



Transport
Research
Institute

Transport Research Institute

Edinburgh Napier University

Annual Report 2016

*Informing decisions.
Shaping policy.*

Our vision

“To be internationally recognised by academics, public policy makers, the transport industry and investors for the relevance, quality and rigour of our research in areas that contribute to a growing economy and more sustainable and healthy mobility.”



Welcome

Transport Research Institute Annual Report 2016

What is the Transport Research Institute and who is part of it?

The Transport Research Institute (TRI) is Scotland's largest and longest established transport research group. Established in 1996 we have an enviable track record in delivering high quality transport research, consultancy and other knowledge transfer projects in applied settings.

The skills TRI brings to the table covers everything from hard engineering through economics, business and mathematical modelling to sociology and psychology. As part of Edinburgh Napier University we offer a high level of objectivity, and we work with partners at other academic institutions across Scotland and beyond.

This combination of expertise and objectivity means we can provide rigorous and reliable analysis to help inform decisions and develop more effective policies. We have strong links with industry so we know what the real world applications of our work could be. We work at a strategic level with European Commission research programmes, as well as national and local governments around the world.

Staff associated with TRI are from various Schools and Departments across the University. A number of current TRI members are staff and research students based within the School of Engineering and the Built Environment. However, membership is open to University staff and research students working in transport related research areas across the university, including health and life sciences, computing science and business.

2016 HIGHLIGHTS



(pict. 1) Emine Akgun, Aisling Doyle and Douglas Norris, National Officer Scotland, CILT



(pict. 2) Richard Llewellyn receiving his prize

AWARDS

Aisling Doyle and Emine Akgun In March at the CILT Young Professional's conference, Aisling Doyle and Emine Akgun were awarded the winner and runner up prizes respectively in the annual student scholarship competition. Aisling and Emine took both prizes in the Transport category. They were invited to the CILT Scottish Regional dinner which was held in November. (pict. 1)

Eduardo Martin Moral, a student of the MEng Civil and Transportation Engineering (supervised by Achille Fonzone), was awarded the prize for the Best Paper from a Young Professional at the Scottish Transport Applications and Research (STAR) Conference 2016.



Richard Llewellyn: Double Win for TRI Roundabout Safety Research. A road safety improvement scheme at Sheriffhall Roundabout on the A720 Edinburgh City Bypass won two major awards, following research on its impact

by TRI. On 9 June the project team was presented with the John Smart Road Safety Award at the Chartered Institution of Highways and Transportation (CIHT) annual awards at a ceremony at the Tower of London. One week later, the project picked up the Excellence in Technology and Innovation award at the 14th annual Scottish Transport Awards in Glasgow. The scheme comprises an installation of intelligent road studs, which illuminate in conjunction with green traffic signals at the roundabout. It was the first of its kind in the UK. (pict. 2)



(pict. 3) Augustus Ababio-Donkor in the BMW i8 at the Electric Vehicle Event

EVENTS

Tariq Muneer: Research Excellence Award - Prof Tariq Muneer was awarded the Principal of Edinburgh Napier University's Research Excellence Award. This was presented at the university's annual research conference which was held at the Craiglockhart campus in June.

Street design and maintenance, and the Equality Act - January.

This training event, organised by Edinburgh Napier University, began with an overview of the legal framework within which designers and public roads authorities must operate. Through a series of case studies and updates on the latest available guidance, delegates learnt about some of the techniques currently being applied, including insights and advice from disabled users.

TRI hosted a **Future of Mobility in Edinburgh City Region** event in collaboration with Transport for Edinburgh. In August TRI hosted an invited group of key stakeholders from organisations including Lothian Health, Edinburgh Chamber of Commerce, Lothian Buses, Central Taxis and Transport Scotland, to discuss key transport challenges for the city region and how these might be solved.

TRI held its **2nd Annual Electric Vehicle Event** in the Rivers Suite at Edinburgh Napier University's Craiglockhart Campus. It was a great success with over 90 delegates attending. We will hold another one in October 2017. (pict. 3&4)



(pict. 4) Electric Vehicle Group

OTHER NEWS

TRI organised a joint meeting with the Department for Transport at their offices in London, between the DfT, research sponsors (EPSRC, ESRC, InnovateUK, Transport Systems Catapult, Transport Scotland, Welsh Government) and several members of the University Transport Studies Group (UTSG). The meeting provided an opportunity to improve the alignment of research priorities between academics and the end users of transport research. More targeted subject-specific meetings are intended to be held in future, in order to deepen engagement, and this represents an important step forwards in improving the impact of transport research at universities across the UK and Ireland.

