Institute for Transport Studies - University of Leeds

ITS UNIVERSITY OF LEEDS

By Dr Susan Grant-Muller

INTRODUCTION

The Institute for Transport Studies (ITS) had a further successful year in 2007 with a significant and diverse body of high quality research commissioned. The international reputation of research at ITS was reflected in a particularly high number of invitations for keynote and invited presentations in Europe and further afield. This was matched by an increasing programme of visits by leading international researchers to ITS. The five research groups at ITS (Traffic Network Modelling, Transport Safety, Economics and Behavioural Modelling, Transport Policy, and Transport and the Environment) have continued to grow in response to the continued high profile of transport on the national and international agendas. For further details, 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 currently maintains two major research facilities, namely the University of Leeds Driving Simulator (UoLDS) and the Instrumented City (IC). Since 1994, driving simulators have been used by researchers at ITS to undertake high quality research into driver behaviour and transport safety. The newly developed, £1m UoLDS, operational since September 2006, allows such research to be performed in accurately controlled and repeatable laboratory conditions. UoLDS is one of most advanced worldwide in a research environment and incorporates an eight degrees of freedom motion system. Only five driving simulators exist worldwide with equivalent or superior motion characteristics. Lateral accelerations are simulated by sliding the whole vehicle cab and dome configuration along a railed gantry. Similarly, the whole gantry slides along tracks to create longitudinal acceleration cues. The 10m long rails and tracks allow 5m of effective travel in each direction. In addition, sustained cues are provided by a standard 2.5t payload, electrically driven hexapod. The motionbase enhances the fidelity of the simulator by proving 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 tremendously valuable. For more information please contact Hamish Jamson, UoLDS Manager (email:A.H.Jamson@its.leeds.ac.uk).

The Instrumented City 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) totalling in excess of £3 million. The 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 study traffic flow and congestion – emission generation – dispersing air flows – atmospheric chemistry - noise and air pollution simultaneously. The unique characteristic of the IC 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 UK 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 Instrumented City 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 Instrumented City 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/. If you are interested in exploring research possibilities, data collection services, equipment hire or simply to find out more, please contact Dr James Tate, IC Manager (email: j.e.tate@its.leeds.ac.uk).

SOFTWARE

The latest version of SATURN, version 10.8, was released to maintained users in April 2008. The release of SATURN v10.8 reflects the ongoing development work to provide both new functionality and enhance the existing product. Some of the new features include procedures to estimate marginal external costs of congestion to support the design of road pricing schemes as well as completion of the new Origin Based Assignment algorithm for Multiple User Classes. Looking ahead over the next 12 months, development continues apace on the Multi-Core version of SATURN (SATURN-MC) that allow users to take advantage of the latest multi-processor desktop PCs coupled with strengthening the links between SATURN and Geographical Information Systems. This ongoing development work will reinforce the SATURN software as the de-facto standard for highway equilibrium assignment within the UK and overseas markets. Also produced by the Institute and distributed by Atkins Highways and Transportation is the DRACULA microsimulation package. 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 was released in spring 2007. For further details of DRACULA please contact Dr Ronghui Liu, Senior Research Fellow (email: r.liu@leeds.ac.uk).

STAFF CHANGES

Pedro Abrantes joined as Lecturer in Public Transport, a former ITS Masters student and Assistant Lecturer at the University of Porto, Portugal. Accent, the market research agency, sponsored a new Research Fellowship; Dr Venkata Phani Chintakayala from the Indian Institute of Technology Kharagpur was appointed as the Accent Fellow in Stated Preference, working jointly for ITS and Accent. Dr Agachai Sumalee, Assistant Professor at Hong Kong Polytechnic University, returned to a part-time position as Senior Research Fellow in Network Analysis and Optimisation. Professor Margaret Bell left ITS to take up a new post as Professor of Transport and the Environment at the University of Newcastle. Dr Catherine Woodham left to take up a new teaching post in Sheffield.

Support Staff Changes

ITS said farewell to Ferri Ghahri-Saremi who, after more than twenty years of dedicated IT support as Network Manager, left to take a well earned retirement. Richard Bettie stepped up to the role of Institute IT Officer. A new Faculty of Environment Research Office was created, led by Sheila Mathison in a new role of Faculty Research Manager. Emma Holden, Gordon Aickin, Angela Jackman and Adrian May were appointed to new roles in that office and Carole Murray as ITS' new Resources Coordinator. Frances Race left ITS to take up a new post in the Nuffield Institute for Health and was replaced by Steven Rowley as Departmental Support Assistant. Other Departmental Support staff changes included Lynn Armistead as Institute Coordinator and Julie Hipkin as Institute Facilitator. Robin Marsh moved into a new role of Marketing and Business Development and Joanne Davies to Student Support Manager and Team Leader for the Student Support Office. Jo Moran took over as Taught Postgraduate Courses Administrator and Callissa Brent moved to a new role as Admissions and CPD Coordinator. David Lewis moved into the Student Support Office as Taught Programmes Assistant.

STAFF NEWS

Pedro Abrantes organised the 1st Public Transport Conference hosted by ITS on 18th October 2007 where he also presented a paper on the Design of Multi-modal Public Transport Networks.

Dr Richard Batley continued on the 'Innovative Methods' Programme Committee of the European Transport Conference (ETC).

Professor Peter Bonsall was a member of the Department for Transport's (DfT) Expert Panel on the effectiveness of Individual Travel Planning (ITP) and acted as external auditor for ITP programmes in Darlington and Peterborough – and for Liverpool's City Centre Movement Strategy. He was the first invited discussant on Economics Nobel Laureate Daniel McFadden's paper on 'The relevance of the social and behavioral sciences to transportation policy and decision-making' at the 11th World Conference on Transport Research (Berkeley, USA).

Dr David Carslaw was invited to talk at an international colloquium on airport air quality help at Manchester Metropolitan University on 12th April 2007 – 'Safeguarding Airport Air Quality: Angles of Approach'. He presented recent work funded by Defra that was carried out together with Karl Ropkins. He was also invited to participate in a workshop organised by the International Civil Aviation Organisation (ICAO) in Montreal, Canada from 29-31st October 2007. The workshop was titled 'Assessing Current Scientific Knowledge, Uncertainties and Gaps Quantifying Climate Change, Noise and Air Quality Aviation Impacts' and the outcomes will be used to help ICAO address the many impacts that aviation has on the environment and in particular help develop methods to consider the inter-dependencies and trade-offs between the different issues.

Professor Oliver Carsten gave the keynote address to the Human Factors and Ergonomics Society Europe Chapter annual conference in Braunschweig, Germany, 24-26th October 2007.

Dr Haibo Chen was appointed as Council Member of the Transport Systems Engineering Committee of the Systems Engineering Society of China commencing from 1st July 2007; Visiting Professor at Central South University, Changsha, China, from 1st May 2007; Member of the International Academic Committee for the Sixth International Conference on Traffic and Transportation Studies, 5-8th August 2008, LanZhou, China. He also hosted a visit by Professor Xiamiao Li from Central South University, China from May to November 2007.

Dr Richard Connors was invited to take up a 3-month position as Visiting Professor at the Centre for Collaborative Research, University of Tokyo. He joined the Applied Methods Committee for the 2008 European Transport Conference and was invited to give a presentation at the 2008 European Consortium for Mathematics in Industry organised by the IMA.

