

# Centre for Transport and Society, University of the West of England, Bristol

## Annual Report 2012

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[www.uwe.ac.uk/research/cts](http://www.uwe.ac.uk/research/cts)

### OVERVIEW

The mission of the Centre for Transport & Society (CTS), a research centre of the Department of Planning and Architecture at the University of the West of England, Bristol (UWE) is to *further understanding and influence on the interactions between mobility, lifestyles and society in a context of technological change.*

At the end of 2012, CTS comprised 11 staff members, 10 research students and six emeritus and visiting members. In addition, colleagues from departments across UWE are engaged as 'Collaborating Members'. The interdisciplinary team has a shared interest in travel behaviour and mobility equity issues, and in relating the understanding gained from research to policy and practice.

Alongside our research activities we run a successful MSc Transport programme, which is accredited by the Chartered Institute of Logistics and Transport (CILT) and as a specialism by the Royal Town Planning Institute (RTPI). The course is designed to provide individuals with the core skills needed in transport planning practice whilst seeking to offer a distinctive orientation in its teaching which exposes students to the challenges posed by placing transport in its socio-political and behavioural context. Whilst the focus of the course has great relevance for transport planning internationally, graduates have been successful in achieving the recently introduced 'Transport Planning Professional' qualification, affirming the UK relevance of the syllabus.

2012 began for CTS with the Universities' Transport Study Group Conference in Aberdeen, at which members presented a dozen of the 80 papers, including a plenary paper by collaborating member

Tim Chatterton. In March the Centre co-hosted with CILT's Southwest Branch public lectures by Leon Daniels, Managing Director Surface Transport, Transport for London, concerning transport-sector preparations for the London 2012 Olympic Games, and by Graham Dalton, Chief Executive, Highways Agency, on the topic of achieving value-for-money on the road network.

In July a further event was convened with CILT-SW: the annual dissertation showcase. Simon Moody of PFA Consulting received first prize for the high-scoring dissertation submitted in 2011 titled 'How do pedestrians move in a shared space scheme with high traffic flows?', whilst Ryan Bunce, Somerset County Council took a very strong second place with 'Where next? How cyclists really find their way around: psychology, practice and (real) people'. Rosemary Starr (Plymouth City Council) received the TPA prize for best performance across the Master's course as a whole. Also at this event, we welcomed Adrian Davis as a newly-appointed Visiting Professor, in partnership with UWE's Bristol Social Marketing Centre. Adrian provided a keynote address concerning the linkages between transport and health.

CTS seminars were held throughout the year, featuring internal and external speakers. Professor John Urry of Lancaster University delivered a seminar in March titled 'Oil, mobilities and the American suburbs', whilst Dr Tim Schwanen visited in May from the University of Oxford to present on the topic 'Rethinking habits and their role in behaviour change: The case of low-carbon mobility'.

The highest-profile event of the year for CTS was a debate titled 'Sharing or separation: which way for streets of the

future', organised between Ben Hamilton-Baillie and Dr Steve Melia. The debate, chaired by Professor Graham Parkhurst, attracted more than a hundred delegates and generated media interest.

Also in May, CTS hosted a knowledge-exchange workshop on open data in association with our private enterprise partner ITOWorld.

In December the annual CTS Winter Conference featured a selection of the research papers that were to be presented at forthcoming conferences by CTS members, notably the 2013 Universities' Transport Study Group Conference in Oxford.

Looking to the future, CTS members are working towards making a core contribution to UWE's Research Excellence Framework (REF) submission in 2014.

In total, the annual report covers some 25 research studies and lists around 70 recent and forthcoming publications. The CTS website also provides two-page briefing sheets for many of its research activities.

### MEMBERSHIP NEWS

At the beginning of 2012, Dr Owen Waygood left UWE to take up an Assistant Professorship at Laval University, Canada and in July 2012 Christa Hubers returned to the Netherlands to undertake postdoc research at TUDelft. In October 2012, following eight years as a key member of CTS, Dr Erel Avineri returned to Israel to become a Professor at Afeka Tel Aviv Academic College of Engineering.

Following successful submission and defence of his thesis, former PhD student Dr Billy Clayton joined the staff team. Similarly, Dr Caroline Bartle was awarded

her PhD and undertook some months of postdoctoral work. Caroline and Dr Henrietta Sherwin, who also completed her research project during the year, retain their links with CTS and UWE as visiting researchers. Similarly, Dr Tilly Line moved elsewhere within UWE, but remains as a collaborating member. Former PhD student Dr Geoff Andrews left UWE after the completion of a productive postdoctoral year.

From September 2012, Daniela Paddeu of the University of Cagliari (Italy) began a six-month student placement, during which time she assisted with analysis and dissemination tasks in connection with the Civitas Renaissance project.

Three new research students began study for PhDs in 2012: Hannah Delaney, Geraldine Fulcher, and Ed Wigley.

Members of the Centre at the end of 2012 were:

#### Staff

Prof. Steve Atkins - Visiting Professor  
 Prof. Adrian Davis - Visiting Professor  
 Dr Caroline Bartle - Visiting Fellow  
 Dr Ben Clark - Research Associate  
 Dr Billy Clayton - Research Associate  
 Dr Eran Ben-Elia - Senior Research Fellow  
 Dr Kiron Chatterjee - Senior Lecturer in Transport Planning  
 Dr Geoff Dudley - Visiting Research Fellow  
 Prof. Phil Goodwin - Emeritus Professor  
 Dr Juliet Jain - Senior Research Fellow  
 Prof. Glenn Lyons - Professor of Transport and Society  
 Dr Steve Melia - Senior Lecturer in Transport and Planning  
 Dr Charles Musselwhite - Senior Lecturer in Traffic and Transport Psychology  
 Prof. Graham Parkhurst - Director and Professor of Sustainable Mobility  
 Dr Miriam Ricci - Research Fellow  
 Ian Shergold - Research Associate  
 Dr Henrietta Sherwin - Visiting Research Fellow

#### Research students

Helen Bowkett  
 Tom Calvert  
 Anja Dalton  
 Hannah Delaney  
 Geraldine Fulcher  
 Heather Jones  
 Rutul Joshi  
 Ed Wigley  
 David Williams

Abbreviations of organisations mentioned below:

ACIS Advanced Communication & Information Systems Ltd  
 ATS Advanced Transport Systems Ltd