Dr Jason Monios was invited to speak at a conference on Developing Scotland's International Seaports: Securing Economic Growth in Edinburgh in March. Dr Monios gave a presentation on "Logistical challenges facing Scottish importers and exporters".

Prof Tom Rye was invited by Edinburgh University's Edinburgh Centre for Carbon Innovation (ECCI) to be a keynote speaker at a Seminar on Smart Cities and Mobility in January. The event was organised for a number of notable Chinese visitors from organisations such as the National Development and Reform Commission, China International Engineering Consulting Corporation, CIECC Overseas Consulting Co., Ltd, China Railway Engineering Consulting Group Co., Ltd. to name just a few.

The Transport Minister **Derek Mackay** commissioned an independent review of the current system of managing the timing and quality of works in the road carried out by utility companies and by roads authorities themselves. In England and Wales newer laws apply to this work that give roads authorities greater powers over when and how the utility companies occupy the roads. Professor Tom Rye, produced a short briefing note reviewing the current evidence on the effectiveness of these powers in England and Wales.

Tom Rye, Richard Llewellyn and Suzanne Meade attended an in-house meeting and presentation held at Sustrans in Edinburgh. The aim of the meeting was to open dialogue and foster new research alliances between TRI and Sustrans and to inform each party about what we do. TRI identified opportunities for Sustrans' professional staff to gain specialist transport training through the existing SEBE programme that could lead to eventual MSc level qualification for Sustrans professional staff or to provided specialist area training. TRI also presented the areas of current transport research interests, involvement in national and international research programmes, committees and forums and finally two of the current PhD projects undertaken in ITS and Road Safety.

Professor Chandra Bhat Director of the Centre for Transportation Research, The University of Texas at Austin visited TRI to discuss joint collaborations with Professor Wafaa Saleh and TRI. Professor Bhat gave a presentation on "Predictive Analytics for Transportation Planning and Operations in a World of Big Data". The focus of the presentation was on the Big Data view of the transportation world, in which a whole host of equipment can act as sensors — legacy roadway systems, smart phones and GPS systems, and smart cars themselves. The key issue is how to deal with such voluminous amounts of incoming data per unit of time, and translate them into usable information for near-real time operations purposes or for longer-term planning purposes.

Professor Tom Rye was invited to give evidence to Scottish Parliament's Rural Economy and Connectivity Committee on comparative costs of transport in other EU countries. Prof Rye presented evidence to the Committee indicating that northern continental European countries such as Sweden and Germany are delivering new public transport infrastructure schemes such as rail and tram more cheaply than in Scotland, and also that subsidy for bus and rail in these countries appears to support a greater level of service and lower fares.

PANEL DEBATE

The effects of Brexit on the supply chain of transport professionals to industry is of critical interest to government and the private sector at present. Transport Research Institute lecturer and researcher, Richard Llewellyn, participated in a pre-dinner panel debate at a Burns Supper attended by senior representatives of the Scottish transport industry.

In recognition the challenges faced, a panel debate was held at a major industry Burns Supper held in Glasgow, chaired by BBC Scotland's Business and Transport Correspondent, David Henderson.

The event was attended by over 250 senior staff from national and local government and directors of major transport engineering consultants and contractors.

Richard Llewellyn was invited to speak on the panel to represent the higher education sector. The panel also featured former Westminster Minister of State for Transport, Dr Stephen Ladyman and Dionne Winter, Director of HeadNorth Consulting. (pict. 5)



(pict. 5) Richard Llewellyn

Both **Emine Akgun** and **Clare McTigue** were accepted on to the Global Challenges in Transport Programme to undertake the 'Governance, Policy and Delivery' course, which took place at the University of Oxford. The course examined the role of different actors, organisations and institutions in the creation, management and evolution of transport systems in various global contexts. It also included lectures and interactive workshops to explore how policies are formulated and implemented at a range of spatial scales, and how such interventions vary in terms of effectiveness and efficiency.

TRI hosted the annual seminar of the Scottish Transport Studies Group (STSG), Scotland's transport think tank established in 1984. The theme of the event was Transport Collaboration, Connectivity, Automation and Governance. **Dr Jason Monios** is a committee member of the STSG.

Tom Rye was appointed Chair and **Jason Monios** Secretary for Universities Transport Studies Group (UTSG). A number of TRI staff and students attended the UTSG conference in Dublin in January (pic 6). TRI assisted Trinity College in the administration of delegate registrations.

Dr Achille Fonzone was invited to deliver a keynote presentation at the 5th Polish National Scientific-Technical Conference on Trip Modelling and Travelling Forecast, held in Krakow in June. He gave a talk on "Who uses Boris bikes? – An application of cluster analysis to 'not small' data", in which he presented a characterisation of the users of the London bike sharing scheme based on data provided by Transport for London.