Professor Joyce Dargay was invited to present a paper on her work with the National Travel Survey at the Economic and Social Data Service Government Annual Research Conference on 1st November at the British Academy, and on her work (with Kevin Reilly and Dan Johnson at the University of Leeds) on regional productivity differentials at the VML Quarterly Workshop on Earnings on 26th November at the Office for National Statistics. She also presented a paper entitled 'Car ownership in Greece and UK: a comparison based on pseudo panel analysis' with P. Vythoulkas of the Technical University of Athens at the COST355 meeting in Madrid in May and gave an invited seminar on modelling car ownership and energy use at Surrey Energy Economics Centre at the University of Surrey. Joyce was also invited to participate in the International Transport Forum's Joint Transport Research Centre's Round Table entitled 'Oil Dependence: Is Transport Running Out of Affordable Fuel?' in Paris in November. She was also invited to Stockholm by the Committee on Energy Efficiency in Sweden to advise on econometric estimation of the effects of policy measures on energy efficiency in the transport, residential and industrial sectors in Sweden.

Professor Gerard De Jong gave invited lectures at the University of Amsterdam, University of Antwerp and Post-Academic courses. He was an invited member of the expert panel on car ownership (London) and Chair of plenary sessions at the European Transport Conference 2007.

Dr Tony Fowkes gave a talk on 27th April 2007 at a Department for Transport workshop in London on the basis for 'The Current Treatment of Productive Use of Travel Time Savings'. Dr Fowkes also gave a talk entitled 'The Leeds Freight Transport Model (LEFT) as an example of simple strategic planning models of the future' at the 'Transport Modelling Second Annual Forum' in Birmingham on 20th June 2007.

Dr Susan Grant-Muller stepped down as leader of the Transport Policy Group at the end of 2007 in order to take on the role of Director of Research. She has been appointed as an Associate Editor of the new European Transport Research Review Open Access Journal (ETRR) to be launched by the European Conference of Transport Research Institutes organisation. She has also joined the Association for European Transport's (AET) European Transport Policy and Research Programme Committee.

Dr Astrid Guehnemann gave a presentation at the Second International Conference on Funding Transportation Infrastructure 'Infrastructure funds: Lessons learnt from experiences in European countries and the US' in Leuven, Belgium, 20-21st September 2007.

Helen Harwatt was invited to attend an Expert workshop, led by David Quarmby, as part of the RSA's CarbonLimited project – exploring Personal Carbon Trading (PCT), 14th February 2007.

Frances Hodgson was invited to give a presentation on 'Gender equality in transport' with Jeff Turner (UEL), to Economic and Social Research Council/Royal Statistical Society/Gender Statistics Users Group seminar on 'Developing indicators and official statistics to monitor the new public duty to promote gender equality', on 12th April 2007.

Hamish Jamson was Advisory Committee and Scientific Review Committee Member of the Fourth International Driving Symposium on Human Factors in Driver Assessment, Training and Vehicle Design. Stevenson, Washington, USA, 9-12th July 2007.

Dr Samantha Jamson attended the 20th ICTCT (International Cooperation on Theories and Concepts in Traffic Safety) in Valencia. The aim of ICTCT is to achieve a deeper understanding of problems in the area of traffic safety, to harmonise future research activities and to provide for means for optimal utilisation of research results from different countries. ITS will be hosting ICTCT in October 2009, along with the associated two-day traffic safety course for young researchers.

Dan Johnson joined the 'Freight' Programme Committee of the European Transport Conference.

Andrew Koh was on the Scientific Committee of the IEEE World Congress of Evolutionary Computation 2007. He presented a paper 'Solving Transportation bilevel programs with Differential Evolution'.

James Laird was invited to give a presentation on Option Values in Rural Transport Appraisal to the Highland Rail Partnership meeting on the 4th September 2007.

Dr Ronghui Liu gave an invited seminar, entitled 'the state-of-art in traffic microsimulation modelling', at the Faculty of Transportation, Chang-An University, Xian, China, on 19th April 2007.

Professor Peter Mackie continued as an Eddington 'friend' of the Department for Transport and chaired an expert seminar on NATA-Refresh. In October, he attended the first Round Table of the new Organisation for Economic Cooperation and Development (OECD) International Transport Forum (ex ECMT) in Boston on macro, meso and micro methods of transport infrastructure planning.

Professor Mike Maher joined ITS in February 2007, as Professor of the Mathematical Analysis of Transport Systems. In November/December he made a three-week visit to Hong Kong, funded through the Royal Society international short visits scheme. He spent time at four universities whilst there: HK University of Science & Technology (with Professors Hong Lo and Hai Yang), the Chinese University (Dr Janny Leung), HK University (Professor SC Wong and Dr Becky Loo), and HK Polytechnic University (Professor William Lam and Dr Agachai Sumalee), discussing transport modelling research with staff and research students and giving seminars on his current research. He also attended and presented a paper in a plenary session at the 12th International Conference of the HK Society of Transportation Studies.

Bryan Matthews presented at the 39th Annual Conference of the University Transport Studies Group in January 2007: 'Rail Infrastructure Charging in Europe - Current practices and the latest research'. In October he organised the visit of Professor Ken Small, of the University of California at Irvine, to ITS for a seminar and series of research discussions. Then in December, Bryan organised a high profile international conference in Brussels focused on the findings of GRACE and the future direction of European transport pricing policy.

Dr Greg Marsden was invited to give talks to the Institutions of Highways and Transportation Yorkshire Branch Annual Meeting in October 2007; the British Retail Consortium Sustainable Distribution Conference (February 2008) and the COST356 Action on Towards the Definition of a Measurable Environmentally Sustainable Transport in Oslo. He acted as advisor to the Transport Select Committee Inquiry into the Draft Local Transport Bill and continues to be a member of the Independent Transport Commission and the UK Sustainable Development Panel, contributing evidence on their Aviation consultation.

Professor Tony May presented a paper in Lyon at the end of March on 'The European Policy on Sustainable Transport for Urban Areas'. He was elected President of the World Conference on Transport Research Society at its conference in Berkeley in June, where he presented three papers and led the work of the Special Interest Group on Urban Transport. Tony spent a month in Singapore as SMRT Professor of Transport Policy at Nanyang Technological University in Singapore. He subsequently gave lectures in Takamatsu and Nagoya in Japan, and the second Martin Wachs Distinguished Lecture on Transportation Policy at UCLA.

Dr Natasha Merat was invited to present the results of the AIDE project to the ISO/WG8 group during a workshop held at the UNI ISO offices in Milan. The feasibility of using the Peripheral Detection Task (PDT) as a tool for safety assessment of IVIS and ADAS was discussed at this meeting.

Dr Dave Milne supervised a road-pricing experiment for Channel 4's Dispatches programme – 'Bottleneck Britain'. The programme assessed what a policy of 'pay as you drive' might mean for typical drivers and compared this to people's preconceptions.

Dr Gordon Mitchell was appointed to the regional steering group of the Chartered Institution of Environmental Management and Assessment (IEMA). Invited talks were given on urban diffuse water pollution to the National Water Summit, Olympia Conference Centre, and the UKWIR/DEFRA conference on Potential Solutions to Meet Water Framework Directive Goals; and on environmental forecasting to the ESRC Research Methods Festival, Oxford University.