AWP Avon & Wiltshire Partnership Mental Health Trust  
 B&NES Bath and Northeast Somerset Council  
 BCC Bristol City Council  
 BHCC Brighton & Hove City Council  
 BSG British Society of Gerontology  
 DfT Department for Transport  
 EC European Commission  
 EPSRC Engineering and Physical Sciences Research Council  
 ESRC Economic and Social Research Council  
 FHLS UWE Faculty of Health & Life Sciences  
 MRC Medical Research Council  
 NHS National Health Service  
 NCC Norfolk County Council  
 RCUK Research Councils UK  
 TRB United States' Transportation Research Board  
 TRL Transport Research Laboratory  
 TSB Technology Strategy Board  
 TSUG Transport Statistics Users Group  
 UITP International Association of Public Transport  
 UKTRC UK Transport Research Centre  
 UTSG Universities' Transport Study Group  
 WoE Four West of England Local Authorities

#### SENIOR STAFF ENGAGEMENTS

Dr Kiron Chatterjee was active in 2012 in developing and promoting the use of longitudinal research to understand travel behaviour. He gave a presentation on 'Longitudinal Research' at a seminar at DfT in February 2012 and secured an ESRC Secondary Data Analysis Initiative grant on 'Life Transitions and Travel Behaviour' with the University of Essex and DfT as research partners. Kiron was invited to present a paper on behavioural effects of joining a car club at the 92<sup>nd</sup> TRB Annual Meeting in January 2013 to be followed by a presentation of his research at a workshop on 'Dynamics in Travel Behavior' at the University of Maryland.

Professor Glenn Lyons remains an active member of CTS in parallel with his role as Associate Dean (Research and Knowledge Exchange) in UWE's Faculty of Environment and Technology. He continues his role on the editorial boards of two journals - Transport Reviews and Mobilities - and as a member of the TRB Telecommunications and Travel Behavior Committee. Glenn is a member of the EPSRC and ESRC Peer Review Colleges. During 2012 he acted as the RCUK Director of the first £1.5M full-scale 'Creativity Greenhouse' (virtual Sandpit) entitled "Achieving work-life balance in a digitally dependent world" under the

Digital Economy's Sustainable Society theme. He was also an International Evaluation Panel member for creation of a Swedish national centre for research and innovation for knowledge-based public transport. In Summer 2012 Glenn was one of ten academics and industrialists invited by the DfT Chief Scientific Adviser to engage in a 'technology foresight process' examining the potential impacts of technology on future transport. Invited presentations this year included a talk on Transport and Society at the African Renaissance Conference, Durban.

Dr Steve Melia continued to extend his research and teaching interests during the year. He completed the research project described below on alternatives to private car use by NHS staff and presented a paper arising from it on the at the 2013 UTSG Conference in Oxford. He began work on the Life Transitions project described below. He guest edited a special edition of the journal World Transport Policy & Practice 17 (4) on A Future Beyond the Car. Following publication of his article with Simon Moody about Shared Space, he took part in a well-publicised debate with Ben Hamilton-Baillie *Sharing or Separation: Which Way for the Cities of the Future?* Amongst his teaching responsibilities, he became programme manager for the MSc in Transport Planning during 2012.

Professor Graham Parkhurst presented a lecture on collective mobility to the TSUG, was a panel member for a UITP conference considering shared mobility and chaired a conference on the future of local transport. He provided presentations to the BSG annual conference (Keele University), at the University of Michigan to the conference 'Aging, Mobility and Quality of Life', and at the 'Civitas Forum' in Vitoria-Gasteiz. During the year he also contributed to the Department for Transport's Roads Reform Expert Group. In October Graham undertook an academic visit to CEPT University, Ahmedabad, India, where he provided a public lecture and took part in a symposium on transport planning in Indian cities.

#### ACKNOWLEDGEMENTS

We acknowledge with thanks the support of all the funding bodies named in the project descriptions below, and the cooperation of our partners.

## STRATEGIC THEMES

The following summaries identify projects in progress during 2012 grouped in seven strategic themes of application:

- car dependence;
- experience of the travel environment;
- mobility and the ageing population;
- promoting inclusive, low carbon, active travel;
- supporting and evaluating sustainable mobility strategies;
- technologies and travel;
- understanding and influencing attitudes and behaviours.

Three broad aims underlie these themes:

- improving our understanding of travel behaviour,
- promoting more equity in mobility, and
- developing innovative transport research methodologies.

## CAR DEPENDENCE

**Alternatives to Personal Car Use for Mobile NHS Professionals** (UWE SPUR, August 2011 to July 2012). *Steve Melia.*

This project explored the potential for more sustainable patterns of travel by mobile health professionals. It also explored the relationships between their travel for work and their modal choices in commuting and private travel. It uses as a case study AWP Mental Health Trust which introduced a pioneering scheme, involving the use of electric bikes and pool cars designed to reduce the use of employees' own vehicles for work travel. The study used an online survey completed by 306 staff, telephone interviews, a focus group, and analysis of carbon emissions. The findings suggest considerable potential for modal shift and carbon reductions in the travel of mobile health professionals in urban areas.

## THE TRAVEL ENVIRONMENT

**Bus Tales: Travel-time use, technologies, and journey experiences on the bus** (DfT/EPSC PhD Studentship, October 2008 to March 2012). *William Clayton.* Supervisors: *Graham Parkhurst, Juliet Jain and Tilly Line.*

This studentship is associated with the Ideas in Transit project and has now been completed. The focus of the research was firmly on the subjective experience of the bus environment; the part travel-

time activity plays in the creation of this experience; and how passengers' current positive experiences and perceptions of time in this unique environment might be 're-framed' to sustain, promote and expand patronage on public bus services. The variation in journey experience between different age groups on the bus was of particular interest; in specific relation to passengers' use of mobile technologies and ICTs, and the role that these play in creating and mediating subjective journey experience.

The thesis was submitted in the summer of 2012, with the viva taking place in late July. The research has generated a number of significant findings related to the relationship between travel-time activities and journey experiences on the bus. The public nature of the bus and the physical space of the vehicle are of particular importance in dictating what travel-time on the bus can be put to use for. Time on the bus is used for a variety of reasons: some passengers use this time to relax and enjoy a precious slice of free time, some passengers enjoy the opportunity to socialise, and yet others spend it blotting out the intensity of the social space and distracting themselves from the boredom they experience on the journey.

The findings demonstrate a number of important implications for service providers and policymakers concerned with improving the passenger experience and increasing the attractiveness of bus travel. These implications are being developed in greater depth in a piece of post-doctoral research which follows from the PhD.

**The urban pedestrian experience and pedestrian experience of motor traffic: A phenomenological investigation** (UWE PhD Studentship, October 2010 to October 2013). *Tom Calvert.* Supervisors: *Juliet Jain and Kiron Chatterjee.*

The research examines the pedestrian experience, focusing on its value and features as an experience. The first phase of data collection honed in one explicit area of pedestrian experience: that of being in the presence of motor traffic. Qualitative data on this topic was collected by 'walk-along' interviews where the researcher walked with each participant through a city centre and discussed the effect of traffic on them as a pedestrian.

