INTRODUCTION

Professor Richard Batley took over as Director from Professor Greg Marsden in September 2016.

Greg can look back upon his 5 years as Director with a fantastic sense of achievement, having secured investment for the Institute building project, over twenty new staff, external partnerships and other initiatives. These developments mean that the Institute stands on strong foundations, as we move forwards to pursue the opportunities, and address the challenges, that will emerge over the coming years.

At the University level, our optimism is further buoyed by Leeds’ award of the University of the Year 2017 by The Times and The Sunday Times ‘Good University Guide’. Chosen by a distinguished panel, the Guide showcases the excellent student experience at Leeds.

Benefiting from Greg’s legacy as Director, the Institute moved back into 36-40 University Road in October 2016, following completion of the £4M building project. Boasting a new three-storey modern extension, the investment also involved extensive remodelling and refurbishment work to upgrade the original building, as well as sensitive restoration of original features. This has resulted in an improved learning environment, and will greatly enhance the quality of interactions between our students, staff and industry partners. The official opening of the building was performed by the Secretary of State for Transport, Chris Grayling MP – and this proved to be a highly successful promotional event which further raised the profile of ITS amongst an invited VIP audience of partners (and beyond), and further galvanised a sense of identity and common purpose amongst staff and students.

In 2016 we conducted a major refresh of our research strategy in order to ensure that the Institute is
best positioned to respond to the emerging research questions, funder opportunities, and industry and policy needs. Among the key initiatives from this refresh is ‘Virtuocity’, a University-wide Centre for City Simulation led by Professor Richard Romano. Building upon the Institute’s world-class simulator suite – which is being extended to cover HGVs and pedestrians, as well as cars – Virtuocity will combine simulations from different domains, in order to address the grand challenges that face cities across the world including energy, resources, wellbeing, health, environment, mobility and place-making.

Staff Changes

As in previous years, 2016 saw a degree of renewal among staff, as we welcome newcomers, bade farewell to leavers, and celebrated promotions. Professor Natasha Merat was promoted to a Chair in Human Factors of Transport Systems. Professor Andrew Smith to a Chair in Transport Performance and Economics and Professor Samantha Jamson to a Chair in Transport and Psychology.

Dr Phill Wheat and Dr James Tate were promoted to Associate Professorships.

We welcomed Dr Robin Lovelace and Dr Kate Pangbourne as our second wave of University Academic Fellows, joining the first wave of fellows appointed last year. We also welcomed Professor Jillian Anable, Dr Alex Baker-Graham, Dr Eleonora Morganti, Dr Craig Morton, Dr Luigi Pariota, and Alex Stead. In administrative roles we welcomed Lois Nuttall, Zhenya Purves, Rachael Thomas and Rosie Samuel. We bade farewell to Dr Jiwei Zheng, Jodie Morrison and Luisa Nanovo.

Awards and Prizes

Emeritus Professor Tony May was awarded the Jules Dupuit Prize at the 14th World Conference on Transport Research in Shanghai. The Prize is the highest award made by the WCTRS, and was made in recognition of Tony’s contribution to the development of transport research, particularly related to urban transport policy, and of his contribution to the work of the Society, for which he served as President from 2007 to 2013.

PhD student Haneen Khreis was awarded the World Conference on Transport Research Society (WCTRS) Innovation Grant.

PhD student Tyron Louw won the Best Young Scientist Award at the International Conference on Traffic and Transport Psychology (ICTTP) held in Brisbane, Australia. The award recognises the role that early career researchers play in shaping the next generation of road safety and transportation research and practice.

PhD student Oluwasegun Aluko was awarded the prize for best student paper: “A Model for the Evaluation of Transport Safety Policies in Commercial Motorcycle Operation in Nigeria” at the System Dynamics Society’s annual conference.

Best paper prizes were awarded to:

Dr Eva Heinen for the Best Randomised Controlled Trial/Natural Experiment Paper in the International Journal of Behavioural Nutrition and Physical Activity, and to

Professor Susan Grant-Muller and Frances Hodgson for Distinguished Scientific Papers – Europe Award at the World Congress on Intelligent Transport Systems.

Influencing Government Policy

Professor Andrew Smith gave oral evidence to the House of Commons Transport Committee inquiry into rail franchising, whilst Professor Natasha Merat gave oral evidence to the House of Lords Science and Technology Committee inquiry into Autonomous vehicles.

Research conducted by Professors Greg Marsden and Jillian Anable with colleagues from the University of Glasgow was showcased at the International Transport Forum OECD Council of Ministers conference in Leipzig. The work, drawing on real-time investigations of behavioural responses to major weather events, contributed to background materials for a closed Ministerial Session on responses to disruption.


After 4 years of activities led by Professors Olivier Carsten and Samantha Jamson, the €14.5m ‘ecoDriver’ project released its final results in Stuttgart. The project trials involved 170 drivers in seven countries, both in controlled and naturalistic environments, testing nine different eco-driving support systems. Overall, the findings showed that eco-driving contributed an average 4.2% fuel saving across all systems, with the highest saving (5.8%) on rural roads. Embedded systems (i.e. more elaborate systems, closely linked to the vehicle) were more effective than nomadic systems, with fuel saving of up to 6%.

International Visitors

In the spirit of International Collaboration, the Institute hosted a number of academic visitors most of whom presented their research to staff, students and the wider community. Seminar presentations are available to view on www.its.leeds.ac.uk/slideshare. Our visitors included:

Dr Matthew Beck from University of Sydney, Australia and Dr Amanda Stathopoulos from the Northwestern University, USA were hosted by Professor Stephane Hess. Mathieu Carrier of the Institut National de la Recherche Scientifique (INRA), Quebec, Canada, Dr Eduardo Vasconcellos of the National Public Transport Association, Brazil and Dr Alexa Delbosc from Monash University, Australia were hosted by Professor Karen Lucas. Dr Giovanni circella from the Georgia Institute of Technology, Atlanta, USA, Dr Michael Poku-Boansi of The Premier University of Science and Technology in Ghana and West
Are you interested in recruiting ITS graduates?

Each year we hold Employer Visit Days where employers from the transport sector visit the campus to give presentations to, and/or interview current students. This is a unique opportunity for students to gain direct access to employers, and for employers to gain access to ITS graduates.

International students make up 75% of our full-time cohort and are drawn from 35 countries. International job opportunities would be greatly welcomed. Companies based outside the UK, and interested in employing ITS graduates for their international offices, can register their interest to take part in a Virtual Employer Day. This is a format whereby companies take part in a Virtual Employer Day. Each year we hold Employer Visit Days where employers from the transport sector visit the campus to gain access to ITS graduates.

PhDs awarded

Postgraduate research degrees were awarded to six of our students in the past year: Nicholas Herbert

Christopher Rushton, Ehsan Sadraei, Arwa Sayegh, Aswin Siregar, Fangquing Song, Daosadeth Soysouvanh, Panagiotis Spyridakos, Sidi Sun, Tianli Tang, Yvonne Taylor, Lap Kwan Tjong, Nur Ubaidillah, Chinebuli Uzondu, Ersilia Verlingheri, Conor Walsh, Yin Wang, Yao Yao, Jingyan Yu, Weiming Zhao and Tatjana Zimasa.

