in prep.) to provide a sustainability appraisal of the options. The final outputs of the research will include a report describing the effect of alternative growth accommodation strategies (trend, compaction, dispersal, new towns and edge expansion) on sustainability of two UK regions.

TRKC
Grant Holder(s): *A May*
Investigator(s): *B Menaz, D Stantchev, A Whiteing, P Timms*
Funded by: *European Commission*
Dates: *February 2007- August 2010*
Research Group: *TRANSPORT POLICY*

Abstract
The Transport Research Knowledge Centre (TRKC) is a European project funded under the 6th RTD Framework Programme and is a follow-up of EXTRA (1999-2001) and EXTR@Web (2002-2006). The aim of the project is to promote and disseminate the results of transport research activities from the European Research Area to policy-makers, academics, industry and other relevant stakeholders. A web-based information portal available at http://www.transport-research.info/web/index.cfm has been established to provide comprehensive information about on-going and completed transport research programmes and projects, transport events as well as thematic analyses of transport research results and their policy implications.

European Union COST 358: Pedestrians' Quality Needs
Grant Holder(s): *M Tight*
Funded by: *Networking Grant*
Dates: *November 2006 – November 2010*
Research Group: *TRANSPORT POLICY*

Abstract
The main objective of this project is networking and the development of high quality collaborative research proposals in the area of pedestrians quality needs. The study will focus of three perspectives, functionality of the pedestrian environment, perception of that environment by the users and durability. The project aims to provide an essential contribution to systems knowledge of pedestrians' quality needs, thus stimulating structural and functional interventions, policy making and regulation to support an improved pedestrian environment across the EU and other involved countries. The project involves experts in this field from 26 countries in Europe and elsewhere.

CityMobil
Grant Holder(s): *A May*
Investigator(s): *H Muir, C Kelly, S Shepherd, G Marsden, A Guehnemann, R Liu, S Jamson, N Merat*
Funded by: *European Commission*
Dates: *May 2006 - April 2011*
Research Group: *TRANSPORT POLICY*
URL: http://www.citymobil-project.eu/

Abstract
CityMobil involves examining the impacts that new transport technologies (mainly PRT, cybercars and high-tech buses) can have on improving the sustainability of European cities, and how these modes can be integrated into existing transport systems. ITS is involved in four of the five sub-projects, including managing a sub-project to investigate how new technologies would fit into a range of future scenarios. Further work being

undertaken by ITS includes: constructing strategic (MARS) and microsimulation (DRACULA) models to assess the future impacts of new technologies in four European cities; developing and applying a framework for evaluating new modes; aiding the co-ordination of links between CityMobil and the PRT system construction at Heathrow Airport; and using the UoLDS to assess the human factors issues associated with transfer of control between manual driving and full automation.
http://www.citymobil-project.eu/

CURACAO (Coordination of Urban Road User Charging Organisational Issues)
Grant Holder(s): *AD May*
Investigator(s): *D Milne, A Koh*
Funded by: *European Commission*
Dates: *April 2006 –March 2009*
Research Group: *TRANSPORT POLICY*

Abstract
CURACAO is a three year project funded by the European Commission to provide support to cities interested in introducing road pricing schemes. Its overall objective is to promote and support fair and more efficient pricing of road usage in urban areas. CURACAO is not undertaking research itself, but reviewing the results of research and practice and collating these to provide advice to cities related to the questions which they are raising. ITS leads the Scientific Committee, which is producing an annual state of the art report. This report reviews evidence on each of the main issues of concern to cities: policy objectives; design methods and technology; prediction and appraisal; impacts on the economy, equity and the environment; acceptability and transferability. While the report focuses on European findings, the opportunity is being taken to seek expert advice from those involved in road pricing elsewhere in the world.

Transport policy appraisal and the development of a city scale carbon emissions accounting tool.
Grant Holder(s): *M Tight*
Investigator(s): *H Harwatt, P Timms*
Funded by: *Tyndall Centre for CImate Change Research II*
Dates: *April 2006-March 2008*
Research Group: *TRANSPORT POLICY*

Abstract
Our role in this research is to develop an emissions accounting tool which will permit the estimation of carbon emissions from transport activity in London and potentially other cities and regions. The project will assess current and future emissions up to 2050, taking account of projected changes in vehicle use, economic development, demography and land-use. Emissions will be estimated for both a business as usual scenario and simulating the carbon reduction effects of a range of potential policy measures. Emissions from both freight and personal transport will be considered. This research is part of a wider effort looking at the impact of London on climate change (and the impact of climate change on London) more generally and will interact with other aspects of the Tyndall Cities research theme which will be looking at land-use and demographic change, flood risk and economic well-being.