The second phase of data collection looks at urban pedestrian experience more broadly, examining the subtleties of the psychological benefits that using the

mode can create. This phase of data is collected through recollections, in room interviews, of participants' regular walking trips. The research is structured and focused by maintaining phenomenological commitments, which will help in the research aim of learning to think more deeply and with greater subtlety about what the pedestrian mode offers trip makers.

**An Insight into Interactions on Shared-use Cycle and Pedestrian Paths** (UWE PHD Studentship, October 2012 to September 2015). *Hannah Delaney.* Supervisors: *Graham Parkhurst and Steve Melia.*

This project aims to examine the interactions between cyclists and pedestrians on shared use paths. The promotion of cycling and walking is prominent in local and national transport policy as a solution to problems such as obesity, traffic congestion and climate change. However, little attention has been given to the interactions between cyclists and pedestrians on shared use paths and the consequential issues associated with these interactions. This project aims to address this gap.

The research asks questions such as; how do cyclists and pedestrians share space? How do they perceive themselves and other modes? How do they impact on each other's journey? What implications does this have for current and future shared use path design guidelines and regulations? These questions will be addressed using a number of methods; survey questionnaires, video observation and video ethnography with in-depth interviews.

**Everyday Time-space Mobilities and the Incorporation of Religious Practice and Expression** (UWE PHD Studentship, October 2012 to September 2015). *Edward Wigley.* Supervisors: *Avril Maddrell, Juliet Jain and Veronica della Dora.*

Much of our time is spent on the move, from commuting to going out for shopping, recreational activities and more. The spaces we inhabit when moving are often considered to be secular and rationalised spaces for the single purpose of transiting from one place to the other. But for many people, everyday life and movement has to incorporate their religious and spiritual beliefs and practices. My project opens up the time-space of travel and mobility for analysis of how religious beliefs and practices are produced and reproduced

on the move as components of travel time usage, and the enabling or constraining the individual from engaging with religion and spirituality.

### MOBILITY AND THE AGEING POPULATION

#### Grey and Pleasant Land?: an Interdisciplinary Exploration of the Connectivity of Older People in Rural Civic Society

(UK Research Councils' New Dynamics of Ageing programme, January 2009 to April 2012). *CTS grantholder and lead: Graham Parkhurst with Charles Musselwhite, Ian Shergold. Workpackage Co-investigators: Kate Galvin, Les Todres (University of Bournemouth), Judith Philips University of Swansea). Project Principal Investigator: Catherine Hennessy (University of Plymouth).*

The project, which examined older people's 'connectedness' in rural areas, drew to a close in early 2012. CTS led the third work package which concerned the ways that mobility supports connectivity. Hence the work package considered the various ways that mobility facilitates or constrains connectivity and quality of life amongst the rural elderly, and the implications for their mobility choices for the future sustainability of their communities.

2012 saw intensive dissemination of the findings, with presentations on the theme of one of the key theoretical contribution, a continuum of mobilities for understanding mobility across the lifecourse, being made at presentations at 'Aging Mobility and Quality of Life' (Ann Arbor, June 2012) and the British Society of Gerontology (Keele, July 2012). A paper on the same theme was accepted as a plenary address to the January 2013 Universities' Transport Study Group conference. Journal articles from the work package team appeared during the year in *Transport Planning and Technology*, *Phenomenology and Practice*, and the *Journal of Rural Studies* (2012). A draft chapter for a book based on the project was submitted for review in December.

The end of project report is available on the ESRC website: <http://www.esrc.ac.uk/>.

#### Just the Ticket? Report on the Benefits of England's Concessionary Travel Scheme.

(Age UK). Geoff Andrews, October 2011-June 2012)

Following completion of his PhD, Geoff Andrews was commissioned by AgeUK to

prepare a report summarising his findings for practitioners and the wider public. The report argued that the concessionary fares policy provides quality of life benefits above and beyond simply the opportunity to increase trip frequency, and that these wider benefits are currently poorly taken into account by those evaluating the policy. For instance, the potential to travel, even when travel is not actually undertaken is a significant contributor to many older people's quality of life. The report provided robust evidence on the social benefits of the policy, for instance its role in encouraging the self-prevention of isolation in later life, facilitating older people's participation in society and allowing pass holders to justify trips that they would otherwise not make even in cases where they could afford them, but which disproportionately influence their quality of life. The report concludes that these benefits play a significant role in maintaining quality of life in older age.

The report is available to download from the Age UK website:

<http://www.ageuk.org.uk/>

#### Research into the social and health value of Community Transport in Norfolk

(NCC, October 2011 to Jan 2013). *CTS Project Manager Ian Shergold; with Charles Musselwhite, Graham Parkhurst, Richard Kimberlee (UWE FHLS)*

This project aimed to better understand the health and wellbeing benefits of CT through a simple 'return on investment' (ROI) exercise, using tools and methods from the social investment appraisal discipline. Research involved a range of community schemes, as well as residents in an area not currently served by CT. The team attempted to develop an appraisal mechanism that was robust, and credible albeit less extensive than the full 'Social Return on Investment' method. The methods used were designed to allow the exercise to be repeatable and transferable.

In September 2012, the project reported on the relative success of the approach, and the 'positive' benefits identifiable in the ROI (in particular for the rural car schemes). Results were also disseminated through papers at the British Society of Gerontologists and UK Transport Practitioners annual conferences.

The opportunity arose in the autumn of 2012 to extend the study into another

more urban CT scheme in Norfolk. Results from this comparison are expected in early 2013

### PROMOTING INCLUSIVE, LOW CARBON, ACTIVE TRAVEL

#### Applying the Life Course Approach to Walking and Cycling

(ESRC/MRC studentship, October 2009 to June 2013). *Heather Jones. Supervisors: Kiron Chatterjee and Selena Gray (FHLS).*

Supporting people to be physically active by walking and cycling throughout life can deliver health improvement and reduce the environmental impact of transport. Underpinned by the life course perspective, this project sought to understand individual life course patterns walking and cycling and how these pathways are shaped by linked lives and the broader historical context. Thirty-three interpretive biographies of walking and cycling were produced with individuals from two birth cohorts. These set current behaviour within the context of cumulative life experiences. Gender differences were prominent and underpinned by differences in family, employment and car ownership trajectories. Differences between the cohorts suggest macro-level social and structural changes could be having an influence on walking and cycling trajectories through shifts in the timing and nature of life course transitions.

#### Exploring Poverty-transport Linkages: Mobility Practices of the Urban Poor in Ahmedabad (India).

(UWE PhD studentship, February 2010 to September 2013). *Rutul Joshi.*

*Supervisors: Graham Parkhurst, Charles Musselwhite and Yusak Susilo.*

The research aims to explore through a specific city case-study how the poor in developing countries negotiate their mobility practices and travel choices.