Collaborating with colleagues across campus, ITS staff co-supervised five students registered in other Schools at the University of Leeds: Sakarias Bank (Psychology); Pablo Guillen (Computing); Maha Alsabbagh (Earth & Environment); Dr Ashkay Dwaranakath (Medicine & Health); Kate Palmer (Doctoral Training Centre) and Daisy Thomas (Engineering).

Alumni Events

During the past year we welcomed return visits to Leeds by alumni Lea Ruzic (2012) at the ITS summer BBQ and Alex Ryan (2015) at a student induction event. Michele Dix CBE (1982), Ben Still (1997) and Ian Palmer (1996) presented seminars at ITS. The University Big Get Together campaign saw five worldwide events hosted by ITS alumni in Ghana, Uganda, UK, Bangladesh and Vietnam. At overseas events we had the opportunity to catch up with alumni in Indonesia, Argentina, India and Chile, and at WCTRS in China we hosted an alumni event where Jialiang Guo (2014) gave a keynote speech.

Alumni news, events and over 120 career profiles representing 48 countries can be found at www.its.leeds.ac.uk/alumni. If you would like to post your profile please get in touch via http://www.its.leeds.ac.uk/contactU.
RESEARCH PROJECTS

Expertise at the Institute ranges from engineering, modelling and econometrics through to psychology and sociology. The quality of our research delivery is underpinned by ISO9001 accreditation which provides those commissioning research from ITS with a high degree of confidence in the quality of the research and the professionalism and ethics of our processes.

The organisation of ITS research is in accordance with a “Research Landscape” that has been restructured to meet the emerging challenges in transport and to enhance opportunities for multi-disciplinary research collaborations both within and beyond the University. Our new research groups, priority themes and centres together make up this Landscape, and are featured on the ITS website.

Our thematic approach is organised to support the development of an intelligent mobility system which is Connected (integrated in terms of modes and systems); Inclusive (addressing disadvantage and supporting equity); Productive (promoting economic and social wellbeing) and Resilient (sustainable, flexible and responsive to external pressures).

The range of research carried out at the Institute is demonstrated in the extensive list of projects which are described below and arranged under the four ‘cornerstone’ themes as shown in the diagram:
Connected Transport

AdaptIVe (Automated Driving)

Grant holder: Professor Natasha Merat
Investigators: Professor Richard Romano, Tyron Louw, Dr Ruth Madigan
Funded by: European Commission
Dates: April 2014 – June 2017
Collaborative partners: 28 partners in eight countries (see website for details)
Website: www.adaptive-ip.eu

Abstract: AdaptIVe develops various automated functions for daily driving by dynamically adapting the level of automation to different traffic situations and driver status. The focus of ITS Leeds partners is to investigate how the intentions of drivers and their actions should be taken into account in the design of automated systems.

CARTRE (Coordination of Automated Road Transport Deployment for Europe)

Grant holder: Dr Yvonne Barnard
Investigators: Dr Haibo Chen, Dr Dongyao Jia, Professor Natasha Merat
Funded by: EU H2020
Dates: October 2016 – September 2018
Coordinating partner: ERTICO – ITS Europe
Collaborating partners: 36 European partners (see website for details)
Website: http://connectedautomateddriving.eu/about-us/cartre/

Abstract: CARTRE is a Coordination and Support Action to accelerate development and deployment of automated road transport by increasing market and policy certainties. To achieve this, CARTRE will support the development of clearer and more consistent policies for EU Member States in collaboration with industry players, ensuring that automated road transport systems and services are compatible at EU level and are deployed in a coherent way.

Other objectives include: the creation of a solid knowledgebase of all European activities, to support current activities and structure research outcomes by enablers and thematic areas; to setup a platform for sharing and re-using data and experiences from different automated road transport systems; to actively support Field Operational Tests (FOTs) and pilots carried out at National and European levels; and to work on future visions, potential impacts and research gaps in the deployment of automated road transport.

The CARTRE project will run for two years and aims to establish a joint stakeholders forum in order to coordinate and harmonise automated road transport approaches at European (e.g. strategic alignment of national action plans for automated driving) and international level (in particular with the US and Japan).

Impact: As an overall impact, CARTRE supports the development of automation in road transport, in view of optimising its contribution to the ambitious EU policy goals in terms of road safety, reduced congestion, energy efficiency and air quality as well as ensuring the leading role of European industry in the global market to boost sustainable growth and create jobs.

City Mobil 2

Grant holder: Professor Natasha Merat
Investigators: Dr Ruth Madigan, Tyron Louw
Funded by: European Commission
Dates: September 2013 – August 2016
Collaborative partners: 45 partners (see website for details)
Website: www.citymobil2.eu/en

Abstract: CityMobil2 set up a pilot platform for automated road transport systems for implementation in several urban environments across Europe. Automated transport systems are made up of vehicles operating without a driver and which play a useful role complementing traditional vehicles on the main public transport network. Five sites in Europe each hosted a six-month demonstration. Vehicles for the demonstrations were supplied by selected manufacturers within the project. In addition to the pilot activities, research was undertaken into technical, financial, cultural and behavioural aspects as well as effects on land-use policies and how new systems can fit into existing infrastructure in different cities. The legal issues surrounding automated transport were also addressed, leading to a proposed framework for certifying automated transport systems. In this major collaboration our role at ITS was to study the interactions of road users (particularly pedestrians and cyclists) with driverless vehicles, using both questionnaire-based and quantitative video analysis.

EMPOWER

Grant holder: Professor Susan Grant-Muller
Investigator: Frances Hodgson
Funded by: EU H2020
Dates: May 2015 – April 2018
Collaborative partners: 11 European partners (see website for details)
Website: http://empowerproject.eu/

Abstract: The main objective of EMPOWER is to substantially reduce the use of conventionally-fuelled vehicles in cities, using positive incentives delivered through pervasive information technology such as smartphone, as part of a behavioural approach to demand management. To achieve this objective, EMPOWER will create a set of tools for industry, policy makers and employers. These will empower them beyond the lifespan of this project to understand, help choose and successfully implement ‘positive’ evidence-based and cost-effective policy interventions, based on new and innovative mobility
services, and in the context of already existing infrastructure, policy and measures. EMPOWER is working with over 40 stakeholders including cities, transport sector suppliers and incentive providers, and will demonstrate large scale implementation in four Living Labs: Manchester, Helsinki, Gothenburg and Enschede – plus a further seven take-up cities across Europe. The positive incentives being designed, trialled and implemented include: financial incentives, points and digital currencies, tangible rewards (such as prizes and vouchers), upgraded service offers and social incentives. Early deliverables include design features for the IT architecture and templates for business models in a multi-stakeholder context.