Frank Montgomery was appointed Chair of IHT (Institute of Highways & Transportation) Education Board, and external examiner for the MSc Transportation Planning & Engineering course at Southampton University.

Dr Anil Namdeo was invited to give a presentation at the ADMS User Group Meeting on 10th October in Birmingham: 'Emissions and dispersion modelling of road user charging initiatives in Leeds'. He was invited guest editor for the International Journal of Environment and Waste Management, Special Issue, Urban Air Pollution, Volume 9, Number 2 (to be published 2009). He was also invited reviewer of conference papers for the ITS 6th European Congress and Exhibition, Aalborg, Denmark, January 2007.

Professor Chris Nash was a judge at the Institute of Railway Operators essay competition; the award was made at their annual lunch on 13th April. On 19th July, he gave a presentation on European rail reform at a workshop on regulation at the Catholic University of Milan. He also visited Information Technology Service at Monash University to give the 2007 Ogden Transport Lecture. In Japan, Professor Nash spoke at two seminars organised by the Institute of Transportation Economics to celebrate the 60th anniversary of the journal Transportation and Economy.

Matthew Page gave an invited presentation on ITS work on cycling and walking entitled 'Estimating the demand and valuing the benefits' to a meeting organised by the Irish Sustainable Development Council (Comhar) on 'Cycling and Walking in Irish Transport Policy' on 21st June 2007 in Dublin. Matthew Page gave an invited talk to the local graduate and student branch of the Institution of Highways and Transportation (IHT) entitled 'Is Personal Carbon Trading the best way to achieve the UK targets for reductions in carbon emissions?' pointing out some of the drawbacks of this idea on 25th June 2007 in Leeds.

Dr Simon Shepherd was invited to give a seminar at the Hong Kong University of Science and Technology by Professor Hai Yang about European transport policy under scarcity of oil supply.

Dr Andrew Smith was invited to present the results of an econometric cost modelling exercise to a seminar held by the UIC (International Union of Railways) entitled '10 years of Benchmarking: 1996-2005' (25th October 2007). The research is being funded by the Office of Rail Regulation (ORR), in order to feed into the 2008 Periodic Review of Network Rail's finances. Dr Andrew Smith was invited to speak at an Oxford University, Transport Studies Unit Seminar entitled 'European Rail Policy: A New Era?' in September 2007. Dr Smith presented his work on 'UK experiences of rail restructuring and privatisation'. He also presented his work on passenger rail franchising in the UK to the Chartered Institute of Logistics and Transport (CILT) in February 2007.

Dr James Tate led the seminar 'Towards integrated traffic microsimulation and instantaneous emission models', on 18th April 2007 at the Department of Statistics and Operations Research, Universitat Politècnica de Catalunya, Barcelona, Spain.

Dr Miles Tight was invited to attend an Expert workshop, led by David Quarmby, as part of the RSA's (Royal Society for the encouragement of Arts, Manufactures and Commerce) CarbonLimited project – exploring Personal Carbon Trading (PCT), 14th February 2007.

Paul Timms was invited by the government of New Zealand to talk about transport utopias in July 2007. He was also invited by the government of El Salvador to talk about transport modelling in September 2007.

Professor Mark Wardman completed his term as Director of Research at the end of 2007 prior to taking over as Director of ITS. He served as a member of an academic advisory panel for Yorkshire Water's consumer willingness to pay study, and advisor to the Dutch value of time and reliability study (phase 1) to EFTEC (Economics

for the Environment Consultancy) on the United Utilities consumer willingness to pay study. He also became a member of the Editorial Advisory Board of the Journal of Choice Modelling.

Professor David Watling hosted Shoichiro Nakayama (Kanazawa University, Japan) for a short visit in January, as part of an on-going link, Dr Nakayama now having a visiting appointment with ITS.

VISITORS

Academic visitors during 2007 were Dr Elisabete Arsenio from LNEC, Lisbon, Portugal; Dr Gyeng Chul Kim from Seoul Development Institute of Seoul; Professor Baohua Mao from Beijing Jiatong University; Dr Anna Mezyk from Technical University of Radom, Poland; Mr Tsubota Takahiro from Department of Civil Engineering, University of Tokyo and Ms Ellen Tangkudung from Department of Civil Engineering, University of Indonesia. New visiting appointments were Dr Min-Keong Chong from National University of Singapore and Dr Shoichiro Nakayama from Graduate School of Natural Science and Technology, Kanazawa University, Japan. Other on-going visiting appointments are Professor Ken Gwilliam; Dr John Parkin from Bolton Institute; Dr Derek Quinn; Jonathan Tyler from Passenger Transport Networks and Dr Tom Van Vuren from Mott MacDonald.

PHDS AWARDED

Six PhDs were awarded in 2007: Chandra Balijepalli, 'Stochastic Process Models for Dynamic Traffic Assignment'; Hui (Lucy) Lu, 'The effects of stated preference design on bias in responses'; Hien Nguyen, 'Saturation flow and vehicle equivalence factors in traffic dominated by motorcycles'; Nasir SK Rana, 'The contribution of teleworking to Travel Demand Management'; P (Tom) Sillaparcharn, 'National Transport Modelling: General approach and application to Thailand'; Minh Tran Huu, 'Modelling bus priorities in a motorcycle-dominated environment'.

RESEARCH STUDENTS

Other than those awarded degrees in 2007, the research students registered and their research topics were: Muhammad Adnan, 'Traffic Network Modeling within Activity Based Paradigm'; Robert S Bain, 'Privately Financed Roads in Britain—A Policy Assessment'; Hazel Baslington, 'Healthy Travel and Child Socialisation: Policy implications for social and cultural change'; Zahara Batool, 'Building of transport model for the metropolitan's of 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'; Pelle Envall, 'Accessibility planning: a chimera?'; Agha Faisal Habib Pathan, 'Traveller Choice of Information Sources'; Helen Harwatt (formerly Watters), 'Tradable carbon permits: their potential to reduce CO2 from the transport sector'; James Jackson,' Appraisal Methods for Railways Servicing Peripheral Areas'; Hamish Jamson, 'The Effects of Varying Characteristics of Driving Simulator Design on their Validity as Research Tools'; Sanjay Jamuar, 'Evaluation of Car Park Policies'; Charlotte Kelly, ' An investigation into the effects of moving house on people's mobility levels'; Andrew Koh, 'Particle swarm optimisation for transport planning'; Christian Kramer, 'Applying Environmental Capacity-Building Theory to Analyse Barriers to Sustainable Transport Policies'; 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 Maurer, 'Development of a policy framework for estimating emissions from freight transport'; Daniel McGehee, 'The Biodynamics of Pre-Impact Bracing: Towards Smart Airbags and Smarter Dummies'; Rico Merkert, '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 methodology 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'; Katherine Robertshaw, 'Visual Control of Locomotion'; Manoj Singh, 'Competition in intermodal rail transport: The case of Indian railways'; Janos Szabo, 'Extreme value theory and air pollution'; Giovanni Tabacco, 'Essays in Industrial Organisation in the US Airline Industry'; Nigel Tapley, 'Nonlinearities in discrete choice attribute valuations'; Fitsum Teklu, 'Modelling an integrated urban public transport system including Informal Operators'; Sotirios Thanos, 'Valuation of Aircraft Noise Annoyance: A comparison of approaches in the context of airport closure'; 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, 'The development of an ultra-fine particle model for motor vehicles in a restricted area'.