One of the crucial aspects of urban poverty in India and elsewhere in the developing world is the role that the transport system plays in preventing or enabling the poor to access resources for their everyday life. Transport-based mobility can be seen as negotiating practices and weighing consequences within the marginalized socio-economic context and informal housing and job markets. The idea of 'mobility practices' rooted in the concept of 'social practices' expands the limits of conventional travel behaviour research. Such departures are helpful in examining

multifaceted notions of poverty and in viewing poor people own efforts of coming out of poverty, some of which are related to transport. The city of Ahmedabad in India is selected as a case study, which has some typical characteristics of urbanization in India such as rapid urbanization, depleting infrastructure, the processes of slumming (and governmental aspirations for de-slumming) indicating contests for space and resources. This is coupled with a high growth rate of private motor vehicle use and the building of big transport infrastructure projects to 'ease congestion'.

The study combines quantitative and qualitative methods; first to specify what are the mobility practices and secondly exploring why these practices occur in the given context. As part of the study, about 580 households were surveyed in 15 settlements distributed in different geographical locations of the city. The travel characteristics captured as part of the surveys were frequency of trips for various purposes, mode use, destination, routes and cost and time taken, which are being analyzed by gender, income, employment and the location characteristics of the various settlements. Furthermore, about 34 individual qualitative interviews were conducted in the settlements including interviewees with varying employment and housing scenarios. The qualitative interviews helps to get nuanced views on crucial aspects of mobility practices and travel choices avoiding any simplistic conclusions based only on the quantitative data. This PhD is in the writing up phase proceeding towards the draft preparation.

**Exploring the Usability of Cycle Maps** (BCC, December 2011 to March 2012). *Henrietta Sherwin and Caroline Bartle. Partner: CycleCity Guides.*

Local authorities produce a wide range of local maps every year, intended to facilitate cycling, walking and the use of public transport. However, the design and style of such maps varies substantially across the UK (unlike road maps designed for driving, which follow a more standard format). There has been no comprehensive evaluation of the 'usability' of different styles of map from a user's perspective. Consequently, there is a risk that public resources may be

being wasted on the production of maps which do not serve their intended purposes as well as they might.

CTS was commissioned by BCC to undertake this study of the usability of different styles of map from the perspective of different types of map-user, particularly those who are contemplating cycling to work. The research involved focus groups comprising mainly non-cyclists and occasional cyclists, to obtain their views on four styles of map, each covering the same area of North Bristol. The maps were produced especially for the research by CycleCity Guides and BCC.

### SUPPORTING AND EVALUATING SUSTAINABLE MOBILITY STRATEGIES

**Evaluation of the Cycling City and Towns Programme** (DfT, February 2009 to July 2014). *Kiron Chatterjee, Graham Parkhurst, Henrietta Sherwin and Juliet Jain. Partners: AECOM (lead) and Tavistock Institute.*

Between 2008 and 2011, the DfT, Cycling England and the Department of Health invested over £43m (plus local match funding) to create twelve Cycling City and Towns (CCTs): Greater Bristol, Blackpool, Cambridge, Chester, Colchester, Leighton-Linslade, Shrewsbury, Stoke-on-Trent, Southend, Southport, Woking and York. The aim of the programme was to explore whether and how increased investment in cycling, as part of a whole-town strategy, could lead to a significant and sustained increase in the number of cyclists and frequency of cycling. UWE is contributing to the evaluation of the programme. A main objective is to obtain robust evidence about programme impacts in terms of cycling and other travel behaviour, physical activity and wider impacts such as carbon emissions.

The evaluation strategy involved a two-wave household panel survey, qualitative work with a subset of the households to understand behavioural change, and process evaluation. Following the baseline survey conducted in 2009, the follow-up household survey undertaken in 2012, one year after the CCT programme funding period ended.

Dissemination of the qualitative research continued in 2012, notably at the TRB conference in Washington, D.C. and Cycling and Society Symposium in London. The findings had demonstrated how life events were usually the trigger for a change in cycling but external changes to the bicycle environment

played a facilitating role in enabling change. The types of life events that were relevant varied over the age span of participants. Practitioners can take advantage of the life events identified as opportunities to promote cycling.

**RENAISSANCE: Testing Innovative Strategies for Clean Urban Transport** (EC Civitas Plus, September 2008 to January 2013). *Graham Parkhurst (CTS lead), Miriam Ricci, Ian Shergold, Kiron Chatterjee, Erel Avineri, Yusak Susilo, Charles Musselwhite, Neil Larsen. Bath Partners: B&NES (Bath site lead), First Group plc, ATS Ltd, City Car Club, Comunicare srl, ACIS Ltd.*

CTS was one of eight partners involved in designing, implementing and evaluating a €7 million package of policies for more sustainable mobility in Bath, with €4 million provided in support by the EC's Civitas Plus initiative. The Bath measures consisted of: (i) two feasibility studies into Personal Rapid Transit and Galileo applications for innovative telematic systems; (ii) four trials that used new technologies for new or existing transport options - a diesel electric hybrid bus trialled on the Park & Ride (P&R) service, hybrid cars (Toyota Prius) included in the fleet of the Bath City Car Club, pedal bike share and an electric delivery vehicle used to serve the Bristol and Bath Freight Consolidation Centre; (iii) two pedestrian movement and environmental improvement demonstrations in selected areas of Bath city centre; and (iv) a novel Heavy Goods Vehicle (HGV) restraint demonstration, involving a vehicle-activated sign coupled with number plate recognition cameras.

In general terms the measures showed results in line with policy intentions, with the public, overall, favouring the environmental changes over the status quo and carbon emissions being saved by use of the hybrid bus and the consolidation of deliveries. Vehicle counts suggested illegal HGV movements were reduced. However, this measure, along with hybrid bus deployment and freight consolidation scheme face financial viability barriers. A more permanent, expanded cycle sharing scheme was under discussion for Bath at the time of writing.

2012 saw the CTS evaluation team working intensively to produce the evaluation deliverables for the European Commission, preparing dissemination outputs and presenting the results at conferences including the Civitas Forum and the International Conference of

Travel Behaviour Research. Further papers were accepted for presentation at a UWE conference on cycling in July 2013 and at the Royal Geographical Society in August 2013.

#### **Bringing smarter choices into multi-modal models**

(UWE PhD Studentship, October 2009 to December 2013). *Helen Bowkett*.  
*Supervisors: Kiron Chatterjee and Graham Parkhurst.*

This study is exploring methods to incorporate the modelling of smarter choices into a consistent and integrated approach to the modelling of transport demand by all modes. There is a growing awareness that transport problems often need to be tackled by a multi-modal response. The emphasis now in transport appraisal is to analyse the problems facing an area and to set out a selection of possible solutions, drawing on potential contributions from all modes and smarter choices measures.