FOT-Net Data (Field Operational Test Networking and Data Sharing Support)

Grant holders: Dr Haibo Chen
Investigators: Professor Oliver Carsten, Dr Yvonne Barnard
Funded by: European Commission FP7 Dates: January 2014 – December 2016 Collaborative partners: VTT (co-ordinator), ERTICO, SAFER, IKA, PTV, CTAG, CESSAR and DAI
Website: http://fot-net.eu

Abstract: Objectives of this project were to: (1) support the efficient sharing and re-use of available Field Operational Test (FOT) datasets, (2) develop and promote a framework for data sharing and data re-use, (3) build a detailed catalogue of available data and tools and (4) operate an international networking platform for FOT activities.

Impact: The project has updated and promoted the FESTA methodology, maintained the FOT Wiki and reached an agreement on the adoption of data sharing principles.

This project received an ‘excellent’ rating in its final review and keeps the momentum of the FOT network, delivering new perspectives with regard to the sharing and re-use of globally available Naturalistic Driving Studies. The sharing of FOTnet datasets will yield further research results, create new collaborative options, generate financial and time savings in transport research, support education at high levels and contribute to the market introduction of improved vehicle ICT.

MARS Jakarta

Grant holder: Professor Simon Shepherd
Investigator: Dr Chandra Balijepalli
Funded by: Greater Jakarta Transport Authority (GJTA)
Dates: August 2016 to April 2017

Abstract: The capital region of the republic of Indonesia has 10% of its population of the nation. It has increased 1.6 fold in 20 years: from 17 million in 1990 to 28 million in 2010. The Jakarta region is the growth center with a share of approximately 30% of Gross Domestic Product and 40% foreign investment. Transportation in Greater Jakarta relies heavily on the road network and the surge in motorized vehicle traffic is tremendous. The worsening congestion in the region is causing huge economic loss. This project aims to develop a strategic Land Use Transport Interaction model based on the system dynamics model MARS. We have collaborated with the GJTA who supplied data and advice on which policy issues and objectives are most relevant to their master plans. The ultimate goal is to use the MARS model in a new environment (i.e. a new continent and cultural situation) and to develop an integrated master plan which helps meet the goals of improving welfare and growth while ensuring a more sustainable transport strategy.

The base model has been developed and training provided in the use of the MARS model to a delegation from Jakarta in November 2016. The final steps of the project are to validate the model and then assess the impact of various transport strategies to see which can provide best value for money and whether any strategy combinations can help obtain the goal of a 60% public transport mode share by 2030.

The Smarter Travel Solution

Grant holder: Astrid Gühnemann
Investigators: Haibo Chen, Jeremy Shires, Simon Shepherd, Dr Ian Philips
Website: STS

Abstract: The aim of the project is to develop a new travel app for smart phones that allows users to plan their journey. It’s an online, map-based, multi-modal journey planner that incorporates real-time travel and disruption information. It will also provide the option to book and pay for tickets, hire cars, use car club and provide feedback on the journey. The ITS input to this collaborative project is to look at the impact of the travel app in terms of carbon mitigation and what changes it will have on travel decisions in particular for vulnerable user groups.

Vehicle and Road Automation (VRA)

Grant holder: Natasha Merat
Funded by: European Commission Dates: November 2013 – December 2016 Collaborative partners: over 30 partners and associate partners (see website for details)
Website: http://vra-net.eu/

Abstract: VRA is a Support Action to create a collaboration network of experts and stakeholders towards the deployment of automated vehicles and related infrastructure. Professor Merat led the tri-lateral working group on human factors.
Inclusive Transport

**ADAPT**

**Grant holder:** Dr Kate Pangbourne  
**Investigators:** Dr Alex Baker-Graham  
**Funded by:** EPSRC  
**Dates:** June 2016 to May 2021  
**Website:** https://adapt.leeds.ac.uk/

**Abstract:** ADAPT is leading a new network, Arguments for Behaviour Change (ABC-NET) for researchers and practitioners interested in developing well-structured arguments for behaviour change. The aim is to establish a collaborative community to further research and practice in this area, with a particular emphasis on sustainability, well-being and resilience, and the use of ICT in delivering tailored, persuasive and ethical arguments for travel behaviour change. Over the life of the project, the ABC-NET will be the focal point for two academic colloquia intended to generate productive collaborations and raise the profile of the field.

Propensity to Cycle Tool (PCT)

**Grant holder:** Dr Robin Lovelace  
**Funded by:** DfT, ESRC  
**Dates:** February to August 2016  
**Collaborative partners:** Atkins, London School of Hygiene and Tropical Medicine, University of Cambridge, University of Westminster and Nikolai Berkoff, independent web developer  
**Website:** http://www.pct.bike/

**Abstract:** The PCT was designed to assist transport planners and policy makers in the prioritisation of investments and interventions to promote cycling. The PCT answers the question: ‘Where is cycling currently common and where does cycling have the greatest potential to grow?’ The PCT can be used at different scales – strategic and local.

The PCT is a strategic planning tool. Different visions of the future are represented through various scenarios of change, including the government’s draft Cycling Delivery Plan target to double cycling in a decade and the more ambitious ‘Go Dutch’ scenario, whereby Dutch cycling levels are reached in England (allowing for English hilliness and trip distances). By showing what the rate of cycling could feasibly look like in different parts of cities and regions, and illustrating the associated increase in cycle use on the road network, the PCT should inform policies that seek a wider shift towards sustainable transport.

Co-Motion (Co-design of the built environment for mobility in later life)

**Grant holder:** Bryan Matthews  
**Investigator:** Frances Hodgson  
**Funded by:** Research Councils UK (RCUK)  
**Dates:** September 2013 – January 2017  
**Coordinating partner:** University of York  
**Collaborative partners:** University of Newcastle, University of Northumbria

**Abstract:** The project conducted interviews with older people to explore their mobility and wellbeing over time and life changing events. Participants were involved in the research through a series of workshops and co-design sessions to help develop and test innovations such as crowd sourcing about mobility barriers, mobility apps, adaptations to mobility scooters. The aim was to help overcome conflicts between the needs of different people in the urban space.

**Impact:** The project has co-created practical tools which can complement or act as alternatives to the redesign of the built environment. Please see the Co-motion project website for details.

Viajeo Plus  
(International coordination for implementation of innovative and efficient urban mobility solutions)

**Grant holder:** Dr Haibo Chen  
**Investigator:** Dr Paul Timms  
**Funded by:** European Commission FP7  
**Dates:** May 2013 – April 2016  
**Website:** http://viajeoplus.eu

**Abstract:** This project collected good practices in the promotion of integrated network management (including multimodal interchanges), public transport, intelligent infrastructure, clean vehicles, and urban logistics in Europe and beyond. We exchanged experience and knowledge between global cities and produced a ‘Virtual Solution Book’ showcasing best practices ranging from flexible cycling facilities in Sao Paolo, through bus rapid transit, tram projects and multimodal interchanges across the globe to traffic demand management in Beijing.
The PCT can also be used at a smaller scale. The scenario level of commuter cycling along a particular road can be used to estimate future mode share for cycling on that corridor. This can be compared with current allocation of space to different modes, and used to consider re-allocation from less sustainable modes to cater for cycling growth. In other cases, low current or potential flows may indicate a barrier, such as a major road or rail line, causing severance and lengthening trips. This could be addressed through new infrastructure such as a pedestrian and cycle bridge.