IMPACT (IMplementation Paths for ACTion - towards sustainable mobility)
Grant Holder(s): *M Tight*
Investigator(s): *P Enval, M Kimble, M Tight*
Funded by: *MISTRA*
Dates: *January 2006 – December 2008*
Research Group: *TRANSPORT POLICY*

Abstract
The project started in 2006 and aims to develop models and tools for the support of sustainability oriented decision-making and implementation in the transport sector. The problem, as we see it, is that very few of the good intended solutions are put into practice. IMPACT claims that this is due to the lack of knowledge of implementation processes in relationship to the multi-level and multi-actor governance system of which such policies are a part and multiplicities of actors. The overall IMPACT vision is to determine ways to make it happen. The primary concern of the project is initiatives which are motivated from a climate change perspective, but we are also interested in effects on congestion, other transport externalities with consequences for health and environment, economy and social equity. The project will examine a range of measures from mobility management to transition of fuel and vehicle technologies and will include policy initiatives on a national as well as local levels and consider the effects on both personal travel and freight transport. Our work is looking at a case studies related to the implementation of high level national strategic transport planning in the UK and also the implementation of high quality cycle facilities on the Ørestad region of Copenhagen.

Public Attitudes to Climate Change
Grant Holder(s): *G Marsden*
Investigator(s): *H Watters, M Kimble, A Jopson, M Tight, N Walid, H Muir*
Funded by: *People Science and Policy LTD*
Dates: *December 2006 - June 2008*
Research Group: *TRANSPORT POLICY*

Abstract
The aim of this project was to explore whether the provision of (scientific) information influences travel behavior and if so, to explore whether different social groups are more or less affected by different pieces of information. DfT has three broad objectives: to explore public understanding of, and engagement with, climate change; to identify and explore further the barriers and incentives to behavioral change which could result in reduced impact of personal travel behaviour on climate change; within the above, to explore the role of information provision to implore public awareness, understanding and attitudes towards travel behavior and climate change and potential for influencing behavioral change. The project has now completed its intervention phase which has seen five groups of around 30 people meeting on five separate occasions to discuss climate change, transport and the role of individuals, business and government in tackling the problem. Four travel diaries have been collected across the project period and two psychographic questionnaires.

At the start of the project just over a half of the frequent drivers were willing to reduce their car use and this increased significantly over the course of the project to almost three-quarters. Women frequent drivers were more likely than men to see reductions as practical and they saw themselves as more willing and able to reduce their car use than men. The number of trips taken by participants reduced significantly over the course of the project although the total carbon consumed did not.

The project examined the strength of the relationships between participants' actual travel behaviour, their stated intentions regarding car and van use and their climate change beliefs. Where intentions to decrease car use to reduce climate change existed, they were formed primarily on the basis of whether people felt able to take action and whether they felt a personal responsibility to act to reduce car use for environmental reasons. Taking part in this project strengthened the link between feeling able to take action and feeling a responsibility to take action, suggesting that intentions to reduce car use can be strengthened.

Previous research has suggested that attitudinal measures would be more likely to explain differences in behaviour than socio-demographic variables. Of all the attitudinal variables collected, those who reduced their carbon consumption over the lifetime of the project had significantly greater feelings of personal responsibility for taking action than those who did not, both initially and at the end of the study. Despite this, no significant relationship between strength of intentions to reduce car use and the actual number of car trips was found. This confirms that the relationship between intentions and behaviour is complex. For the majority of people however much they believe they need to change their travel behaviour for the sake of climate change, and actively want to do so, information about climate change and individual contributions alone seems unlikely to achieve substantial carbon reduction.