Dr Achille Fonzone participated in the meeting of the European Metropolitan Transport Authorities in Budapest in May. Prof Jan-Dirk Schmoeker from Kyoto University and Dr Fonzone presented and discussed the first results of their research on public transport fare structure. Achille Fonzone published a report on public transport fare structures for the association of European Metropolitan Transport Authorities (EMTA).

STAFF NEWS

Lucy Downey joined the Transport Research Institute as a Research Assistant in November 2016. (pic. 7)

Margaret Grieco, Professor of Transport & Society, retired from the Transport Research Institute.



(pic. 7) Lucy Downey

ACADEMIC VISITORS

The following visiting researchers joined us during 2016:

- Hiroki Yamazaki, Assistant Professor, Kyoto University, Japan - Traffic Accident Database in Japan; Collective data of people behaviour/detector about reliability issue; some Driving Simulator's results in this year.
- Stephane Magniol, Engineering School ENTPE at Université de Lyon, France for 4 months - Pedestrian behaviour according to the weather condition.
- Mr Shahbaz Altaf, Belgium for 2 months - Sustainable mobility
- William Fu, Australia for 2 months.
- Federica D'Onghia, Politecnico di Bari, Italy for 2 months - Spatial analysis of London Bike Sharing Scheme. In particular, how she can use QGIS software to analyse a dataset of the bike hires in London.
- Rita Binetti, Politecnico di Bari, Italy for 2 months - Road Safety. Analyzing Scottish accidents database to calibrate an American Function (SPF - Safety Performance Function) and make it suitable for Scotland. This function should help government to choose in which trunk of road is more urgent to intervene and in which way to obtain the greatest benefit.
- Qiwen Du, Beijing Jiaotong University – exchange student from China.
- Anders Wretstrand, Lund University, Sweden.
- Prof Chandra Bhat visited TRI from Transportation Research, University of Texas at Austin.



(pic. 6) TRI staff attending the UTSG Conference in January in Dublin. From left to right: Suzanne Meade, Emine Akgun, Tom Rye, Jason Monios, Kathryn Stewart, Faqhrul Islam and Mohamed Mohamed

STAFF ACTIVITIES 2016



(pict. 8) Professor Tom Rye

Professor Tom Rye

Tom project managed three EU projects during the year, CIVITAS CAPITAL, CIVITAS DYN@MO and Push and Pull, and won a new Horizon 2020 project, PROSPERITY, which started in September 2016. He was a keynote speaker at the Annual Conference of the Society of Chief Officers of Transport in Scotland (SCOTS), talking on comparative public transport policy. He continued in his role as a member of the Editorial Board of Transport Policy Journal, the European Transport Conference's Sustainable Transport and Climate Change Committee, the Programme Committees of the UK Transport Practitioners' Meeting and the Scottish Transport Applications and Research Conference. He was also invited to join the Editorial Board of the new international journal, Transportation Demand Management. He appeared several times on Scottish TV and radio during 2016 speaking about topics including bus priority, transport spending, the Edinburgh Tram inquiry, and integrated public transport ticketing. He also retained his role as a member of the International Advisory Group of the Swedish National Public Transport Knowledge and Research centre, attending and contributing to its biennial conference in Stockholm. He continued in his role as Director of the Scottish Sustainable Transport lobby organisation, Transform Scotland, and as a member of the City of Edinburgh's Transport Forum, and its Urban Design Panel (along with colleagues from TRI). He also secured a new role as a national (UK) trustee of the charity for pedestrian issues, Living Streets. He gave evidence on public transport governance and costs to the Scottish Parliament's Rural Affairs, Transport and Connectivity Committee, on climate change and transport to its Environment, Climate Change and Land Reform Committee, and on infrastructure costs to the Scottish Council for Development and Industry's Connectivity Inquiry. In September, Prof Tom Rye gave evidence on the progress on reducing climate change impacts from transport to the Environment, Climate Change and Land Reform Committee of the Scottish Parliament along with a number of experts from other sectors such as agriculture, housing and energy. (Email: t.rye@napier.ac.uk)



(pict. 9) Dr Andrew MacIver

Dr Andrew MacIver

Dr Andrew MacIver is Subject Group Leader, Civil & Transportation Engineering; External Examiner, Caledonian College of Engineering, Muscat, Oman; Programme Leader, BEng Civil Engineering, Yangon, Myanmar; Visiting Lecturer, Shanghai Normal University; and Member of Edinburgh Urban Design Panel. (Email: a.maciver@napier.ac.uk)