Underlying the PCT is open source software development led by Robin Lovelace, who created the R package stplanr to empower people worldwide with accessible tools for reproducible transport planning research.

In summary the PCT is a planning support system to improve cycling provision at many levels from whole regions to specific points on the road network. For further information on the thinking underlying the tool’s design, and the methodology used to create it, please see the paper quoted below. To view the underlying source code please visit Github/npct.

Papers:

### Shaping London’s Air Quality Strategy

**Grant holder: Dr James Tate**  
**Funded by:** Transport for London (TfL)  
**Dates:** October 2013 – May 2016

**Impact:** Dr Tate’s extensive vehicle emissions measurements on behalf of Local Authorities across the UK and in particular, his report that diesel vehicles are more polluting within cities than manufacturer’s specifications would have us believe, resulted in his secondment to TfL. Dr Tate is working with TfL’s Environmental Policy and Strategy Team to support the on-going development of the capital’s ‘Transport and Emissions Action Plan’ that can take better account of congested driving conditions. Dr Tate brings the latest research developments and international evidence to enhance the road transport air pollutant evidence base and facilitate the application of emerging research methodologies to the Greater London road transport network.

Transport Equity Assessment (TEA COST)

**Grant holder:** Professor Karen Lucas  
**Funded by:** EU COST Action  
**Dates:** April 2013 to April 2017  
**Collaborative partners:** 15 partner countries of the TEA COST consortium  
**Website:** [www.cost.eu/COST_Actions/tud/TU1209](http://www.cost.eu/COST_Actions/tud/TU1209)

**Abstract:** Understanding the equity implications of transport policies and investments is becoming increasingly important, as underscored by social movements around the world. A major challenge in the assessment and appraisal of transport projects and policies is that equity issues are currently hardly addressed. The TEA COST Action develops new approaches that incorporate equity consideration in transport project evaluation and decision making. This includes the measurement of accessibility combined with the literature on social justice, travel behaviour models and socio-economic impact analysis in line with mainstream welfare economics. TEA COST has three main purposes: i) to develop innovative and comprehensive transport evaluation criteria that account for distributional effects and accessibility; ii) to include social and spatial factors in social welfare assessment; iii) to devise a common European methodology that links equity indicators and social welfare maximization in order to promote equity considerations in transport decision making. It will achieve this by promoting a series of knowledge exchange workshops between academics and policymakers in the 15 partner countries that form the TEA COST Consortium.

**VENI**

**Grant holder:** Dr Eva Heinen  
**Funded by:** Dutch Research Council  
**Dates:** January 2014 – December 2017

**Abstract:** Reducing car use and encouraging people to walk, cycle or use public transport seems almost impossible to achieve despite extensive academic and policy attention. Change may be effected, but calls for a different methodological approach to the complexity of behaviour, and a focus that goes beyond the current emphasis on theories concerning rational choice. This project aims to tackle the problem using a novel methodological approach and focussing on differences in behaviour from journey to journey within individuals. It is recognised that identities could prevent behavioural change, as a threat to one’s identity causes resistance to change. This research will make a major contribution towards effective strategies to achieve more sustainable transport.

**Papers:**


XCYLE

**Grant holder:** Professor Oliver Carsten  
**Investigators:** Dr Daryl Hibberd, Professor Richard Romano, Michael Daly  
**Funded by:** EU H2020  
**Dates:** June 2015 – November 2018  
**Coordinating partner:** University of Bologna  
**Collaborating partners:** Nine European industry and academic partners (see website for details)  
**Website:** [www.xcycle-h2020.eu/](http://www.xcycle-h2020.eu/)

**Abstract:** This project aims to find the means to equalise the treatment of cyclists in traffic and thus both encourage cycling and make cycling safer. The project will contribute to innovative and efficient advanced safety measures to reduce the number of accidents involving cyclists in interaction with motorised vehicles. The project will develop technologies aimed at improving active and passive detection of cyclists, systems informing both drivers and cyclists of hazards at junctions, effective methods of presenting information in vehicles and on-site and cooperation systems aimed at reducing collisions with cyclists. To this end, the University of Leeds has developed an in-vehicle HMI to warn truck drivers of imminent collision risk. The work is being carried out on a new truck simulator, developed with University funding.

**Impact:** There will be large impacts on cycling safety by addressing some of the most severe collision scenarios.

Productive Transport

CQC Efficiency Network

**Grant holder:** Dr Phill Wheat  
**Investigator:** Alex Stead  
**Coordinating partners:** Measure 2 Improve  
**Funded by:** Local Authorities  
**Dates:** April 2015 – December 2018  
**Website:** [http://nhtnetwork.org/cqc-efficiency-network/home/](http://nhtnetwork.org/cqc-efficiency-network/home/)

**Abstract:** The CQC Efficiency Network (Cost, Quality, Customer) is an offering to local authorities throughout Britain to enable them to quantify the scope for cost savings in the delivery of highway services and to identify better practices. Importantly the analysis recognises the interplay between the Cost of work done, the Quality of the work and the Customer perception of the highway service. The CQC Efficiency Network is a joint venture between the National Highways & Transport Network (NHT) and the University of Leeds. Both partners worked successfully together in two pilot studies of this approach funded by HMEP.

**Impact:** The network is helping local authorities improve their cost performance, whilst at the same time maintaining the quality of their offering. The work has identified substantial opportunities for savings. The CQC network provides evidence to support enhanced central government funding as a reward to local authorities who adopt efficient practices.

CTS New Guest Researcher

**Grant holder:** Professor Andrew Smith  
**Funded by:** Centre for Transport Studies (CTS), Royal Institute of Technology (KTH) and Swedish National Road and Transport Research Institute (VTI), Sweden  
**Dates:** December 2015 – November 2016

**Abstract:** This appointment continued from previous visiting arrangements dating back to 2009 and developing new collaborations across CTS, moving beyond previously reported research in rail marginal cost and efficiency (though continuing to develop research and projects in the rail area). The arrangement involved several visits to Stockholm, a presentation of research (empirical and methodological), plus collaboration on key papers.