SAFETY

Field operational test support action (FESTA)
European Commission from November 2007 to May 2008
Professor Oliver Carsten, Kathryn Chorlton, Dr Frank Lai, Dr Yvonne Barnard, John Nellthorp, Grant holder: Dr Samantha Jamson
Collaborating partners: 20 Partners across Europe

Within the Information and Communication Technologies (ICT) Priority, Field Operational Tests (FOT) will be the subject of one of the first calls in Challenge 6: ICT for Mobility, Environmental Sustainability and Energy. The FOTs will comprise a comprehensive program of research to assess the impacts of ICT systems on driver behaviour, both in terms of individual (safety) benefits and larger scale socio-economic benefits. FESTA will provide such support by designing a handbook of good practice. The handbook will provide 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 will cover 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.
Highways Agency, from October 2007 to December 2008
Grant Holder: Dr Natasha Merat
Collaborating Partners: TMS Consultancy, North Yorkshire Police

This project will use the University of Leeds Driving Simulator to identify a number of low-cost engineering measures for reducing fatigue related accidents. This study is part of a wider field of research intended to contribute to improving safety on the highway network and is a natural progression from previous research commissioned by the HA with regard to driver fatigue. The project is managed by Parsons Brinckerhoff (PB).

EASY
EPSRC 2007-2009
Hamish Jamson, Dr Samantha Jamson, Tony Horrobin, Dr Natasha Merat, Dr Frank Lai, Kathryn Chorlton, R Auclan, Grant Holder: Professor Oliver Carsten

This project will examine 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 will conduct a systematic evaluation of driver performance and safety awareness as they experience increasingly greater automation of the driving task. The major tool for this work will be 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, 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 organisations 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
Commission for Integrated Transport and Motorists Forum from July 2007 to June 2008
Dr Samantha Jamson, Dr Frank Lai, Kathryn Chorlton, Nusrat Walid, Dr David Carslaw, Dr Paul Goodman, Professor Mark Wardman, Grant Holder: Professor Oliver Carsten

The overall aim of this project is 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: (replace numbers with bullets)

- 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;
- estimating the reductions in carbon emissions, other pollutants (including noise) and fuel consumption that would arise through the introduction of a voluntary ISA system;
- assessing the other benefits e.g. journey time reliability that would also arise through the introduction of a voluntary ISA system;
- 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;
- making recommendations on how a greater take-up of ISA on a voluntary basis can be encouraged.

Conflict Study
Department for Transport from May 2007- July 2008
Grant Holder: Professor Oliver Carsten

The primary objective is 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.

Improved driver comprehension at roadworks
Highways Agency from January 2007 to December 2007
Hamish Jamson, Tony Horrobin, Kathryn Chorlton, Grant holder: Dr Samantha Jamson
Collaborating partners: WSP Group PLC

HA's customer satisfaction surveys consistently show that the quality and consistency of signing of roadworks is an important issue to drivers. The main aim of the project was to establish which roadwork scenarios have the most severe implications for both driver and roadworker safety and identify the types of signage in these scenarios that can cause confusion or anxiety to drivers. After testing some novel alternatives in a static environment and conducting focus groups with drivers who regularly encounter roadworks, we modelled the key roadworks scenarios in the University of Leeds Driving Simulator. Forty drivers negotiated several sets of roadworks with varying amounts and types of signage and their behavioral response recorded. In addition, drivers' emotional reactions were monitored using measurements of heart rate and galvanic skin response. Drivers demonstrated anger and anxiety at a number of the scenarios and this translated into poorer driver performance. We successfully mediated this effect, to some extent, with novel signing which indicated to drivers the correct course of action earlier in the roadwork scenario.

Driver behaviour considerations during the implementation of Variable Speed Limits at Road Works
Mott McDonald, from March 2006 to August 2007
Grant Holder: Dr Natasha Merat

This was a small piece of work which provided a summary of the research conducted to date on drivers' attitude towards, and understanding of, Variable Speed Limits (VSL). A list of recommendations was then made about the issues which should be considered for any 'driver behaviour' considerations related to the implementation and use of Variable Speed Limits (VSL) at road works.

Interaction between speed choice and road environment
Department for Transport from February 2006 to August 2007
Collaborating partners: Vehicle Safety Research Centre, Loughborough University
Dr Samantha Jamson, Dr Frank Lai, Hamish Jamson, Tony Horrobin, Grant holder: Professor Oliver Carsten

This project aims to identify the most effective speed reducing measures for a selection of urban and rural environments. This will be achieved by furthering our understanding as to how drivers choose their speed (consciously or not) and what sensory cues we might use to alter this. A literature review has identified potential approaches to increase drivers' perceived risk and hence achieve speed reduction. Potential treatments will then be designed, for both rural and urban environments. Expert assessment will be carried out to identify candidate treatments, which are most likely to be effective and persistent, to be tested in the University of Leeds Driving Simulator. The most successful treatments identified in the review will be assessed for both their effectiveness and persistence. Approximately 20–25 treatments across both rural and urban environments will be tested including urban and rural arterials and low standard rural lanes. The best performing two or three treatments for each problem from the simulator trials will, for the persistence study, be located at three or four

locations in a long-duration experimental drive. Information on speed choice over the repeating sections will permit the identification of treatments that are durable.

Attitudes to New Technologies
Department for Transport from January 2006 to December 2007
Collaborating partners: ACCENT
Dr Samantha Jamson, Kathryn Chorlton, Dr Natasha Merat, Grant holder: Professor Oliver Carsten

This project used an extensive programme of qualitative research to explore public acceptability of new and emerging technologies. These technologies, such as Automatic Number Plate Recognition and Electronic Vehicle Identification can potentially improve road safety and security; however these benefits can be offset by lack of trust and understanding by the general public. The project aimed to support policy makers by undertaking focus groups using relevant deliberative material, sourced from the press and interest groups. Analyses will be undertaken to establish how the deliberative materials influence public perceptions to aid the understanding of public resistance to and acceptance of emerging transport-related technologies.

Adaptive Integrated Driver-vehicle InterfacE (AIDE)
EU Sixth Framework from 2004 to 2008
Volvo Technology Corporation (coordinator); European Commission Joint Research Centre; Netherlands Organisation for Applied Scientific Research (TNO); Institute of Communications and Computer Systems, Greece (ICCS); and 23 other partners
Dr Samantha Jamson, Dr Natasha Merat, Dr Frank Lai, Hamish Jamson, Grant Holder: Professor Oliver Carsten

The general objective of the AIDE Integrated Project is 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 is designing, developing and validating a generic Adaptive Integrated Driver-vehicle InterfacE (AIDE) that employs 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 will be implemented, demonstrated and validated in three different test vehicles: a city car, a luxury car and a heavy truck. ITS is involved in two sub-projects of AIDE: SP1, Behavioural Effects and Driver-Vehicle-Environment Modelling; and SP2, Evaluation and Assessment Methodology.

NETWORK MODELLING

A Theoretical Approach to Deriving Practical Road Pricing Cordons with Investment in Capacity
EPSRC from September 2005 to September 2008
PhD Studentship: Anna Clark, Researchers: Dr Agachai Sumalee, Andrew Koh, Project Manager: Dr Simon Shepherd, Grant Holders: Professor Anthony May, Professor David Watling.