Dr Jason Monios

Dr Jason Monios published several journal papers and book chapters, in addition to a research monograph for Routledge, Intermodal Freight Terminals: A Life Cycle Governance Framework. He reviewed for several journals and presented at a number of conferences, including chairing a session on hinterland transport at IAME Hamburg. He was invited to present his research at a seminar in January organised by the Kühne Logistics University in Hamburg and was invited to speak at a conference on Developing Scotland's International Seaports: Securing Economic Growth in Edinburgh in March. He continued to sit on the Edinburgh Urban Design Panel. He was appointed a Chartered Member of the Chartered Institute of Logistics and Transport, and continued as fellow of the Royal Geographical Society, member of the International Association of Maritime Economists and committee member of the Scottish Transport Studies Group. He was external examiner for two PhDs, at the University of Tasmania and Liverpool John Moores University. He was also visiting researcher at the University of Gothenburg and the University of Manitoba. (Email: j.monios@napier.ac.uk)

Dr Yuhong Wang

Dr Yuhong Wang served as a Member of the International Programme Committee of the 6th International Conference on Logistics, Informatics and Service Sciences (LISS 2016). In November 2016, he was invited by the Faculty of Maritime and Transportation at Ningbo University to attend the 30 Years' Anniversary of Ningbo University, and delivered key speech at the opening ceremony.

STAFF ACTIVITIES 2016 continued

With the support of the ENRICH project, Dr Yuhong Wang and Beijing Jiaotong University, China organised for two TRI PhD students, namely Shelly-Ann Julien and Faqhrul Islam, to participate in the Summer School of Sino-EU Doctoral School for Logistics, Information, Management, and Service Science. (pic. 10) This was held in July/August and was a great opportunity to promote discipline integration and innovate doctoral training in field of modern Logistics and management science. (Email: y.wang2@napier.ac.uk)



(pic. 10) Faqhrul and Shelly-Ann attending the Summer School in China

Dr Kathryn Stewart

Dr Kathryn Stewart has continued to be chair of the programme committee for the STAR conference and represents TRI at the Edinburgh Transport Forum. Kathryn is also a member of the Scottish Branch committee for the IMA (Institute of Mathematics and its applications). She represented TRI with an invited talk on "lessons learned from EU projects" at an Active Travel meeting organised by Holyrood events in December. (Email: k.stewart@napier.ac.uk)

Dr Achille Fonzone

In December, Dr Achille Fonzone spent a month as Visiting Lecturer at King's College London, where he worked with the Artificial Intelligence team to develop common research on taxis and delivered a seminar on "Why ITS data are important if you are interested in public transport passenger behaviour". Dr Achille Fonzone was appointed member of the EPSRC College of the Peer Reviewers. A paper from Dr Achille Fonzone and Eduardo Martin-Moral, a graduate of the MEng in Civil and Transport Engineering supervised by Achille, was awarded the best paper from a Young Professional at the Scottish Transport Applications and Research 2016.

Dr Achille Fonzone attended a meeting of the Department for Transport's Science Advisory Council (SAC) in April. The Council, chaired by Professor Lord Mair, provides strategic level scientific advice and challenge to the department. Dr Fonzone was invited to discuss on behalf of Universities Transport Study Group how DfT can enhance its collaboration with Universities to generate the evidence needed for sound transport policy. Dr Achille

Fonzone attended a meeting of the UITP UK members in London in November in which delegates discussed a draft of UITP Policy Board papers and the upcoming UITP Trends Report 2017. (Email: a.fonzone@napier.ac.uk)

Richard Llewellyn

Richard Llewellyn was appointed Vice Chair of The Chartered Institution of Highways & Transportation (CIHT) for 2016/2017. He has been a committee member since 2013. A group of twenty senior officials from Tianjin, China visited Scotland at the end of June for an extended 5 day visit of government, commercial, academic and cultural meetings following such meetings at Oxford University. The purpose of the training/fact finding trip was to gain leading edge insights into urban development to plan and deliver green, clean, harmonious and human friendly Tianjin as it grows. Richard Llewellyn gave a presentation on urban street design in Edinburgh and went on to discuss how Tianjin could meet their aspirations to be a human friendly city in an interactive Q&A session. (Email: r.llewellyn@napier.ac.uk)

Professor Wafaa Saleh

Professor Wafaa Saleh continued chairing the committee of the International Symposium on Travel Demand Management at the 8th meeting which will be held in Taipei in Taiwan in September 2017, being a member of the scientific committee of the International Symposium on Transportation Network Reliability (INSTR) with the 6th meeting will be held in Sydney in January 2018. Wafaa visited King Saud University in Riyadh and gave three presentations there on transport sustainability and the community and international transport research and publications. Wafaa visited Qatar University as part of the joint project funded by the Qatar Research Foundation on pedestrian crossing behaviour to improve pedestrian accident rates, severities road safety in Doha, Qatar. Wafaa has attended a number of national and international conferences and events.