DITTO

**Grant holder:** Dr Ronghui Liu  
**Investigators:** Dr Anthony Whiteing, Dr Hongbo Ye  
**Funded by:** Railway Safety & Standards Board  
**Dates:** September 2014 – August 2017  
**Coordinating partner:** University of Southampton

**Abstract:** DITTO (Developing Integrated Tools to Optimise Railway Systems) is a multi-disciplinary project bringing together University-based traffic engineers and transport operations researchers (from Leeds and Southampton) and computer scientists (from Swansea). The project contributes to the Future Traffic Regulation Optimisation (FuTRO) programme by establishing relevant basic principles and proofs of concept for the optimisation of rail operations. Our objective is to develop the formulations, algorithms and processes that will deliver a step-change in rail system performance and meet future customer needs. This is done by taking into account developments in human and automatic control on trains and in control centres and by making better use of data, particularly with respect
to the time and position of trains. The Leeds team is developing network simulation models to design and test real-time operations of FuTRO systems, in particular train control algorithms for the new ERTMS (European Rail Traffic Management System) Levels 2 and 3.

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### Economics of Connectivity

**Grant holder:** Dr James Laird  
**Funded by:** ECPC Ltd New Zealand  
**Dates:** November 2015 – April 2016  
**Collaborating partners:** Infometrics Ltd

**Abstract:** The concept of network connectivity and its role in providing for economies of scale for individuals and firms across nodes (locations) has recently been identified. However, there is little research on understanding the value of network connectivity and its role in productivity, in particular through the provision of transport links between nodes. This research estimated the economic impacts of inter-urban land based connectivity between Auckland, Hamilton and Tauranga, particularly around air and sea ports. The project developed a General Equilibrium model capable of responding to the effects of changes in network connectivity.

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### HS2 Economic Advisory Panel

**Grant holder:** Dr James Laird  
**Funded by:** HS2 Ltd  
**Dates:** November 2015 – September 2016

**Abstract:** The Economic Advisory Panel assisted HS2 Ltd in scoping and designing a programme of work to deliver robust and credible analysis on the potential impact of HS2 on the economy, particularly at a sub-national or regional level. The existing methodology used to assess the economic case for HS2 had focused on appraisal at the national level, in line with WebTAG guidance. In this project we conducted an analysis of sub-national and regional impacts of the HS2 scheme.

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### Land Value Uplift phase 1

**Grant holder:** Dr John Nellthorp  
**Investigators:** Dan Johnson, Dr Manuel Ojeda-Cabral, Dr James Laird  
**Funded by:** West Yorkshire Combined Authority (WYCA) and University of Leeds  
**Dates:** June to December 2016  
**Co-ordinating partner:** ITS

**Abstract:** The aim of this scoping study was to produce a targeted piece of theoretical and practical research which will advance the understanding of the wider economic impacts of transport – in particular land and property uplift. Key research questions were around: how to treat these impacts in appraisal and policy analysis; the types of models needed; the likely size and pattern of the impacts. The research crosses the agendas of transport, housing and regional economic development, and is of direct interest to the co-sponsor WYCA and to the wider set of organisations who attended the national Workshop at the conclusion of the scoping study.

**Papers:** Response to the DfT Consultation on Wider Economic Impact Appraisal

**Impact:** The National Workshop on Transport and Land Value Uplift was held at the Institute for Transport Studies on 16 Dec 2016 and generated much interest among delegates from DfT; TfL; TfN; WYCA; TfGM; National Infrastructure Commission; JLL; Leeds City Council; Cushman & Wakefield; Leeds Chamber of Commerce.

It is intended to take the work forward in a second phase, bringing together the needs and requirements of a wider set of authorities and interested parties, and developing further the methods established in phase one.

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### Liberalisation of Passenger Rail Services

**Grant holder:** Professor Chris Nash  
**Co-Investigator:** Professor Andrew Smith  
**Funded by:** Centre on Regulation in Europe (CERRE)  
**Dates:** July to December 2016  
**Collaborative partners:** Professor Yves Crozet (France), Dr Heike Link (Germany), Professor Jan-Eric Nilsson (Sweden)

**Abstract:** Where it has occurred, liberalisation of passenger rail services in Europe has largely been successful, bringing with it, improved services, increased traffic and reduced support from public finances. This report offers lessons for markets that are yet to be liberalised. It also points to a number of key questions and difficult issues that policy-makers will have to address.

In markets, such as France, which have yet to undergo liberalisation, the report identifies a number of trade-offs to be faced by policy-makers. These include:

- Choosing a path to liberalisation – through competitive tendering for public service contracts, or open access for the operation of commercial services, or some combination of the two;
- Deciding which levels of government should be responsible for competitive tendering: devolving this to regional administrations or maintaining central coordination;
- Determining the optimal size and duration of franchises to maximise economies of scale and density;
- Allocating risk-sharing between private operators and the state;
- Dealing with the political and social implications of potentially transferring large numbers of public-sector staff to private companies.

**Papers:** The report was presented at an executive seminar held by CERRE in Brussels to an audience from the European Commission, the rail industry and policy makers from Member States on 7/12/2016. The final report is available at www.cerre.eu/publications/liberalisation-passerger-rail-services
**Impact:** CERRE Director General, Professor Bruno Liebhaberg, says: “Through its wide geographical scope, its robust analyses and its clear policy recommendations, this new CERRE report highlights the benefits of liberalisation, to both users and taxpayers, in the countries where that process has been completed. As such, it should provide a valuable contribution to the current debate around rail transport reform which is currently going on in many Member States.”

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**NeTIRail**

**Grant holder:** Professor Andrew Smith  
**Investigators:** Dr James Laird, Dr Phill Wheat, Dr Dan Johnson  
**Funded by:** EU  
**Dates:** June 2015 – May 2018  
**Collaborative partners:** University of Sheffield (co-ordinator), University of Leeds, VTI, UIC, ADS Electronic, AFER, TU Delft, IFSTTAR, TCCD, ALU FR, Intader, SZ, RCCF  
**Website:** [http://www.netirail.eu](http://www.netirail.eu)

**Abstract:** The main purpose is to develop and demonstrate technologies and best practice tailored to the needs of different categories of rail systems – including busy capacity-limited passenger lines, under-utilised rural or secondary “low density” lines and routes dominated by freight. The consortium will deliver innovative concepts of new technologies for railway operation and analyse current best practice to identify optimal solutions to be applied to different line categories across Europe. Moreover, it will also assess the societal impact of railway and the business case for each alternative asset management strategy and the applications of the technologies developed, including consideration of the incentives and regulatory financial frameworks across the EU member states. Our contribution to this large project involves establishing the business case and associated cost, demand modelling and undertaking research on incentives and regulatory aspects.

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**Network Rail Secondment**

**Grant holder:** Dr Ronghui Liu  
**Funded by:** EPSRC Impact Acceleration Account  
**Dates:** May 2015 – March 2016

**Abstract:** Network Rail’s Digital Railway Division (NR-DRV) was formed in 2015 to tackle the specific demand to move the UK railway system to the standards set out for the European Rail Traffic Management Systems (ERTMS).

**Impact:** By playing a significant role in supporting and shaping the development of Network Rail’s Digital Railway, Dr Liu’s secondment laid the foundations for substantive and ongoing relationships between Network Rail and the University of Leeds which will precipitate further collaborative opportunities over the coming years.