The project follows on from our previous EPSRC project into cordon design. The principal aim of the project is to advance methodologies for identifying optimal cordon designs and charge structures with optimal changes in capacity taking into account the needs of practitioners. The first stage concentrated on implementing a constraint cutting algorithm approach as described by Lawphongpanich and Hearn (2004) to solve the optimal toll level for a given set of links and we have extended it to incorporate investment in capacity. This has been implemented in Matlab and proved successful on small networks. Results have been presented to UTSG and HKST. As this approach presented problems with larger networks we will employ a sensitivity based approach to the same problem. The second stage of the project is now nearing completion and looks at location of tolls and capacity changes in parallel extending our previous work with genetic algorithms. This approach has been applied successfully to the network of Edinburgh and we will be extending it to deal with multiple user classes. In parallel we developed a short-cut approach to cordon location which has been included in the Department for Transport's webtag guidance and which we presented at WCTR in Berkeley CA. Finally, collaboration with Professor Erik Verhoef from FUA has enabled us to look at the theoretical first best case for capacity and tolls on a network and we are currently working with him on an extension to the second-best case where not all links are included in the optimisation.

Platform Grant: Towards a Unified Theoretical Framework for Transport Network and Choice Modelling
EPSRC from January 2004 to December 2007
Dr Paul Timms, Dr Richard Batley, Dr Agachai Sumalee, Dr Richard Connors, Dr Simon Shepherd, John Nellthorp, Dr Gerard Whelan, Grant holders: Professor David Watling, Professor Andrew Daly, Professor Anthony May

In the spirit of Platform Grant funding, this project supported a range of strategic, speculative and networking activities, adding value to our wider portfolio of research projects and aiding in staff retention by supporting the careers of research staff. Broadly the research agenda was concerned with beginning the search for a consistent theoretical under-pinning to the typically disparate fields of transport network modelling, travel choice modelling and economic appraisal of transport schemes. Many speculative studies were undertaken, examples including a retrospective of the philosophical foundations of transport modelling, an exploration of the equivalence between RUM (Random Utility Model) and non-RUM choice paradigms, and a linking of prospect theory to network modelling for the purposes of modelling uncertainty/unreliability. Networking activities included several extended visits of up to a year to and from leading Japanese transport groups; a series of workshops with transport groups from leading Italian universities; and culminated in our establishing and organising the First International Symposium on Dynamic Traffic Assignment in Leeds in 2006, now established as an international conference series. Finally, the grant supported the group's development into areas that were new for them, such as public transport assignment and activity-based modelling, and served as a platform for developing a range of successful research funding bids for follow-on research.

ECONOMICS AND BEHAVIOUR MODELLING

Effects of Station Enhancement on Rail Demand
ATOC, with University of Southampton and ACCENT, from June 2007 to November 2007
Phani Kumar Chintakayala Grant Holder: Professor Mark Wardman

There are uncertainties as to the effects of improving station facilities on the demand for rail travel, and indeed whether any demand increases are subsequently offset through decay effects. This study has used a dual approach to estimate the impact of station facilities. Tickets sales data has been analysed to detect any effects on demand from a range of improvements. The ITS contribution, in conjunction with Accent, has been to conduct a wide-ranging SP study, covering a large number of facilities. The valuations of these facilities are then used to enhance and refine the demand model estimated to ticket sales data. Modest demand increases are seen to result from station enhancements but with subsequent decay effects.

CATRIN (Cost Allocation of Transport Infrastructure)
European Commission Sixth Framework from May 2007 to April 2009
Dr Andrew Smith, Dr Jeremy Toner, Phillip Wheat and Pedro Abrantes, Grant Holder: Professor Chris Nash

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
Department for Transport from March 2007 to December 2008
Collaborating Partners: Faber Maunsell
Mark Wardman, Joyce Dargay, Nicolas Ibanez Grant Holder: Jeremy Shires

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 which are due to be piloted in spring 2008.

London Fares Elasticities
MVA Ltd / ATOC from March 2007 to August 2007
Professor Mark Wardman, William Lythgoe Grant Holder: Dr Joyce Dargay

The main objective of this study is to investigate the effects of the change in the fare structure brought about by the zonalisation of non-season tickets. The study is to be limited to trips to Zones 1 and 2 from Zones 4, 5 and 6, since these have experienced the greatest fare changes. Specific points to be addressed are:

- The effect on the demand for rail travel, by both previous rail users and new patrons (modal shirt and generation/suppression)
- The extent of resulting substitution between different ticket types
- The effect on different journey types (commuting, business, leisure)
- The effect on station choice
- Whether the response is related to the level of the fare change, rather than the percentage change

The study will be based on both econometric analysis and new market research which will permit the consideration of attitudinal factors.

Revealed Preference Study to Assess Impact of Reliability on Passenger Rail Demand
Department for Transport from October 2006-March 2007
Professor Mark Wardman, Dr Joyce Dargay, Jeremy Shires, Dr Nicholas Ibanez, Professor Gerard de Jong, Nusrat Walid, Grant holder: Dr Richard Batley

This study involved both econometric and discrete choice analyses, with the aim of eliciting distinct but complementary insights, at aggregate and disaggregate levels respectively, on the demand impacts of reliability.

The discrete choice analysis was supported principally by a Stated Preference experiment, involving a choice between two rail service options exhibiting different fares, journey times and levels of reliability. The experiment was applied to 12 specific single-leg O-D journeys, yielding around 14,000 choice observations. These data were applied to model specifications based essentially on the 'mean vs. variance' approach, but extended to include a variable representing lateness at destination. We estimated reliability multipliers for business and commuting of 1.19-2.85, these increasing to 1.32-7.34 for leisure.

The econometric analysis was based on 248 specific O-D pairs for the period 2002-2007, contrasting flows which had been subject to significant changes in reliability, with flows which had not experienced such changes. In respect of this sample, we collated ALM and APM data at service group level, as well as TOC-level PPM data. These reliability data were combined with demand and revenue data from LENNON, generalised journey times from MOIRA, as well as further socio-economic-demographic variables from ONS. Following previous work on rail demand, a constant elasticity demand model was specified, and estimated by GLS. We found that the estimated reliability coefficients were significant and of the correct sign, but reliability was found to have only a marginal effect on rail demand. Although season tickets appeared to be slightly more sensitive to changes in reliability, the differences in the elasticities for ALM and APM (ranging from -0.03 to -0.06) across the different ticket types were insignificant. The elasticity for PPM, however, was significantly greater for reduced (0.25) and season tickets (0.27) than for full-fare tickets (0.09).

Green Logistics
EPSRC from June 2006 to June 2010.
Collaborating Partners: Cardiff University, Heriot-Watt University, Lancaster University, University of Southampton, University of Westminster
Dr Anthony Fowkes, Daniel Johnson, Dr S Shen, Damian Stantchev, Grant Holder: Dr Anthony Whiteing

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.