Wafaa is leading the TRI Middle East Research Centre which is being launched in 2017 by the Transport Research Institute (TRI) and the "AraB Academy of Engineering and Technology – "ABET". The aim of the academy is to provide support for high-calibre students and researchers who are keen to develop their research and investigatory competences, especially from the Middle East.

She is continuing with PhD supervision at Edinburgh Napier University to successful completions as well as being examiner at a number of international universities in the area of transport modelling and travel demand management. Wafaa is continuing to be active in terms of publications and research collaboration with a number national and international colleagues, a peer reviewer and a member of the editorial board of a number of international journals. Wafaa Saleh has been active in developing the Engineering laboratory at the School of Engineering and the Built Environment and supervising a number of international student placements and academic visitors from a broad range of countries at the lab. (Email: w.saleh@napier.ac.uk)

Dr Jonathan Cowie

Jonathan Cowie has been continuing his research into consumer sovereignty and the operation of transport markets, as well as carrying out associated research into rail fare regulation in the privatised British passenger railway. In collaboration with Professor Steve Ison at Loughborough University, Jonathan has also been editing and compiling the Routledge Handbook of Transport Economics, which will be published in August 2017. Jonathan Cowie gave a presentation to a delegation from the Chinese Ministry of Transport on the regulation of public transport industries in Great Britain in October. (Email: j.cowie@napier.ac.uk)

Dr Damian Stantchev

Damian continued in his role as External Examiner at the University of Agder, Norway and is supervising a PhD student in the Business School who is conducting research in humanitarian logistics, jointly with Dr Miles Weaver and Prof Grant MacKerron from the Business School.

Dr Damian Stantchev became a member of the International Editorial Board of the 2016 Yearbook, a peer-reviewed compendium of selected publications issued by the University of National and World Economy (UNWE) in Bulgaria. The UNWE is a leader among the higher educational institutions in Southeastern Europe in the fields of economics, management and administration, law and politics. Dr Damian Stantchev presented a paper (jointly written with Prof Tom Rye) on a set of indicators for sustainable mobility in European cities at the NECTAR International Workshop in Brno, the Czech Republic. The research conducted for the purposes of this paper was part of the CIVITAS CAPITAL project. (Email: d.stantchev@napier.ac.uk)

Professor Tariq Muneer

Prof Tariq Muneer was invited to give a keynote address at an Experts Group Workshop on "Electric Vehicle Technologies and Markets in India" in January. Prof Tariq Muneer also gave a keynote address about sustainable energy research to Sultan Qaboos University in Oman in December. A number of Senior Civil servants and policy makers also contributed to the event. This Experts meeting served to provide a platform for knowledge sharing between different stakeholders. This will be useful in recommending policy, regulatory and financial interventions which can be suggested for consideration during the formulation of the upcoming Union Budget 2016. (Email: t.muneer@napier.ac.uk)

Professor Christiane Bielefeldt

Professor Christiane Bielefeldt continued as leader of the Unit of Assessment for Civil and Construction Engineering for Edinburgh Napier University for the Research Evaluation Framework 2020.

Lucy Downey

Lucy joined TRI as a Research Assistant in November 2016. Lucy has been working with Qatar University, investigating pedestrian crossing behaviour to improve pedestrian accident rates and severities in Doha. The research involves investigating pedestrian crossing behaviour at junctions and mid-block locations with

different characteristics (e.g. road speeds, pedestrian volumes and traffic control measures). The study design includes a literature review, video recording and data extraction, statistical analysis and simulation modelling. It is anticipated that the findings will provide guidelines to improve existing simulation models. In addition, recommendations will be made towards policies to improved pedestrian safety and reduce accidents as well as improving the crossing environment for pedestrians. (Email: l.downey@napier.ac.uk)

Professor Keith Dickinson

Prof Keith Dickinson continues to serve on the Advisory Board Committee has taken an active role as Emeritus Professor of Transportation at TRI. He retains his broad interests in traffic engineering and is currently supervising a PhD student who is studying the impact on travel behaviour of Ubiquitous Real Time Passenger Information.

Professor Mike Maher

Professor Mike Maher is a Professor Emeritus. He continues to be on the Editorial Advisory Board for Accident Analysis and Prevention. He is involved in two Aecom/Atkins projects for the DfT on (i) the impact of 20 mph speed limits and (ii) the effect on accidents of the recent increases in HGV speed limits, advising on statistical methodology. He is an honorary professor at University College London.