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**Steel composition and track degradation**

**Grant holder:** Professor Andrew Smith  
**Investigators:** Professor Richard Batley, Dr James Laird, Dr Phill Wheat  
**Funded by:** Engineering and Physical Sciences Research Council (EPSRC)  
**Dates:** July 2015 – June 2017  
**Collaborative partners:** University of Huddersfield (co-ordinator), University of Cambridge, Cranfield University, Tata Steel, involvement also from Network Rail and RSSB.

**Abstract:** The main purpose is to develop and demonstrate technologies and best practice tailored to the needs of different categories of rail systems – including busy capacity-limited passenger lines, under-utilised rural or secondary “low density” lines and routes dominated by freight. The consortium will deliver innovative concepts of new technologies for railway operation and analyse current best practice to identify optimal solutions to be applied to different line categories across Europe. Moreover, it will also assess the societal impact of railway and the business case for each alternative asset management strategy and the applications of the technologies developed, including consideration of the incentives and regulatory financial frameworks across the EU member states. Our contribution to this large project involves establishing the business case and associated cost, demand modelling and undertaking research on incentives and regulatory aspects.

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**What Works Centre for Local Economic Growth: Transport**

**Grant holder:** Professor Karen Lucas  
**Funded by:** Economic and Social Research Council (ESRC), London School of Economics  
**Dates:** September 2013 – February 2017  
**Website:** [www.whatworksgrowth.org](http://www.whatworksgrowth.org)

**Abstract:** The main purpose is to develop and demonstrate technologies and best practice tailored to the needs of different categories of rail systems – including busy capacity-limited passenger lines, under-utilised rural or secondary “low density” lines and routes dominated by freight. The consortium will deliver innovative concepts of new technologies for railway operation and analyse current best practice to identify optimal solutions to be applied to different line categories across Europe. Moreover, it will also assess the societal impact of railway and the business case for each alternative asset management strategy and the applications of the technologies developed, including consideration of the incentives and regulatory financial frameworks across the EU member states. Our contribution to this large project involves establishing the business case and associated cost, demand modelling and undertaking research on incentives and regulatory aspects.

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They are, however, consistent with other research on the economic impact of transport improvements.

**Impact:** A report of the initial evidence review can be found at www.whatworksgrowth.org/policy-reviews/transport/The next stage of the study will be to develop a toolkit of interventions that will help to guide local transport authorities and other investors on what works for economic growth in the local transport sector.

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**Resilient Transport**

![Image of a charging station]

**CH4LLENGE**

**Grant holder:** Dr Caroline Mullen  
**Investigators:** Professor Tony May, Professor Simon Shepherd, Dr Astrid Gühnemann  
**Funded by:** European Commission Intelligent Energy Europe Programme  
**Dates:** March 2013 to March 2016  
**Collaborative partners:** 16 partners across the EU (see website for details):  
**Website:** www.sump-challenges.eu

**Abstract:** Planning for urban transport must increasingly consider how to improve energy efficiency, reduce greenhouse gas emissions and improve local economies and quality of life for residents. A Sustainable Urban Mobility Plan (SUMP) is designed to contribute to these ambitions for urban transport and its impacts on social inclusion, economy and environmental targets. In this project we have extended knowledge to support cities in planning, implementing and evaluating SUMPs. Working with cities has provided new insights and knowledge drawn from their experiences and pilots such as pedestrianisation, and evaluation of participation in the City Connect project.

**Papers:**  


**Impact:** Pilot projects in each of the eight partner cities will have tangible impacts for significant aspects of sustainable urban mobility planning. The project has contributed to major development of the KonSULT option generator plus freely available manuals and online resources to support learning and professional development for planners across Europe and beyond.

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**ClimateXChange**

**Grant holder:** Professor Jillian Anable  
**Investigators:** Dr Craig Morton  
**Funded by:** Scottish Government  
**Dates:** May 2016 to October 2017  
**Website:** www.climatexchange.org.uk/

**Abstract:** This project delivers timely evidence and recommendations to the Scottish Government concerning its climate change mitigation policies across two principle areas of investigation. Firstly, by charting and understanding the factors that underpin the adoption of low-carbon technologies such as hybrid and electric vehicles. Second, by considering the motivations of citizens to make use of more sustainable modes of transport. These areas of investigation are pursued through the application of spatial regression modelling and psychological modelling in order to uncover new insights on how to shift Scotland’s transport sector onto a sustainable trajectory.

**Papers:**  


**Impact:** Research associated with this project has been presented to the Scottish Government at a number of conferences, meetings and workshops. In addition, a series of policy notes have been produced and disseminated.
by the ClimateXChange centre which summarise the key policy relevant findings of the project.

Crossmodal

Grant holder: Dr Jeremy Toner
Funded by: Norwegian Research Council
Dates: October 2015 – June 2018
Coordinating partner: The Institute of Transport Economics, Norway (TØI)
Collaborating partner: Mark Wardman (SYSTRA)

Abstract: Mode shift is at the core of sustainable transport planning in all world cities; yet we know comparatively little about it. The Crossmodal project seeks to improve our understanding of demand effects across different transport modes: How and to what extent policies which change demand for one transport mode (e.g. bus) also affect demand for other modes (e.g. car). Crossmodal develops new and policy-relevant understanding of passengers’ mode-switching behaviour through improved theoretical understanding, better methodological approaches and new empirical evidence.

Impact: The Commission on Travel Demand has attracted evidence from the DIT, Committee on Climate Change, Civil Aviation Authority and several core cities as well as from consultant practitioners and academics.

ecoDriver

Grant holder: Professor Samantha Jamson
Investigators: Professor Oliver Carsten, Dr John Neilthorp, Dr Daryl Hibberd, Dr Astrid Guehnemann (and several others in previous years)
Funded by: European Commission
Dates: October 2011 – March 2016
Collaborative partners: 11 European partners (see website for details)
Website: www.ecodriver-project.eu

Abstract: Road transport contributes about one-fifth of total CO2 emissions in the EU. Advances have been made in terms of cleaner vehicles, traffic management, efficiency and intermodality, but the final link is the driver. This project aimed to reduce carbon emissions and fuel consumption by encouraging the adoption of green driving behaviour. This was done by developing and extensively testing a range of driver support systems for cars and commercial vehicles.

Impact: The results from our trials indicate that there are substantial fuel and energy savings to be obtained when drivers are given precisely tailored advice on green speed and gear, as well as given foresight of how to drive when approaching a particular road or traffic situation. The driver support systems can make a real contribution to reducing the carbon impact of road transport as well as saving fuel costs. The systems also deliver important safety benefits by encouraging drivers to reduce their speed. A number of vehicle manufacturers have incorporated ecoDriver concepts into their vehicles: BMW’s ecoAssist incorporates a new HMI dashboard and an automated coasting mode when the driver is not using the accelerator pedal. In CRF’s system the HMI solutions are both visual & visual combined with a haptic pedal. Daimler has developed a new ecoDriver app consisting of a map-based driving strategy with a visual & haptic (accelerator pedal) HMI. EcoDriver prototype systems bring energy savings of up to 6%. This project received an ‘excellent’ rating in its final review.