M6 Toll
Faber Maunsell from April 2006 to September 2007
Dan Johnson, Dr Tony Fowkes Grant Holder: Professor Mark Wardman

The 43 km three lane M6 Toll road is the United Kingdom's first toll motorway and provides the setting for this research. This study has developed a range of stated preference and revealed preference models to better understand the choices made by passengers and freight users between different routes amongst which one is a tolled route. A major program of surveys was conducted on car, LGV and HGV users based around the time savings offered by the M6 Toll road. The findings indicate different valuations of travel time by type of time, traffic conditions, road type, journey duration and a range of socio-economic factors. Stated preference models validated well against revealed preference models, although the sensitivity to toll varied according to the context for the toll variation. The opportunity was also taken to distribute the questionnaires used in the Department for Transport's 1994 value of time study to those out of scope for this study to determine how the valuation of time and the response to tolls varies over time. The findings indicate, in line with other such studies, little increase in the value of time over time. Nonetheless, there is evidence to suggest that the sensitivity to toll is reducing over time.

GRACE (Generalisation of Research on Accounts and Cost Estimation)
European Commission Sixth Framework from July 2005 to 2007
Bryan Matthews, Professor Peter Bonsall, Daniel Johnson, Jeremy Shires, Dr Andrew Smith, Phillip Wheat. Grant Holder: Professor Chris Nash

The project involves a consortium of 15 partners in 11 countries. The aim is to provide new evidence on the costs of transport infrastructure use for all modes of transport, and on the consequences of charging these costs to users.

The first part of the work concentrated on new econometric studies of road and rail, and airport infrastructure costs, new estimates of congestion and environmental costs and an examination of ports and inland waterways. Previous work on transport accounts in helping to measure and monitor costs has been extended and updated. Later work examined the reactions of users to complex charging systems, sought to generalize results and to model the economic impact of improved charging systems.

IMPRINT-NET
European Commission Sixth Framework, from July 2005 to July 2008
Collaborating Partners: ISIS (Italy), TNO INro (Netherlands), TUD (Germany) and BUTE (Hungary)
P Wheat, J Laird, B Matthews, B Menaz Grant Holder: Professor Chris Nash

IMPRINT-NET is about enhancing the links between research and policy in the area of transport pricing. Accordingly, the state of the assessment must cover:

a) the knowledge accrued so far as a result of research projects
b) the past history and current state of policy developments
c) the lessons learned from previous initiatives linking pricing research with transport policy formulation.

It intends to effectively build upon the experience accrued and the lessons learned from its predecessors, namely the CAPRI Concerted Action in FP4 and the IMPRINT-EUROPE Thematic Network in FP5. IMPRINT-NET has been designed to retain the most effective features of its predecessors, while introducing a number of important innovations, both in substance and in organization.

DIFFERENT - User Reaction and Efficient Differentiation of Charges and Tolls
EU DGTREN from May 2005 to May 2008
Collaborating Partners: Transport Research Institute, Napier University (TRi) – project leaders; EIT; ESI-VU; ILiM; ISIS; TRT;TUD; CERAS; DITS;ECOPLAN; SINTEF; UM-TEMM
Dr Bill Lythgoe, Bryan Matthews, Batool Menaz, Philip Wickham, Grant Holder: Professor Peter Bonsall

This project uses literature, case studies and new analyses to investigate the use of differentiated charges to internalise the externalities of transport and examines the implications that differentiation has for revenues and behavioural response. ITS's main roles in this project have been to contribute to the psychological investigation of behavioural response, to lead the work on rail charges and on recommendations for road user charges, and to study the implications of co-implementation of urban and inter-urban charges and the impacts that differentiated charges might have on modal split. ITS have been responsible for the design and implementation of a questionnaire survey of road users, of a laboratory-based investigation of drivers' engagement with, and responses to, differentiated pricing and of an elasticity-driven multimodal model of traveller behavior under different tax-subsidy-charging scenarios. Our work on the psychological factors affecting behavioural response to complex charges has thrown interesting new light on the role of 'need for cognition' and on the relationship with attitudes to pricing per se. Our rail-sector work has used case studies in Austria, Britain, France, Germany, Italy and Sweden to explore the mechanisms by which differentiated rail infrastructure charges induce operational and behavioural responses from train operators.

Consumer Response to Complex Prices
Department for Transport from May 2005 to January 2008
Collaborating Partners: BMRB and MVA
Grant Holder: Professor Peter Bonsall

This work was commissioned following a review, conducted for the Department for Transport by ITS, of previous evidence on consumers' response to complex or highly differentiated prices. The project had two main phases; the first qualitative and the second quantitative. The qualitative phase involved focus groups and in-depth interviews exploring people's general attitudes to prices and methods of payment, and their specific response to uncertainty or complexity in prices. Its findings included evidence of a widespread tendency to disengage from the process of evaluating prices, widespread lack of knowledge about the cost of individual car journeys and a tendency to consider the cost as an 'irrelevant' consideration. The quantitative phase involved the specification, development and trialling of a questionnaire which could establish the prevalence and incidence of these attitudes but, more specifically, could assist in the specification of more realistic models of the performance of road pricing schemes. Variants on the questionnaire have been implemented in various cities in the UK and Europe and have supported the development of discrete choice models which offer some explanation of the fact that responses to new charges often differ from what might be expected on the basis of conventional elasticities. Further use of the questionnaire, or of variants on it, is strongly recommended.

Rail Research UK
EPSRC from April 2003 to July 2009
Daniel Johnson, Dr Andrew Smith, Phillip Wheat, Grant Holders: Professor Chris Nash and Professor Mark Wardman

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. The second is the value of reliability, where we will be building on previous work for the Department for Transport.

Real Productivity Differentials
Department for Transport from March 2007 to April 2008
Daniel Johnson, James Laird, Professor Peter Mackie, Grant Holder: Professor Joyce Dargay

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, qualifications), occupation, job characteristics and firm characteristics.

TRANSPORT ENVIRONMENT AND INFORMATICS

Analysis of Fast Response Nitrogen Dioxides
Air Quality Consultants/DEFRA from January 2007 to June 2007
Karl Ropkins, Grant Holder: Dr David Carslaw

ITS together with Air Quality Consultants have completed a research project considering the measurement of nitrogen oxides close to the northern runway of Heathrow, on behalf of Defra. The project developed and applied some innovative techniques based on chemometrics to analyse over 5,500 individual aircraft plumes. This research showed for the first time how emissions from aircraft vary by aircraft and engine types and airline and provided many new insights into aircraft emissions. This research has been published in Environmental Science and Technology and highlighted in their science news (see http://pubs.acs.org/subscribe/journals/esthag-w/2008/feb/science/cc_aircraftemissions.html for the news item and a copy of the paper). D.C Carslaw, K. Ropkins, D. Laxen, S. Moorcroft, B. Marner, M.L. Williams. Environmental Science and Technology, 42, No. 6, (2008), 1871-1876.

MESSAGE (Mobile Environmental Sensing System Across a Grid Environment)
EPSRC and the Department for Transport from October 2006 to September 2009
Collaborating Partners: support from nineteen industrial organisations
Consortium of five universities led by Professor John Polak (Imperial College London), Professor Margaret Bell (Newcastle), Professor Phil Blythe (Newcastle), Dr Haibo Chen (Leeds), Professor Peter Landshoff (Cambridge), Professor Michael McDonald (Southampton).

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.