A proto-type agent based model of the journey to work was built and presented at UTSG 2012. The current stage of the research is to empirically ground the model in observed data. The model is based on the DfT Climate Change and Transport Choices dataset which incorporated a stated preference survey with commuters, offering a choice between car, train, bus and cycling.

#### **West of England Local Sustainable Transport Fund: Evaluation**

(WoE Partnership, October 2011 to March 2015). *Kiron Chatterjee, Miriam Ricci, Ian Shergold and Billy Clayton.*

The four West of England local authorities were successful in gaining funding from the DfT's Local Sustainable Transport Fund (LSTF) to deliver the Key Commuter Routes (KCR) project in 2011/12-2012/13 and the WEST large project 2012/13-2014/15. CTS is working in partnership with the local authorities as evaluators. This involves establishing an evaluation framework and plan, reviewing existing and new data collection requirements, assisting with overseeing of data collection, assisting with analysing information and assisting with reporting and dissemination.

#### **Understanding perceptions of the Transport Planning Professional qualification**

(CIHT September 2012 - November 2012)  
*Glenn Lyons and Ben Clark*

CTS were commissioned to undertake an analysis of a survey of transport planning

professionals which sought to explore how wider uptake of the Transport Planning Professional qualification could be encouraged. The final report made four recommendations: 1. Encourage senior professionals to advocate the qualification to junior staff; 2. Ensure the personal benefits of the qualification are clearly publicised and evidenced; 3. Investigate whether the competency requirements can be made more flexible; and 4. Review the efficacy of the guidance notes and mechanisms through which advice can be sought.

The final report can be downloaded from <http://www.ciht.org.uk>.

### **TECHNOLOGIES AND TRAVEL**

#### **The Impact of Non-Transport Technologies on Travel Demand**

(UKTRC, October 2009 to October 2012). *Christa Hubers, Ian Shergold.* UWE  
*Grantholder: Glenn Lyons. Lead Partner: Centre for Mobilities Research, Lancaster University.*

This research project has examined how 'non-transport technologies' indirectly shape the nature and extent of travel demand through their influence upon evolving social practices. Consideration of the role of technologies is not new within transport planning and policy. However, attention has normally focused on transport technologies which enable the more effective operation and use of the transport system, or on substitution technologies which facilitate alternatives to travel such as teleworking or e-shopping. Yet a much greater array of technologies are significant for existing and future travel demand. This project has used a mixed-method approach to research various 'non-transport' technologies and their role and potential in altering social practices and hence patterns of transport and travel.

In particular, CTS considered new assistive technologies in the home and possible ways in which they will change the social practices of older people and especially the 'care miles' that they and their carers may come to travel.

The research has underlined the significant potential implications of non-transport technologies for future economic and social practices and hence for future travel demand. It has also highlighted how challenging it can be for policymakers to account for such developments.

#### **Ideas in Transit**

(EPSRC/DfT/TSB, October 2007 to September 2012). *Juliet Jain, Tilly Line, Charles Musselwhite, Billy Clayton, Steve Melia, Henrietta Sherwin, Erel Avineri, Caroline Bartle, Ben Clark.* *Grantholder: Glenn Lyons. Partners: Ito World Limited; Ergonomics and Safety Research Institute, Loughborough University; and Ordnance Survey.*

Intelligent Transport Systems has been a field focused upon how information and communications technologies can be used to provide systems and services that can support the operation and management of our transport systems and their use by travellers. For many years this has been a 'top-down' industry in terms of new innovations and developments regarding information services for travellers.

However, the world around this industry has been changing rapidly. Web 2.0 and mobile technologies such as smart phones have spawned an array of social media developments with capacity for individuals to communicate with each other and to co-create and share data, information and knowledge. Allied to this, governments have come to recognise that opening up the data sets they hold can release value from them as third parties use that data as a source for innovation - in an era in which the 'app' phenomenon has emerged.

This five year project sought to explore the concept of bottom-up 'user innovation' in transport - the possibilities for users themselves to harness the information age capabilities above to address challenges or problems they identified in people's transport needs being met.

The project has examined the context for user innovation through the study of people's everyday mobile lives and the extent to which they sense they face problems or challenges and what appetite in turn they may have for creative behaviours and user innovation. It has gone on to identify a considerable number of specific examples of user innovations (over 200 in total). The project team then examined a sample of such innovations and worked with the innovators concerned to better understand the motivations, enablers and barriers for the innovations arising and being pursued. The project has also sought to trace and understand the changing landscape of social media and data sources generated by users such as OpenStreetMap and Wikipedia. It has looked to better understand the nature

and extent to which user needs within user innovation developed are or could better be addressed - for example through user-centred design. It has, in addition, explored the potential for co-design techniques to increase the generation of innovative ideas.

Overall as a result of tracing and understanding this rapidly evolving dimension of transport and technology, the project has sought to interpret what this might mean for the future of Intelligent Transport Systems and how 'top-down' and 'bottom-up' relate to one another. User innovations are not universally successful and many are at early stages of development struggling for resource; many appear to have few users - reflective in part of their niche offering and a busy 'information marketplace' but also of their lack of resonance with a substantive and unmet user need. At the same time, some are proving significant in offering attractive services to users and show growing use. For the coming years, the question is whether user innovations will complement ITS provision or begin to substitute for this. The Key Findings Report from the project can be downloaded from <http://eprints.uwe.ac.uk/19928/>.

**Re-imagining the bus: Road Public Transport Services in a World of Falling Subsidies and More Complex Demand** (UWE SPUR, from Sept 2011 to August 2012). *Ian Shergold, academic mentor: Graham Parkhurst. External partners: Passenger Focus, Forum for the Future*

This study looked to better understand what was happening to 'the bus' at a time when significant reductions in public transport capacity were forecast, yet there appeared to be a growing demand as a result of an ageing population and the increased costs of using a private car.

The project carried out initial literature review work, and the findings from this were presented at the 2011 CTS Winter Conference. Opportunities then arose to engage in several related topics, leading on to three other pieces of work. These considered new ticketing technologies (see below), flexible transport services to specific employment locations (short-term consultancy work), and the role of community transport (see above). The project also provided inputs to preliminary work with UWE colleagues and international partners on a potential EU funding bid around access across a range of 'shared' transport options.