Emissions Detecting and Reporting (EDAR)

Grant holder: Dr Karl Ropkins
Funded by: Transport Systems Catapult
Dates: October 2016 (EDAR phase 1.2)
Collaborating partners: University of Birmingham

Abstract: EDAR is a new-to-market passive passing-vehicle emission measurement system developed and commercialised by US company Hager Environmental and Atmospheric Technologies (HEAT) who claim that EDAR has superior sensitivity by comparison to other similar technologies. Early findings from independent tests implemented by the US Environmental Protection Agency appear to support this claim. The Universities of Birmingham, Leeds and King’s College London undertook a demonstration/evaluation study to provide complementary real-world evidence regarding EDAR performance in the UK. The second phase of that
work, provides an analysis of datasets collected as part of the first round EDAR deployments.

Papers: Early US and UK findings are presented in:


A more detailed discussion of findings has also been submitted for inclusion in the Science of the Total Environment (STOTEN) Special Issue on In-use Testing post ‘Dieselgate’.

Energy-related economic stress in the UK

Grant holder: Professor Greg Marsden Investigators: Dr Giulio Mattioli, Professor Karen Lucas, Professor Jillian Anable Funded by: Engineering and Physical Sciences Research Council (EPSRC)

Dates: November 2014 April 2016
Website: https://teresproject.wordpress.com/

Abstract: The outcome of the project is three sets of indicators of ‘car-related economic stress’ and vulnerability to motor fuel price increases, based on different data sources (Living Costs and Food Survey, EU Income and Living Conditions Survey, MOT tests data and Accessibility Statistics). Our findings suggest that the affordability of motoring costs is an issue affecting a non-negligible number of households – in the range of 2 million in the UK. The working poor and households on the edge of inclusion are particularly at risk. Households with low incomes and high motoring costs have the most inelastic demand for fuel, which means that they have high exposure, high sensitivity and low adaptive capacity to fuel price increases. Car-related economic stress is also associated with economic precarity and material deprivation in other areas of life, as households may cut on domestic heating or incur debt in order to afford motoring costs. Our spatial analysis shows that London and the South East are relatively resilient to increases in fuel prices, while suburban and peri-urban areas in the North of England are rather vulnerable.

Papers:


Impact: The research has been presented to non-academic and policy-making audiences in events organized by the Scottish Government, RAC Foundation and the Department for Transport, receiving very positive feedback. The possibility of further funding for follow-up research is currently being discussed. We published a briefing note targeted at a non-academic public on the project website. A special issue of Transport Policy on the themes of the project will be published in 2017, collecting articles from a range of countries and disciplines.

Forth Road Bridge Closure


Abstract: This project follows on from the Disruption project (above). When the Forth Road Bridge in Edinburgh suffered an unexpected structural failure, closing it to all traffic, the tools and insights previously developed at ITS were put into action. The research provided insights to Transport Scotland and ScotRail on likely behavioural responses from previously assembled data sets. We also conducted 1,500 surveys of households and users of alternative rail and bus services, and 50 business surveys. A major new report on behavioural responses to disruption was commissioned by the OECD International Transport Forum and a workshop held for Transport Scotland.

Papers:


Impact: The work influenced both the responses of Transport Scotland during the event and their learning following the event.

Infrastructures for online shopping: integrating supply and demand

Grant holder: Professor Greg Marsden Investigators: Dr Anthony Whiteing, Dr Ian Jones Funded by: Research Councils UK, EDF R&D, Transport for London (TfL) Dates: September 2015 – August 2017

Abstract: The trend towards online shopping will result in changes to transport demand, for both personal travel and freight movement. This will have important implications for
future energy demand. We will collect data from consumer focus groups and household surveys as well as from retailers and logistics service providers. The data will be analysed to gain insights into how households expect to shop in the future particularly for non-grocery items, and how logistics systems will respond to such changes. The analysis will inform how energy use both in households and industry will change as a result of online shopping.

**Motoring and vehicle Ownership Trends (MOT)**

*Grant holder: Professor Jillian Anable
Funded by: EPSRC
Dates: October 2013 to March 2017
Collaborating partners: Department for Transport, University of Aberdeen, University of Bristol, University of the West of England.*

**Website:** [www.motproject.net](http://www.motproject.net)

*Abstract:* Efforts to reduce emissions from car travel have so far been hampered by a lack of specific information on car ownership and use. The MOT project seeks to address this by bringing together new sources of data to give a spatially disaggregated diagnosis of car ownership and use in Great Britain and the associated emissions and energy demands.

Data from annual car roadworthiness tests (‘MOT tests’ in the UK), made available by the Department for Transport, together with additional details of all vehicles registered from the UK Driver Vehicle Licensing Agency is used as a platform upon which to undertake a set of inter-linked modelling and analysis tasks.

**Papers:**


**Impact:** The project has developed the capability to understand spatial differences in car ownership and use and has the potential to transform the way in which energy and emissions are quantified, understood and monitored. This will help refine future research and policy agendas and inform transport and energy infrastructure planning.

**Next Generation Driving Behaviour Models**

*Grant holder: Dr Charisma Choudhury
Investigators: Dr Daryl Hibberd, Michael Daly, Evangelos Paschalidis
Funded by: EU-Marie Curie
Dates: May 2015 – January 2019*

*Abstract:* We aim to develop dynamic driving behaviour models that explicitly account for the effects of driver characteristics in driver decisions alongside the effects of path-plan, network topography and traffic conditions. In a novel approach, the project will calibrate our driving behaviour models by combining experimental data collected from the University of Leeds Driving Simulator and actual traffic data collected using video recordings. Particular emphasis of these models are to capture how stress levels impacts driving decisions and vice versa.

**Papers:**


**OptiTruck**

*Grant holder: Dr Haibo Chen
Investigators: Dr Yvonne Barnard, Dr Dongyao Jia, Dr Richard Connors, Professor David Watting
Funded by: EU Horizon2020
Dates: September 2016 to August 2019
Coordinating partner: ERTICO
Collaborating partners: Ten partners in industry and academia (see website for details)*

**Website:** [http://optitruck.eu/](http://optitruck.eu/)

*Abstract:* The automotive industry has developed powertrain technologies to improve the fuel efficiency of Heavy-Duty Vehicles (HDVs). However, due to increasing road freight, total HDV energy use and CO2 emissions are expected to remain undiminished if no policy action is taken. The goal of optiTruck is to combine the most advanced technologies from powertrain control with intelligent transport systems in order to achieve a 20% global reduction of energy consumption, while achieving Euro VI emission standards, for heavy duty road haulage.