David Hunter

David Hunter has been an Associate Research Fellow of TRI since June 2015. David has long been involved in developing accessible and sustainable transport services and is active in a number of voluntary, professional and statutory bodies including the Mobility and Access Committee for Scotland. He authored Trends in the Use of UK dial-a-ride services in 2016 and helped organise TRI's seminar on Transport and the Equality Act in January 2016.

David Scotney

David Scotney (Associate Research Fellow) is a continuing board member of the Tayside and Central Scotland Regional Transport Partnership (Tactran), a reviewer for the Transport Planning Society's Professional Development Scheme and a programme committee member for the STAR conference. He is undertaking research on mainly historical aspects of transport development and their potential lessons: during 2016 he both continued work with colleagues in TRI on the differing specifications and costs of transport provision in various countries, as well as collaborating with specialists from Russia on the development and utilisation of the formerly extensive narrow gauge rail networks in Russia and the USSR.

Yvonne Lawrie

Yvonne Lawrie, School Support Administrator, continues to provide administrative support to TRI's Director, staff, PhD students and visiting students. Yvonne organised the 2nd annual Electric Vehicle Event and assists in the organisation of TRI's other events, seminars and Advisory Board meetings. She is involved in preparing TRI's marketing material, update of the website, stakeholder engagement and general enquiries.

PROJECTS ACTIVE IN 2016

Projects that TRI researchers participated in during 2016 are listed below, with details of funding bodies and collaborating partners.

SUSTAINABLE ENERGY AND TRANSPORT

Tom Rye: **CIVITAS DYN@MO: DYNamic citizens @ctive for sustainable Mobility** (EU Framework Programmes funded by European Commission (FP7)) [ends 30/11/2016]
CIVITAS-DYN@MO is an ambitious project with strategic importance to sustainable mobility planning in four dynamic European cities. Aachen (DE), Gdynia (PL), Koprivnica (HR) and Palma (ES) will jointly develop "Mobility 2.0" systems and services, implement city and citizen-friendly, electric mobility solutions and vehicles, and engage in a dynamic citizen dialogue for mobility planning and service improvement.

Tom Rye: **PUSH&PULL: Parking management and incentives as successful and proven strategies for energy-efficient urban transport** (EU Framework Programmes funded by Intelligent Energy Europe) [ends 28/02/2017]

The project aims to improve urban mobility in European cities by means of parking space management combined with mobility management measures. By introducing paid parking, increasing parking fees, reducing or restraining parking supply or implementing comparable measures, car drivers will be pushed to use more sustainable transport. At the same time, the income generated from parking space management can be used for incentives to promote alternatives, thus pulling or attracting users towards public transport, walking, cycling and other sustainable modes.

Tom Rye: **PROSPERITY** (EU Framework Programmes) [September 2016 - 31/08/2019]
PROSPERITY is an Horizon 2020 project in the CIVITAS family of projects on sustainable urban mobility. It aims to enable and create a culture shift in government agencies and local authorities to support Sustainable Urban Mobility Plans (SUMP). The project focuses on promoting and supporting a broad take-up of SUMP especially in countries / regions and cities where the take up is so far so low. It aims to achieve this by providing mechanisms and tools for national / regional agencies to take a leading role in the development of SUMP; and building professional capacity through peer-to-peer exchange programmes and tailor made training programmes on various aspects of SUMP and/or innovative approaches in sustainable urban mobility. This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 690636.

Tariq Muneer: **EPSRC-ENERWATER** project

The Enerwater project involves the research and development of novel systems to recover and re-distribute energy in food processing and manufacturing premises, especially where there are demands for refrigeration and heating on-site and localised. The project also aims to optimise the production of heated water as a process requirement for heating, cleaning or sterilisation, by re-cycling both the waste heat and treating the waste water stream, so that it may be recoverable and re-cycleable. The user industry attraction will be local energy recovery for useful purposes, including water supply streams. Treatment of water itself for recycling is an additional attraction reducing external energy, resource treatments and requirements. The proposed developments may be applied within an industrial complex that can provide source and "sink" needs, or inter- business or community to other industrial or domestic premises. This approach therefore minimises the industrial consumption of energy and diverts it to other localised energy users, which could be a range of uses, such as aligned similar site or other local heat consuming processes or domestic or office localised heating needs."