The project report is available at
http://www.dft.gov.uk/pgr/scienceresearch/social/

Connected Lives
Grant Holder(s): *F Hodgson, N Emmel*
Investigator(s): *A Clark*
Funded by: *ESRC*
Dates: *October 2005 – September 2008*
Research Group: *TRANSPORT POLICY*
URL: http://www.reallifemethods.ac.uk/connected

Abstract
The Connected Lives project is concerned with understanding the interrelations of social networks, mobilities, communities, neighbourhoods and health. The project developed further mobile methods and mixed method spatial analysis using Google Earth. It contributed to the growing understanding of the

relationship of mobilities and social networks through an analysis of the practices of walking, spatial and temporal routinised activities, and the social processes of encounters and the formation of community, identity and belonging. The Connected Lives project is a project of the Real Life Methods node of the ESRC National Centre for Research Methods.

TRANSLINK (Transportation Research Links for Sustainable Development)
Grant Holder(s): *M Tight*
Investigator(s): *N Marler, PTimms,*
Funded by: *EC Asia Link*
Dates: *August 2005 - July 2008*
Research Group: *TRANSPORT POLICY*
URL: http://www.infra.kth.se/ToL/international project/translink/translink.htm

Abstract
The quality of the transport system is a major factor in economic development. Transportation research provides the knowledge, skills and tools to implement efficient transport policies, systems and services. This three year project is a partnership between two European and two South-East Asian universities with the overall aim to promote sustainable urban development in the latter region through development of their human resources. The main target groups are the transport research staff at the Malaysian and Indonesian universities who will be trained in research methodology and supervision. Institutional assistance will also be provided aiming at the creation of a transport PhD programme in their departments. The expected outcome is that the Asian universities will have staff with the skills and experience to develop their research programmes further, to the future benefit of their students, the transport planning profession and sustainable development in their countries.

Policy, Economics and Appraisal in Transport (PEAT)
Grant Holder(s): *S Grant-Muller*
Funded by: *European Commission*
Dates: *September 2004 – August 2008*
Research Group: *TRANSPORT POLICY*

Abstract
The PEAT training site is one of a small number of highly prestigious training sites funded under the EU FP6 Marie Curie training and mobility programme. It provides a comprehensive research training environment covering the theoretical, methodological and contextual research issues within the field of Policy, Economics and Appraisal for the transport network of today and tomorrow. Eight full time scholarships were awarded, each for a 3 year period of study towards PhD at ITS and Fellows are now in the latter stages of their research and training. Two fellows have already been awarded their PhD. In addition to the main work of research, to date, over 50 conference and journal papers have been produced by Fellows and disseminated at a range of international conferences.

DISTILLATE
Grant Holder(s): *AD May*
Investigator(s): *M Page, S Shepherd, G Marsden, A Jopson, C Kelly, J Shires*
Funded by: *EPSRC*
Dates: *April 2004 – March 2008*
Research Group: *TRANSPORT POLICY*
URL: http://www.distillate.ac.uk

Abstract
DISTILLATE was funded under EPSRC's Sustainable Urban Environment programme. Its principal objective was to develop ways of overcoming the barriers to effective development and delivery of sustainable urban transport and land use strategies. It is based on the Scoping Study, which highlighted nine priority research needs, of which seven were funded in the main programme. The seven are understanding the barriers to delivery; generating strategy and scheme options; establishing a set of core indicators and targets; supporting effective collaboration; overcoming financial and other implementation barriers; enhancing predictive models; and improving appraisal methods. These were pursued, in conjunction with 15 local authority partners, through a combination of research and case study trials. A total of 19 products were generated to meet these needs. All results are available on the website: www.distillate.ac.uk , and they have also been included in the UK Department for Transport's Local Transport Planning Network: www.ltpnetwork.gov.uk

Road User Safety and Cycling
Grant Holder(s): *M Tight*
Funded by: *Department of Transport*
Dates: *September 2008 – August 2010*
Research Group: *TRANSPORT POLICY*

Abstract
This project aims to assess a wide range of road user safety issues in relation to cycling in the UK, in particular analysis of cycling activity and collision data, qualitative research with cyclists and other road users, a review of infrastructure provision and a review and analysis of cycle helmet wearing.