York Low Emissions Zone
DEFRA from 2006 to 2007
Collaborating Partner: City of York Council
Dr Karl Ropkins, Stephen Peacock, Colin Oates, Ben Broadbent, Stephen Dreschler, Grant Holder: Dr James Tate

Tailpipe emissions of vehicles as they drive-through a test site can now be measured by Remote Sensing Devices (RSD). These instruments scan the exhaust plume trailing a vehicle as it drives through a test-site. The Instrumented City RSD system, manufactured by www.esp-global.com/ is able to characterise CO, CO2, HC and NO emissions from 1000's of vehicles per day. Simultaneous measurements of vehicle speed and acceleration, alongside a static image of the vehicle license plate are automatically captured. RSD systems are a highly effective tool for the characterisation of local vehicle fleets, the evaluation of implemented traffic management strategies and vehicle impact reduction technologies, as well as the identification of atypical vehicles, e.g. high emitter or gross polluter vehicles.

This Project involved running the Instrumented City RSD system at a suitable single location, in the City of York. Data collection was completed in April 2007. Data analysis and interpretation has characterised the age/ type/ emission characteristics of the vehicle fleet. The variability in emissions, with particular attention paid to the proportion and significance of high-emitters, was illustrated. The potential impact of a York LEZ scheme at the survey location was also quantified. Scenarios included: All pre-EURO I vehicles excluded, All pre-EURO II vehicles excluded, and All pre-EURO II HCV/ Buses excluded.

MoSeS: Modelling and Simulation for e-Social Science
ESRC from 2005 to 2008
Dr Haibo Chen, Professor Jie Xu, Professor Justin Keen, Professor Martin Clarke, Professor Phil Rees, Grant Holder: Dr Mark Birkin (School of Geography, University of Leeds)

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.

Sustainability Of Land Use and Transport In Outer NeighbourhoodS (SOLUTIONS)
EPSRC from April 2004 to September 2008
Collaborating Partners: Dr Tony Hargreaves, Professor Marcial Echenique, The Martin Centre, University of Cambridge: Professor Hugh Barton (UWE), Dr Stephen Marshall (ICS), John Nelson, TORG, University of Newcastle
Dr Anil Namdeo, Grant Holder: Dr Gordon Mitchell

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.

To date, a series of development scenarios have been agreed with stakeholders, and implemented within a land use transport interaction (LUTI) model for London and the Wider SE region (using the MEPLAN LASER model). 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). Finalised LASER model outputs for the London study became available in early 2008, and are currently undergoing sustainability appraisal through application of the appraisal framework and supporting models. The final outputs of the research will include a report describing the effect of alternative growth accommodation strategies on sustainability of London and the Wider SE to 2030, and practical guidance for the development of more sustainable cities, focused on outer city regions.

Future Urban Technologies Undertaking Research to Enhance Sustainability (FUTURES)
EPSRC from April 2004 to March 2009
Collaborating partners: Energy and Resources Research Institute (ERRI), University of Leeds, Transport Research Group, University of Southampton, Institute of Sound and Vibration Research, University of Southampton, Unit for Transport & Society, University of the West of England, Bristol, Centre for Human Service Technology, University of Southampton, Intelligence, Agents, Multimedia Group, University of Southampton, Transport Research Laboratory (TRL)
Dr Paul Goodman, Grant holder: Professor Margaret Bell

ITS, in collaboration with ERRI of the LANTERN project, is engaged with the core project of FUTURES namely: Environment Assessment of New Vehicle Technology with Improved Confidence. FUTURES is one of four transport research consortia within the EPSRC's Towards a Sustainable Urban Environment Programme. The project, following on from an initial scoping study, is a five-year research programme to investigate and promote the role of new technologies in achieving sustainable urban mobility. FUTURES will address the ways in which new transport-related technologies will be able to contribute to a sustainable urban environment. There is no single scenario or vision which describes the extent to which various communications, location, detection, materials, power train, vehicle and computing technologies can contribute to a sustainable urban environment. Travellers can have their urban mobility needs met in effective and efficient ways through a mixture of conventional and novel services, utilising advanced vehicle and related technologies and tele-services. Understanding and quantifying the opportunities involves social, environmental, traffic, mobility, location/communication, vehicle, goods and operational issues, from a range of disciplines. The FUTURES consortium is

comprised of six main research groupings in four institutions. The consortium possesses a collective and complementary expertise and track record in the understanding, development, application and opportunities of transport and transport-related technologies. It also harnesses an understanding of people, systems and vehicles which FUTURES believes are the three key 'actors' in the use of new technologies to pursue sustainable urban mobility. The overriding priority of the consortium is to conduct high quality research. More information on SUE FUTURES is available on the ITS iC website.

RETEMM (Real World Traffic Emissions Monitoring and Modelling)
EPSRC from October 2003 to September 2007
Collaborating Partners: Energy & Resources Research Institute (University of Leeds), City Councils of York, Leeds, Ford
Dr Haibo Chen, Dr Karl Ropkins, Dr Phillip Skelton, Dr James Tate, Grant holder: Professor Margaret Bell

The RETEMM EPSRC project is a collaborative venture between the ITS and ERRI Departments at the University of Leeds. The project is researching real-world, regulated and unregulated emissions at a low time resolution. This is being achieved using novel in-vehicle emission measurements and co-ordinated engine dynamometer tests. The effect of vehicle age/technology, bio-fuels, cold-starts and driver behaviour on exhaust emissions is being investigated, with the findings informing integrated traffic and emission modelling tools. Making best use of LANTERN and SRIF2 funded infrastructure, a significant co-ordinated survey campaign has taken place at the Leeds test site, including: static traffic monitoring (flow, classification, fleet composition and age, journey time), local meteorology, roadside air quality concentrations and instrumented vehicle data. A fleet of six instrumented vehicles (equipped with a blend of driver behaviour, fuel, tail-pipe and GPS devices) circulated the test site in a range of traffic conditions (busy, quiet, congested). Outputs to date include: review of vehicle emission measurement technologies, assessment of the real-world emission characteristics from a passenger car using a bio-fuel, evaluation of a traffic management strategy in Leeds to promote the smooth progression of vehicles, assessment of 'cold-starts' on emissions from passenger car in real-world conditions, a study of the impact of vehicle technology and driver behaviour on tail-pipe emissions. More information on RETEMM is available on the ITS iC website.

POLICY AND APPRAISAL

Airport evaluation methodology study
LNEC (Portugal) September 2007 to December 2007
John Nellthorp, Dr Astrid Guehnemann, Dr James Tate, Professor Chris Nash, Grant holder Dr Susan Grant-Muller

LNEC were commissioned by the Portuguese Ministry of Public Works, Transport and Communications to investigate the options for a site for a new international airport in Lisbon. ITS has provided advice to the evaluation methodology for the airport sites, in particular in the area of treatment of externalities.

M42 ATM
Highways Agency through Mott Macdonald from September 2002 to August 2008
Professor Peter Bonsall, Dr Haibo Chen, Dr James Tate, Grant holder: Dr Susan Grant-Muller

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 and the project is now drawing towards the final stages of reporting.