Dr Mark Taylor: **Intellibike: a novel approach to engineering condition assessment of cycling infrastructure.**

The UK National Cycle Network comprises 23,660 km of cycling and walking paths of which a significant percentage is dedicated off-road infrastructure. This represents a significant civil engineering infrastructure asset that currently contributes to the provision of a sustainable transport mode option nationwide. Commuting and recreational cyclists have observed the often hazardous conditions on these paths. There are various simple measures that could be taken to improve the maintenance of such off-road paths. Reliance on walk-over surveys (direct visual inspection) and path users notifying the local authority may not be tackling maintenance in a resource efficient manner. The proposed inspection method includes the use of an instrumented bicycle to examine cycle path condition through user perception of satisfaction and quality. A questionnaire was conducted to identify the attributes of off-road cycling infrastructure people find most important in relation to their personal satisfaction. An exploratory factor analysis was undertaken on perception study data to elucidate the determination of the variables associated with perceived user satisfaction. The study has shown that people find maintenance issues to be of high importance, especially surface issues. The results were used to assist the creation of dedicated user perception based surface condition rating-scales. The Intellibike will be used to assist local authorities in the collection of cycling infrastructure asset management condition data and ensure more efficient use of maintenance resources.

PROJECTS ACTIVE IN 2016 continued

MOBILITY MANAGEMENT AND TRAVEL PLANNING

Tom Rye: **CIVITAS CAPITAL - making the best of CIVITAS** (EU Framework Programmes funded by European Commission (FP7)) [ends 31/08/2016]

The mission of CIVITAS CAPITAL is to contribute significantly to the goals of the EU's Transport White Paper by capitalising systematically on the results of CIVITAS and creating an effective "value chain" for urban mobility innovation. CAPITAL will initiate and support a mainstreaming process of CIVITAS principles based on a strengthened community of stakeholders. CAPITAL will help CIVITAS to build the bridge towards a more advanced identity within Horizon 2020. It will help to create a more structured link with large-scale deployment in support of Transport White Paper goals.

Wafaa Saleh: **Qatar Pedestrian Research** (Research - Other Sources funded by Qatar National Research Fund) [ends 31/03/2018]

Investigating pedestrian crossing behaviour to improve pedestrian accident rates and severities in the State of Qatar

The study aim is to investigate pedestrian crossing behaviour at high accident rate locations in urban areas in Doha by developing an in-depth understanding of pedestrian's interaction with each other and with motorised traffic. The investigation will model pedestrian crossing behaviour at 24 junctions and mid-block locations with different characteristics (e.g. road speeds, pedestrian volumes and traffic control measures). The study design includes a literature review, video recording and data extraction, statistical analysis and simulation modelling using VISWALK PTV software. It is anticipated that the findings will provide guidelines to improve existing simulation models. In addition, recommendations will be made towards policies to improved pedestrian safety and reduce accidents as well as improving the crossing environment for pedestrians. (Email: w.saleh@napier.ac.uk)



(pict.11) Professor Wafaa Saleh with Lucy Downey

PROJECTS ACTIVE IN 2016 continued

MARITIME TRANSPORT & LOGISTICS

Yuhong Wang: **ENRICH: EC China Research Network on Integrated Container Supply Chains** (EU Framework Programmes funded by Marie Curie - International research staff exchange scheme (IRSES))

The overall aim of this exchange programme is to bring together an international team of researchers to establish a research network with a wide variety of skills in operations research, safety and security studies, green logistics, economic modelling, ICT and intermodal management to develop a container supply chain (CSC) integration methodology. This project consists of 8 beneficiaries: 1. Liverpool John Moores University, UK (Coordinator) 2. Edinburgh Napier University, UK 3. University of Antwerp, Belgium 4. University of Liverpool, UK 5. Molde University College, Norway 6. Wuhan University of Technology, China 7. Beijing Jiaotong University, China 8. Gothenburg University, Sweden.

Yuhong Wang: **SeaConAZ** (EU Non Framework Programmes funded by Research Council of Norway)

The SeaConAZ project represents a holistic perspective on the supply chains of consumables produced in China destined for Norwegian retailers, with references to similar structures pertaining to Swedish and UK markets. The focus of the project is on exploring the potential of a system changing approach, where the point of cross-docking and consolidation of less than full container consignments (LCL) into full container loads (FCL) for a single, or cluster of, retailing points is moved from Europe to China.



(pict. 12) Dr Jason Monios

CONSULTANCY PROJECTS

Jason Monios: **Freight transport in Scotland, Inquiry Adviser** (Consultancy funded by Scottish Government) (picture 12)

Richard Llewellyn: **Edinburgh Street Design Guidance** (Consultancy funded by WSP Group)

Tom Rye: **ENDURANCE QAFG** (Consultancy funded by Act Travel Wise)

Tom Rye: **Scandinavian Bus Regulation and Contracting** (Consultancy) [June 2016 - Jan 2017].