**Feasibility Study for a South West based Testing Service for NFC by Real People in the Real World.** (iNet, from Sept 2011 to September 2012). Project Manager *Ian Shergold, with Billy Clayton. External partners: Fenbrook Consulting, Near Field solutions, White Willow Consulting, Stagecoach.*

This work, funded through the EU iNet programme looked to better understand how the public might use mobile phones equipped with NFC technology as public transport tickets - in the real world as opposed to lab simulations of the technology itself. With the external partners, a new and novel evaluation model was developed, based on earlier work in ticketing innovation, and exploring the notion of 'misfits' in people's use of the technology. Further funding was obtained in the summer of 2012 to pilot the evaluation method as part of a trial being undertaken by the public transport operator Stagecoach. The model captured and quantified a range of issues experienced by the public, and offered an effective framework within which to capture and explore real-life experience. The model, and the results have since been presented to the partners and to Passenger Focus - the body representing public transport users in England. Commercial opportunities for the tool are still being sought by partners.

#### **ChoiceRail**

(TSB, October 2012 to March 2013). Ian Shergold. UWE Grantholder: Glenn Lyons. Partners: Trapeze; Cotares; and Inrix Media

Current journey planners tend either to address individual modes (e.g. car, train, walk, cycle) or public transport options that may include access/egress modes as well as the main mode of travel. The aim of this project is to develop an intermodal journey planning tool for rail and road. This goes beyond simply treating the car as the access mode for reaching the local train station of departure. It also aims to accommodate real-time conditions in identifying viable road+rail travel options. The intention is to provide users with full door-to-door journey routing, including rail and road combinations for multiple access points. CTS is responsible for examining user reactions to and requirements from this proposition.

## **UNDERSTANDING AND INFLUENCING ATTITUDES AND BEHAVIOURS**

### **Life Transitions and Travel Behaviour** (Kiron, Steve, Ben).

It is known that significant changes in travel behaviour are often associated with life transitions. Life transitions involve a change in personal circumstances, typically marked by observable life events such as joining the labour force, moving home, having children or retiring. This research project is exploring the extent to which different life events are associated with changes in travel behaviour. It is also examining the circumstances under which life events are most likely to result in changes in travel behaviour.

The project is using data from the Understanding Society survey and the British Household Panel Survey (BHPS). Together, these surveys have tracked the lives of a nationally (UK) representative sample of individuals over multiple years. They have recorded information concerning household car ownership and commuting behaviour, as well as a variety of other information about people's lives such as their relationships, employment, attitudes and health. Accordingly, the survey data offers a unique opportunity to examine how individuals make changes to their travel behaviours over time in relation to life events. For further information see: [www.travelbehaviour.com](http://www.travelbehaviour.com)

**A Study of the Role of Disruption in the UK Transport and Travel Planning: A Social Practice Perspective** (PhD Study, October 2011 to October 2014). David Williams. Supervisors: Tim Chatterton, Graham Parkhurst.

In the UK, the majority of everyday journeys are made by private vehicle, which is inefficient and damaging to the environment. When these journeys are disrupted, what lessons can we learn from these disruptions to change to more sustainable travel behaviour? Traditional methods of changing travel behaviour focus on the individual. This research uses a social practice approach looks at changing wider society to enable people to change their existing travel habits, with a focus on the local authority sector. The research forms part of the wider ESPRC/RCUK Energy Programme Disruption project, focused on understanding how people change their behaviour when a disruption alters their normal travel practices.

The study is in the second year and has initially assessed the Local Sustainable Transport Fund (LSTF) bids to the Department for Transport in 2011 and 2012. The LSTF is the exemplar for behavioural change delivery in England, so the bid documents have been assessed to see if they 'disruptive' measures have been implemented through this process. The research will also include a survey of local transport practitioners and a set of more in-depth follow up interviews.

David won the FET Doctoral Exchanges Poster Competition in 2012 for his poster: 'A Social Practice Perspective on Travel'.

### Exploring the Applicability of Non-self-Report (Implicit) Methods in Predicting Transport-related Behaviour

(PhD Study, October 2012 to September 2015). *Geraldine Fulcher. Supervisors: Graham Parkhurst, Chris Alford, Charles Musselwhite.*

Arguably, the two most important issues in transport are safety and sustainability. These are traditionally researched using self-report (explicit) measures. Many of these have numerous shortcomings - respondents can fake answers, they can misinterpret the questions, and they may even find it difficult to answer questions about their own attitudes and behaviour.

Implicit methods seem to capture attitudes that are sensitive in nature and hence difficult to elicit (e.g. racial prejudice) and attitudes that have low social acceptance (e.g. alcoholism and smoking). Risky driving, particularly speeding, is a crime and is therefore a sensitive issue and can be very difficult to capture using an explicit questionnaire (individuals may be reluctant to admit breaking the law). Given the demonstrated usefulness of implicit methods in other domains, this project will seek to investigate the suitability of implicit methods in measuring transport related attitudes and behaviour by comparing the results of the explicit with the implicit measures to see if either or both are able to help predict and understand behaviour. It will also seek to identify and map out an implicit method that is easy to implement and inexpensive for predicting attitudes towards speeding and different mode of transport choices.

### RECENT PUBLICATIONS

Papers and publications for 2012 onwards are listed below.

Abbas, M., Avineri, E., Fries, R., Ishak,

S., Jha, M., Kikuchi, S., Liu, F., Praveen, E., Qi, Y., Sanford-Bernhardt, K., Saunier, N., Spring, G., Venkatanarayama, R., Williams, B. and Zhang, Y. (2012) Thoughts on the future of AI and transportation. *Transportation Research Circular E-C168*. Transportation Research Board, Washington.

Alexander, B., Ben-Elia, E. and Ettema, D. (2013) Activity fragmentation, ICT, and travel: Unraveling interrelationships with structural equation models. In: *Transportation Research Board 92nd Annual Meeting*, Washington, D.C., USA, 13-17 January, 2013.

Andrews, G. (2012) *Just the ticket? Exploring the contribution of free bus fares policy to quality of later life*. PhD, University of the West of England, Bristol.

Andrews, G. (2012) *Just the ticket? Understanding the wide-ranging benefits of England's concessionary fares policy*. Project Report. Age UK.

Andrews, G., Parkhurst, G., Susilo, Y. and Shaw, J. (2012) The grey escape: Investigating older people's use of the free bus pass. *Transportation Planning and Technology*, 35 (1). pp. 3-15.

Avineri, E. (2012) AI and travel demand modelling: Travel behaviour research. *Transportation Research Circular E-C168*. Transportation Research Board, Washington, pp77-85.

Avineri, E. (2012) Nudge versus shove: Behavioural economics from the perspective of transport and climate change: Travel demand modelling and design of behaviour change measures. In: *Modelling World Conference*, London, UK, 11-12 July, 2012. London.