MIME (Market Based Impact Mitigation for the Environment)
European-Commission Directorate General for Energy and Transport from 2007 to 2010
Collaborating Partners: Boeing Research and Technology Europe, Spain; SINTEF, Norway; QINETIQ, UK; Eurocontrol Experimental Centre; ENV-ISA, France; Technical University of Munich, Germany.
Dr Astrid Guehnemann, Charlotte Kelly, Helen Harwatt, Grant Holder: Dr Miles Tight

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)
EU Sixth Framework from April 2007 to October 2009
Dr Miles Tight, Mary Kimble, Grant Holder: Dr Astrid Güehnemann

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 will provide 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 concentrates 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 will be 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. 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. For more information visit: www.asset-eu.org

TRKC
European Commission from February 2007 to August 2009
Collaborating partners: IABG (Germany), ISIS (France) DITS (Italy) CDV (Czech Republic)
Batool Menaz, Damian Stantchev, Dr Anthony Whiteing, Dr Paul Timms, Phi Wickham, Grant Holder: Professor Anthony May

The overarching goal of the TRKC is to disseminate and promote the results of transport research conducted in the EU Framework Programmes for research and technological development, in the European Research Area (ERA) beyond. The three key objectives are to enhance and maintain the web-based TRC, providing structured ad timely access to information on EU, national and international transport research activities and results; to provide focused aggregated analysis of transport research results against a thematic structure and emerging policy priorities; and to stimulate innovation in transport by accelerating the application of research results through extended networking.

In achieving these objectives, the TRKC will gather data on research organizations, programmes and projects in a structured way, using the existing 'Reporting Scheme' and supported by a network of geographical subcontractors and a TRKC Support Group across the ERA.

European Union COST 358: Pedestrians' Quality Needs.
Networking grant from November 2006 to November 2010.
Grant Holder: Dr Miles Tight

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
European Commission from May 2006 to April 2011
Collaborating Partners: TNO, ETRA, CRF, INRIA, DLR, Robosoft, TRG, CSST, TRW Conekt, IKA, SINTEF. DITS, GEA, POLIS, Rups, Frog, TML, ISIS, Technion, RATP, Roma, ITR, ATS, GVA, FCVARE, ENQ, UNI
Helen Muir, Charlotte Kelly, Dr Simon Shepherd, Dr Greg Marsden, Dr Astrid Guehnemann, Dr Ronghui Liu, Dr Samantha Jamson, Dr Natasha Merat, Grant Holder: Professor Anthony May

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 out 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 University of Leeds Driving Simulator 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)
European Commission from April 2006 to March 2009.
Collaborating Partner: TTR
Dr David Milne, Andrew Koh Grant Holder: Professor Anthony May

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.
Tyndall Centre for Climate Change Research II from April 2006 to March 2008.
Collaborating Partners: Transport Studies Group, Department of Civil and Building Engineering, University of Loughborough
Helen Harwatt, Dr Paul Timms, Grant holder Dr Miles Tight

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)
MISTRA (The Swedish Foundation for Strategic Environmental Research) From January 2006 to December 2008.
Collaborating Partners: Lund University. Traffic Planning, Lund University, Environmental and Energy Systems Studies, Lund University, Political Science, Lund University, Environmental Strategy, Institute of Transport Economics Norway (TØI), National Environmental Research Institute of Denmark (NERI), Trivector Traffic AB
Pelle Envall, Mary Kimble, Grant holder: Dr Miles Tight

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 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
People Science and Policy LTD, Department for Transport, from 2006 to 2008
Helen Watters, Mary Kimble, Dr Ann Jopson, Dr Miles Tight, Nusrat Walid, Helen Muir, Grant Holder: Dr Gregory Marsden

The aim of this project is 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. The Department for Transport has three broad objectives of exploring public understanding of, and engagement with, climate change, identifying and exploring further the barriers and incentives to behavioral change which could result in reduced impact of personal travel behavior on clime change and within this, 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. The final stages in the project will bring together the discourse from the group meetings with the data on attitudes and travel behaviour change to consider the implications for the three research objectives.

Connected Lives
ESRC from 2005 to 2008
Andrew Clark (LSSI), Grant holder(s): Frances Hodgson and Nick Emmel (Sociology and Social Policy)

The Connected Lives project is concerned with understanding the interrelations of social

networks, mobilities, communities, neighbourhoods and health. The project draws on a number of perspectives from transport studies, geography and sociology and explores the use of qualitatively driven mixed methods, including participatory mapping, mobile methods and qualitative interviews. The Connected Lives project is a project of the Real Life Methods node of the ESRC National Centre for Research Methods.
www.reallifemethods.ac.uk/connected

TRANSLINK (Transportation Research Links for Sustainable Development)
European Commission Asia-Link programme from August 2005 to July 2008.
Collaborating Partners: Department of Infrastructure, Royal Institute of Technology (KTH), Sweden, University of Indonesia, Indonesia, University of MARA,Malaysia.
Dr Nick Marler, Dr Paul Timms, Grant Holder: Dr Miles Tight

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.

Optimal incentive structures for integrated transport strategies
EPSRC from June 2005 to June 2007
Charlotte Kelly, John Nellthorp, Nusrat Walid, Dr Astrid Güehnemann, Grant Holder: Dr Gregory Marsden

This two-year research study into the impacts of the targets and performance rewards in the English local transport plan performance incentives regime has recently been completed. The research studied the likely impacts of the current system and considered whether, if desirable, other incentive regimes might work better.

The research brought together information from interviews, questionnaires, a theoretical model and a laboratory experiment to establish the likely impacts of a range of reward systems. The key findings are that: i) Linking performance rewards to target setting will lead to competition between authorities. Performance rewards can lead to more ambitious target setting. The targets are not necessarily met but, designed right, the system will lead to greater levels of achievement against the key indicators in the system than if no performance rewards are available; ii) If all authorities have an equal chance of submitting excellent plans and achieving them then there should be fewer rewards on offer and the rewards should be larger. If not, the case for a larger number of prizes is stronger; and iii) The English system has had a substantial management cost to try to establish a level playing field between authorities. However, this has only been possible (and even then not uniformly accepted) for a narrow sub-set of indicators. Our work suggests that splitting the contest into several smaller pools of more evenly-matched authorities would have only a small negative impact on the incentives the system produces.

The overall system is designed along the correct principles but is not implemented as well as it could be. Whilst there appear to be benefits from the scheme including authorities striving for and achieving more, there are some serious issues that must be kept in mind if the system is to avoid the side effects

Policy, Economics and Appraisal in Transport (PEAT)
European Commission from September 2004 to August 2008
Grant holder: Dr Susan Grant-Muller

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. In addition to the main work of research, a total of 33 conference and journal papers have been produced by Fellows and disseminated at a range of international conferences.

DISTILLATE (Design and Implementation Support Tools for Integrated Local Land use, Transport and the Environment)
EPSRC from April 2004 to March 2008
Collaborating Partners: TRL; Heriot-Watt University, University of York and University College London
Matthew Page, Dr Simon Shepherd, Dr Greg Marsden, Dr Ann Jopson, Charlotte Kelly, Jeremy Shires, Batool Menaz, Grant holder: Professor Anthony May

DISTILLATE is one of 14 research programmes funded under EPSRC's Sustainable Urban Environment programme. Its principal objective is 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 are being pursued, in conjunction with 15 local authority partners, through a combination of research and case study trials. Detailed surveys of the barriers experienced by local authorities have been carried out and literature reviews on option generation, selection and use of indicators, organisational barriers and funding and a review of modelling capabilities have been completed. A number of 'products' are being developed in each area with local authorities and will help them to overcome the barriers identified. All results are available on the website: www.distillate.ac.uk.

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