**Powering the Powerhouse**

*Grant holder: Professor Simon Shepherd
Investigators: Dr Zia Wadud
Funded by: Impact Acceleration Account and Future Cities Catapult
Dates: January 2016-September 2016
Collaborative partners: Future Cities Catapult, Leeds Sustainability Research Institute*

*Abstract:* There is huge potential to link electric vehicles, local energy systems, and personal mobility in the city. By doing so we can improve air quality, tackle climate change, support the green economy and grow new business models. Many studies and ‘roadmap’ projections do not consider the role of business model innovation as critical to the uptake of electric or alternative fuel vehicles. This research is different, in that it takes seriously the role of business model innovation as an enabler of e-mobility futures.
New e-mobility business models can link three important sectors that have previously operated in isolation from one another; the auto industry, energy systems and transport infrastructure. It is vital that new e-mobility business models are investigated, since recent research shows that current city-level policies are having little effect on stimulating electric vehicle uptake. New e-mobility business models have to work across the boundaries of these three large systems. We call this the ‘Innovation Interface’, where new products, services and commodities are offered by new partnerships between cities, the energy system, and the auto industry.

This research presents ten business models that work at the Innovation Interface. Some offer more benefits to the energy system, some are most positive for the auto industry, and others link together city transport infrastructures more effectively.

The key outcome of this project was a stakeholder facing report on the opportunities for linking electric vehicles, the energy system, and transport infrastructures in cities. The report was publicised via an article in The Conversation. The article and report were well received on social media and by industry. The promotion of the report has led to invitations from the Auto industry, government, and the energy industry to present the findings of the study in person and seek further collaboration.

Papers:

Impact: The Authors have been invited to present their work at the Energy UK working group on electric vehicles. Energy UK is a consortium of the largest energy utilities and this work aims to inform commercial strategies of this group.

Programme for Simulation Innovation (PSI)
grant holder: Dr Gustav Markkula
investigators: Professor Richard Romano, Dr Hamish Jamson, Tony Horrobin, Dr Andrew Tomlinson, Ehsan Sadraei and Panagiotis Spyridakos
funded by: EPSRC, Jaguar Land Rover (JLR)
dates: April 2013 – December 2017
Collaborative partners: Dr Erwin Boer-independent researcher; Universities of Loughborough, Warwick, Cambridge, Sheffield and Manchester.

Abstract: PSI is developing capabilities in advanced simulation to support a virtual vehicle design process and to reduce the reliance on physical prototypes. If a vision of zero physical prototypes is ever to be realised, then the process of digital design and verification needs to encompass not just the physical dimensions of component and system functionality, but also the driver’s perceptual experience. In a very rare set of experiments, involving engineers and professional test drivers from a number of different groups within JLR, selected vehicle testing tasks have been re-created in the University of Leeds Driving Simulator, scaled to different levels of fidelity. By modelling and comparing driver behaviour and test outcomes obtained in these simulator trials to corresponding results with physical prototypes, a Simulator Functionality Matrix is being established, quantifying the required simulator characteristics per type of vehicle testing. The targeted testing domains have been selected for large potential of savings in time and cost of vehicle development.

Papers:

UDRIVE
Grant holder: Professor Oliver Carsten
Investigators: Dr Daryl Hibberd, Dr Frank Lai
funded by: European Commission
dates: October 2012 – June 2017
Collaborative partners: 19 partners across 11 countries, see website for details
Website: www.udrive.eu

Abstract: UDRIVE is the first large-scale European Naturalistic Driving Study – observing drivers in their everyday driving routines and behaviours within a fleet of 200 vehicles (cars, trucks and powered-two wheelers). It aims at enhancing in-depth understanding of actual road user behaviour by means of field observations. The objectives are to identify measures that improve road safety and to identify ways for reducing vehicle emissions and fuel consumption. At Leeds we are involved in all stages of the project, including study design, field trials, data analysis and dissemination. With the driving simulator facility we are examining how the choices that drivers make second-by-second are linked to risk including the uptake of in-vehicle secondary tasks.
Increasingly, our research publications are available via Open Access so that the outcomes of publicly funded research are more widely and freely available.
study of Beijing, Applied Mathematical Modelling, 40 8048-8066.


Hazelton M, Watling D (2016, Guest Editors). Editorial, Special Issue: Day-to-day dynamic traffic assignment models, EURO Journal on Transportation and Logistics, 5 1-3.


Kountouriotis GK, Merat N (2016) Leading to Distraction: Driver distraction, lead car, and road environment, Accident Analysis and Prevention, 89 22-30.


Liang XH, Tan KH, Whiteing A, Nash C, Johnson D (2016) Parcels and mail by high speed rail-A comparative analysis of Germany, France and China,
Journal of Rail Transport Planning and Management, 6 77-88.


Lovelace R (2016) BOOK REVIEW David Boyle and Huw Williams Forecasting urban travel: Past, present and future, Environment and Planning B: Planning and Design, 44.


Naimanye AG, Whiteing T (2016) Poverty-centred rural road funds


Nugroho MT, Whiteing A, de Jong G (2016) Port and inland mode choice from the exporters’ and forwarders’ perspectives: Case study Java, Indonesia, Research in Transportation Business and Management, 19 73-82.


Ojeda-Cabrals M, Chorus C (2016) Value of travel time changes: theory and simulation to understand the connection between random valuation and random utility methods, Transport Policy, 48 139-145.


Pariot L, Galante F, Bifulco GN (2016) Heterogeneity of driving behaviors in different car-following conditions, Periodica Polytechnica Transportation Engineering, 44 105-114.


Prins RG, Panter J, Heinen E, Griffin SJ, Ogilvie DB (2016) Causal pathways linking environmental change with health behaviour change: Natural experimental study of new transport infrastructure and cycling to work, Preventive Medicine, 87 175-182.


Sayegh A, Tate JE, Ropkins K (2016) Understanding how roadside concentrations of NOx are influenced by the background levels, traffic density, and meteorological conditions using Boosted Regression Trees, Atmospheric Environment, 127 163-175.


Uttley J, Lovelace R (2016) Cycling promotion schemes and long-term behavioural change: A case study from the University of Sheffield, Case Studies on Transport Policy, 4 133-142.
Versus Management Deficiency, Fire
Bangladesh: Structural Inadequacy
in the Readymade Garment Sector in
Wadud Z, Huda FY (2016) Fire Safety
165 849-857. Applied Energy,
Estimates for different vehicle types,
the road freight sector in the UK:
Wadud Z (2016) Diesel demand in
Transportation, 43 705-724.

Wadud Z (2016) Diesel demand in
the road freight sector in the UK: Estimates for different vehicle types, Applied Energy, 43 705-724.


Xu M, Grant-Muller S (2016) Trip mode and travel pattern impacts of a Tradable Credits Scheme: A case study of Beijing, Transport Policy, 47 72-83.


CONFERENCE PAPERS


BOOKS AND BOOK CHAPTERS


REPORTS


Mullen CA (2016) Freedom of movement and fairness: Transforming transport planning for social and environmental justice; thinkpiece for Friends of the Earth Big Ideas project.

Nash CA (2016) Liberalisation of passenger rail services. CERRE project report.

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