Avineri, E. (2012) On the use and potential of behavioural economics from the perspective of transport and climate change. *Journal of Transport Geography*, 24. pp. 512-521.

Avineri, E., Shinar, D. and Susilo, Y. (2012) Pedestrians' behaviour in cross walks: The effects of fear of falling and age. *Accident Analysis & Prevention*, 44 (1). pp. 30-34.

Avineri, E. and Waygood, O. (2013) Applying valence framing to enhance the effect of information on transport-related carbon dioxide emissions. *Transportation Research Part A: Policy and Practice*, 48, pp. 31-38.

Avineri, E. and Waygood, O. (2012) Gain/loss framing of transport-related CO2 amounts. In: *Technion-Erasmus Workshop on Prospect Theory and*

*Experience*, The Dead Sea, Israel, 9-11 January, 2012. The Dead Sea, Israel.

Avineri, E. and Waygood, O. (2012) The use of framing to highlight differences between transport-related CO2 amounts. *PROJECT, Journal of the Department of Planning and Architecture*, 4, pp. 93-95.

Bartle, C. (2012). Spreading the Word: A Social-Psychological Exploration of Word-of-Mouth Traveller Information in the Digital Age. In: *44th Annual Universities' Transport Study Group Conference*, Aberdeen, January 2012.

Bartle, C. and Avineri, E. (2012). *User participation in the design of innovative information services to influence travel behaviour: the 'myPTP' case study*. Project Report, University of the West of England.

Bartle, C., Avineri, E. and Chatterjee, K. (2013). Online information-sharing: a qualitative analysis of community, trust and social influence amongst commuter cyclists in the UK. *Transportation Research Part F: Traffic Psychology and Behaviour*, 16, pp. 60-72.

Bartle, C. and Avineri, E. (2013). Personalised Travel Planning in the Workplace: the importance of social context. In: *45th Universities' Transport Studies Group Conference*, University of Oxford, 2-4 January 2013.

Bellaby, P., Flynn, R. and Ricci, M. (2012) Rapidly diffusing innovation: Whether the history of the Internet points the way for hydrogen energy. *Innovation: The European Journal of Social Science Research*. 25 (3), 322-336.

Ben-Elia, E., Ishaq, R. and Shiftan, Y. (2013) If only I had taken the other road: Regret, risk and reinforced learning in informed route-choice. *Transportation*. 40 (2), 269-293.

Ben-Elia, E. and Shiftan, Y. (2013) "Understanding behavioural change: An international perspective on sustainable travel behaviours and their motivations" Selected papers from the 12th world conference on transport research. *Transport Policy*, 26, pp. 1-3.

Chatterjee, K., Andrews, G., Ricci, M., Parkhurst, G. (2012). Understanding Why Joining a Car Club can Increase or Decrease Car Use. 13th International Conference on Travel Behaviour Research, Toronto 15-20, July 2012.

- Chatterjee, K. and Dudley, G. (2012) Time series information and pivotal events. In: Tarrant, D., (ed.) *A New Look at Transport: With the Advantage of Hindsight*. Ashgate.
- Clark, B. (2013). The public relies on Wikipedia, so it's our job to ensure its transport entries are accurate. *Local Transport Today*, 616, p. 14.
- Clark, B., Lyons, G. and Miller, P. (2013) Should Wikipedia be embraced by the transport profession as an influential source of information on transport issues? In: *45th Universities' Transport Studies Group Conference*, University of Oxford, 2-4 January 2013.
- Clark, B. and Lyons, G. (2012) *Understanding perceptions of the transport planning professional qualification*. Project Report. University of the West of England.
- Clark, B. (2012) *Understanding how household car ownership changes over time*. PhD, University of the West of England.
- Clark, B., Lyons, G. and Chatterjee, K. (2012) Exploring the interactions between life events, neighbourhood choice and car ownership transitions: Insights from a retrospective longitudinal survey. In: *44th Universities' Transport Studies Group Conference*, Aberdeen, UK, January 2012.
- Clayton, W. (2012) Is the bus boring? In: *Universities Transport Studies Group Conference*, University of Aberdeen, UK, 3-6 January.
- Clayton, W. and Musselwhite, C. (2012) *Cycling and behaviour change: Using games to improve the experience for families*. Project Report. University of the West of England, Bristol.
- Cook, C., Curry, A., Hubers, C. and Lyons, G. (2012) *Care miles - Scenarios workshop report: Examination of future scenarios for the ESRC project 'Technologies and Travel'*. Project Report. University of the West of England, Bristol.
- Farag, S. and Lyons, G. (2012) To use or not to use? An empirical study of pre-trip public transport information for business and leisure trips and comparison with car travel. *Transport Policy*, 20. pp. 82-92.
- Flynn, R., Ricci, M. and Bellaby, P. (2012) Ambiguity, complexity and uncertainty surrounding the hazards of hydrogen: Aspects of trust in risk regulation. *Journal of Risk Research*, 15 (4). pp. 373-387.
- Flynn, R., Ricci, M. and Bellaby, P. (2013) Deliberation over new hydrogen energy technologies: Evidence from two Citizens' Panels in the UK. *Journal of Risk Research*. 16 (3-4), 379-391.
- Hubers, C. and Lyons, G. (2013). Assessing future travel demand - a need to account for non-transport technologies? Forthcoming in *Foresight*.
- Jain, J. and Glenn Lyons, (2012) (Eds.) *Travelling in a changing world: Key findings report from the project 'Ideas in Transit'*. Project Report. University of the West of England, Bristol.
- Lamont, D, Kenyon, S. and Lyons, G. (2013) Dyslexia and mobility-related social exclusion: the role of travel information. *Journal of Transport Geography*, 26. pp. 147-157.
- Line, T., Chatterjee, K. And Lyons, G. (2012). Applying behavioural theories to studying the influence of climate change on young people's future travel intentions. *Transportation Research Part D*, 17 (2012), 270-276.
- Lu, X., Gao, S., Ben-Elia, E. and Pothering, R. (2012) Information impacts on travelers' route choice behavior in a congested risky network. In: *Transportation Research Board 91st Annual Meeting*, Washington, D.C., USA, January 22nd - 26th, 2012.
- Lyons, G. (2012) Transport and society: 10 insights for the Renaissance. In: *African Renaissance Conference*, Durban, South Africa, 24th - 25th May, 2012.
- Lyons, G. (2012) Visions for the future and the need for a transport in society perspective. In: Geels, F., Kemp, R., Dudley, G. and Lyons, G., (eds.) *Automobility in transition? A socio-technical analysis of sustainable transport*. New York: Routledge, pp. 29-48.
- Lyons, G. (2013) Business travel: The social practices surrounding meetings. *Research in Transportation Business & Management* (in press).
- Lyons, G. (2013). Times. In Adey, P., Bissell, D., Hannam, K., Merriman, P. and Sheller, M. (Eds) *Handbook of Mobilities*, Forthcoming, Routledge.
- Lyons, G., Jain, J., Mitchell, V. and May, A. (2012) The emergent role of user innovation in reshaping traveler information services. In: Geels, F., Kemp, R., Dudley, G. and Lyons, G., eds. (2012) *Automobility in transition? A socio-technical analysis of sustainable transport*. New York: Routledge, pp. 268-285.
- Lyons, G., Jain, J., Susilo, Y. and Atkins, S. (2013) Comparing rail passengers' travel time use in Great Britain between 2004 and 2010. *Mobilities* (in press).
- Lyons, G., Jain, J., Susilo, Y. and Atkins, S. (2012) Comparing rail passengers' travel time use in Great Britain between 2004 and 2010. In: *Proceedings 44th Universities Transport Study Group Conference*, Aberdeen, UK, January, 2012.
- Melia, S. (2012) A future beyond the car? Editorial introduction. *World Transport Policy and Practice*, 17 (4). pp. 3-6.
- Melia, S. (2012) Filtered and unfiltered permeability: The European and Anglo-Saxon approaches. *PROJECT, Journal of the Department of Planning and Architecture*, 4. pp. 6-9.
- Melia, S., Barton, H. and Parkhurst, G. (2013) Potential for carfree development in the UK. *Urban Design and Planning*, 166 (2). pp. 136-145.
- Moody, S. and Melia, S. (forthcoming) Shared space: Implications of recent research for transport policy. To be published in *Proceedings of the Institution of Civil Engineers - Transport*.
- Melia, S. (2013) *Alternatives to private car use by mobile NHS professionals*. In: *Proceedings of the 45th Universities Transport Study Group Conference*, Oxford, 2-4 January.
- Musselwhite, C. (2012) Book review on *Mobilities: New perspectives on transport and society* by Margaret Grieco and John Urry (eds) (2011). Ashgate: Farnham. *Journal of Transport Geography*, 25. p. 162.
- Musselwhite, C. and Shergold, I. (2012) Examining the process of driving cessation in later life. *European Journal of Ageing*, 10 (2). pp. 89-100.
- Olowoporoku, A., Hayes, E. T., Longhurst, J. and Parkhurst, G. (2012) The rhetoric and realities of integrating air quality into local transport planning process. *Journal of Environmental Management*, 101 (30). pp. 23-32.
- Parkhurst, G., Kemp, R., Dijk, M. and