VISIONS
Grant Holder(s): *M Tight*
Investigator(s): *P Timms, D Ngoduy, M Kimble, D Watling, A Güehnemann*
Funded by: *EPSRC*
Dates: *October 2008 – September 2011*
Research Group: *TRANSPORT POLICY*

Abstract
This research seeks to examine ways in which more people might be encouraged to walk and cycle in the future, what steps are needed to support this potential increase in walking and cycling and how to improve the experience for those who already use these modes. Walking and cycling can make a considerable contribution to sustainable transport goals, building healthier and more sociable communities and contributing to traffic reduction and lower carbon emissions. The amount of walking and cycling in Britain has declined over the long term and research suggests that there are major obstacles to prevent people from using these modes. There have been many national and local initiatives to promote walking and cycling but without a long term vision and consistent strategy it is difficult to see how a significant change may be achieved. The time is now right to examine the means by which such a fundamental change both in the quantity of walking and cycling, and in the quality of the experience can be achieved, which goes well beyond continuation of existing trends. The work will involve a series of expert workshops to develop visions of alternative futures and also draw in various ways on the experiences of different user groups of the public to ensure that the visions developed are grounded in real experiences. The workshops and other participation events will be used to establish trend breaking views of the future and the key attributes of future conditions which will generate these visions. We will undertake impact assessments to consider the likely costs and benefits of these visions and the potential effects on lifestyle. The work will develop and use innovative methodologies using visualisation software to help users understand how futures might appear, using modelling techniques which examine narrative and storylines to understand how different futures might be attained, and using a range of social research methods to explore how different futures might affect individual lifestyles and society. We will offer people a range of tools that enable them to construct their own versions of the future, and to weave their own stories in and out of expert visions, thus opening up the possibility of a richer and expanded public engagement with the visioning process. This permits a shift from the narrow focus of people's current day decision-making and behavioural and lifestyle choices to a greater focus on the process through which people make decisions and the contextual factors which inform how people choose to live their everyday lives. The value of this project, and the innovative methodologies it adopts, such as the new approach to modelling, is that in this way it opens up the possibilities of a greater understanding of how walking and cycling could change in the future.

Understanding Walking and Cycling
Grant Holder(s): *M Tight*
Investigator(s): *A Jopson, H Harwatt, F Hodgson, S Clark,*
Funded by: *EPSRC*
Dates: *October 2008 – September 2011*
Research Group: *TRANSPORT POLICY*

Abstract
It is widely recognised that an increase in walking and cycling for short journeys in urban areas could significantly reduce traffic congestion, improve the quality of the urban environment, promote improved personal health, and contribute to a reduction in carbon emissions. This is demonstrated by a wide range of policy initiatives by national and local governments, by health authorities and a variety of non-governmental organizations. Recent reviews of research on travel behaviour have emphasised that the ways in which

travel decisions are made remains poorly understood, especially in the context of complex and contingent household travel arrangements. This research seeks to fill this research gap through an in-depth analysis of household decision making with respect to short journeys in urban areas and has two key aims: To develop better understanding of the complex ways in which households and individuals make everyday travel decisions about short trips in urban areas; and to develop a 'toolkit' that helps planners, policy makers and others concerned with promoting more sustainable travel practices in urban areas to target policies and interventions more effectively. The research will adopt a mixed methodology, but with the main emphasis on in-depth qualitative research, and will examine individual, family and household decision making in four different neighbourhoods. Throughout the research the project will engage with a range of stakeholders and potential users, and in the final part of the project will engage potential users with the development of outputs.

Rural Transport
Grant Holder(s): *J Laird*
Investigator(s): *Mackie P*
Funded by: *Scottish Government*
Dates: *November 2008 – April 2009*
Research Group: *TRANSPORT POLICY*

Abstract
This project reviews the latest research and best practice in rural transport economic appraisal. It has a particular focus on wider economic impacts, option values and suppressed demand. James is leading ITS' input in this study.

Proportionate Appraisal
Grant Holder(s): *M Page*
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Abstract
Atkins was invited by the Department for Transport (DfT), in conjunction with the Institute for Transport Studies (University of Leeds) and John Bates Services, to provide a review of appraisal procedures for all types of transport interventions, leading to a generic framework for appraisal and recommendations on revised procedures as appropriate. Specifically, the objectives of the research are to review possible approaches to appraisal for transport interventions and provide recommendations for revised approaches as necessary. Particular emphasis is being given to proportionality for the appraisal of smaller major schemes. This is building upon existing material where possible, and covers modelling, analysis and appraisal of schemes. The research will lead to recommendations on the most appropriate levels of appraisal for major schemes at different cost thresholds, in the context of proportionate appraisal, with due consideration given to consistency issues.

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