- Sherwin, H. (2012) Intermodal personal mobility: A niche caught between two regimes. In: Geels, F., Kemp, R., Dudley, G. and Lyons, G. (eds.) *Automobility in Transition?* Routledge.
- Parkhurst, G., Galvin, K., Musselwhite, C., Phillips, J., Shergold, I., Todres L. (2013) A Continuum for Understanding the Mobility of Older People In: *Proceedings of the 45th Universities Transport Study Group Conference*, Oxford, 2-4 January.
- Shergold, I., Lyons, G. and Hubers, C. (2013) Future mobility in an ageing society: Where are we heading? In: *Proceedings of the 45th Universities Transport Study Group Conference*, Oxford, 2-4 January.
- Shergold, I., Parkhurst, G. and Musselwhite, C. (2012) Rural car dependence: An emerging barrier to community activity for older people. *Transportation Planning and Technology*, 35 (1). pp. 69-85.
- Shergold, I. and Parkhurst, G. (2012) Transport-related social exclusion amongst older people in rural Southwest England and Wales. To be published in *Journal of Rural Studies: Special Issue on Growing Old in Rural Places*, 28 (4). pp. 412-421.
- Sherwin, H., Chatterjee, K. and Jain, J. (2012) An exploration of the importance of social influence in the decisions to start bicycling in England. Travel behaviour research: Current foundations, future prospects. In: *13th International Conference on Travel Behaviour Research*, Toronto, Canada, 16-20 July, 2012.
- Sherwin, H. and Bartle, C. (2012) *Evaluating cycle mapping styles*. Project Report. University of the West of England, Bristol.
- Sherwin, H. and Melia, S. (2012) *Cycle Mapping in the UK and the 'London Cycle Map'*. Project Report. University of the West of England, Bristol.
- Susilo, Y. and Avineri, E. (2012) The impacts of household structure on the individual stochastic travel and out of-home activity time budgets. In: *91st Annual Meeting of the Transportation Research Board*, Washington, D.C., USA, January 2012. Washington, D.C.: Transportation Research Board
- Susilo, Y., Lyons, G., Jain, J. and Atkins, S. (2012). Rail Passengers' Time Use and Utility Assessment: 2010 findings from Great Britain with multivariate analysis. *Transportation Research Record: Journal of the Transportation Research Board*, 2323 (2), Transportation Research Board of the National Academies, Washington, D.C., 99-109.
- Tillema, T., Ben-Elia, E., Ettema, D. and van Delden, J. (2013) Charging versus rewarding: A comparison of road-pricing and rewarding peak avoidance in the Netherlands. *Transport Policy*, 26. pp. 4-14.
- Waygood, E. and Avineri, E. (2012) Transportation carbon emission information: the effect of format on behavioural intention. In: *13th International Conference on Travel Behaviour Research*, Toronto, Canada, 16-20 July, 2012.
- Waygood, O., Avineri, E. and Lyons, G. (2012) The impact of travel information systems. Chapter 12 in: Ryley, T. and Chapman, L., (eds.) *Transport and Climate Change*. Emerald, pp. 313-340.
- Waygood, O., Chatterton, T. and Avineri, E. (2012) Leaders and laggards in transport CO<sub>2</sub> emissions: The challenges and outcomes of benchmarking sustainable urban transport systems across Europe. In: *The 44th Annual UTSG (The Universities' Transport Study Group) Conference*, Aberdeen, UK, 4-6 January, 2012.
- Waygood, O. and Avineri, E. (2012) *CATCH (Carbon-Aware Travel Choice in the City, Region and World of Tomorrow): D1.3 Monitoring and evaluation report*. Project Report. University of the West of England, Bristol.
- Williams, D., Chatterton, T. and Parkhurst, G. (2012) Using Disruption as an Opportunity to Change Travel Practices In: *The 1<sup>st</sup> International Conference on Urban Sustainability and Resilience*, London, UK, 5-6 November, 2012.
- Williams, D., Chatterton, T. and Parkhurst, G. (2013) Assessing the Local Sustainable Transport Fund Submissions in Relation to Disruption. In: *The 45th Annual UTSG (The Universities' Transport Study Group) Conference*, Oxford, UK, 2-4 January, 2013.