Scandinavian Bus Contracting and Franchising for the Urban Transport Group. The main aim of this project was to provide a summary of experience over the past 20 years in Norway, Denmark and Sweden of local and regional bus service franchising and the types of contracts used in their franchises. The work was commissioned by the Urban Transport Group (formerly PTEG) to provide more detail on the Scandinavian experience of this topic at a time when several areas of England are considering moving their bus service provision to a franchised model when the current Buses Bill becomes law. The project was carried out in collaboration with UrbaNet (Norway), Inno-V (Netherlands), and the K2 public transport research centre in Lund, Sweden. Reviewing experience of bus regulation and contracting in Sweden, Norway and Denmark and comparing it to the situation in GB outside London.

Tom Rye: **Evaluation of Models for Regional Transport Partnerships, for SESTRAN (Southeast Scotland Transport Partnership)**. [Oct 2016 – Mar 2017].

The Edinburgh Region saw much work during 2016 on a City Deal financing bid to the UK Government. As part of this, there was consideration of the transport governance requirements of a strengthened region. SESTRAN, the current regional transport partnership, commissioned TRI to research the way in which different models of regional transport governance could deliver outcomes important to the City Deal.

PhD Student: Augustus Ababio-Donkor

Research Topic:

Applying behavioural economics in modelling and analysing the demand for public transport using MINDSPACE and Structural Equation Modelling

The demand for travel is derived from people need for social and economic activity participation, this is necessary for human existence, the level of this activity participation, measures the economic vibrancy and success of a city and mostly correlate the level of road traffic congestion. Meanwhile it is conventionally accepted that the most efficient and sustainable way of addressing the travel demand for activity participation is through the use of public transport, this has occasioned several transport related research and subsequently, schemes to promote public transport patronage.

PHD STUDENT RESEARCH TOPICS IN 2016

Notwithstanding traffic in major UK cities maintain an upward trend whilst public transport ridership is recording a decline. It still remains uncertain as to which factors are most important in influencing mode choice decisions.

Traditional travel demand models explained travel choices based on the attributes of the travel modes available and the socio-economic characteristics of the decision maker, this method has been widely criticised for not accounting for attitudinal, social and psychological factors which have been found to influence travel choices, this has led to the development of latent/hybrid choice models that account for the heterogeneity of decision makers by incorporating elements like comfort, safety, risk etc in the decision making process.

However, recent studies in the field of cognitive psychology, behavioural economics and consumer behaviour suggest that consumer decision is largely influenced by a framework called "MINDSPACE" (mnemonic for Messenger, Incentive, Norm, Default, Salience, Priming, Affects, Commitment and Ego), it is therefore suggested that individual transport behaviour could be modelled and better explained using MINDSPACE.

This research therefore aims to investigate the effect of MINDSPACE in travel decision making and build upon the extant travel choice models by incorporating elements of MINDSPACE as latent factors in calibrating a latent travel mode choice model using structural equation modelling.

PhD Student: Benjamin Afuye

Research Topic:

Investigation of operational and perceived characteristics of Buses in Edinburgh

Improved urban bus operational performance characteristics provide significant opportunities to generate a number of positive outcomes such as increased public transport modal shift, reduction of road traffic congestion and the emissions of greenhouse gases and local pollutants. Vehicle Speed-time profile factors are often complex, changes over time and some occurs in so many directions. This study is aiming at investigating performance of buses in Edinburgh utilising some readily available advanced technology. The driving cycle of typical buses in Edinburgh will be measured, analysed and assessed. The characteristics of the driving cycles of the different types of buses will be used to assess the operational performance of each type of studied bus. Then the perceived performance of each of these buses measured by the emotional and reported reaction of the users will also be analysed and compared. Finally, a detailed comparison and analysis of the two results will be performed to assess the operational and perceived quality of Edinburgh buses. The work is novel in a number of areas: a) the investigation and comparison of the driving cycle of different types of buses in Edinburgh b) the use

of advanced technology to monitor and analysis passengers' responses to bus operations c) comparing operational characteristics of buses with perceived performances obtained and drawing conclusions on any links if applicable.

PhD Student: Joseph Appiah

Research Topic:

Investigation of car following modelling methodology using traffic sensors

A private vehicle (i.e. instrumented vehicle) was equipped with Radar sensors (both front and rear of vehicle), forward and rear facing video cameras connected to a Video VBOX, speed and distance measuring device and in-vehicle laptop computer logging vehicle speed was developed and utilised to collect microscopic traffic flow driver behaviour data within and around the City of Edinburgh in Scotland, UK. The research investigates the driving behaviour and car following models and techniques to provide better understanding of driver-vehicle and inter-vehicle interaction in a car following situation. It also investigates driving behaviour and traffic flow data collection techniques to provide better ways to develop new advance data collection system to improve the collection of microscopic driver behaviour data. The study proposes a number of car following models including two-leader car following models and bus following models to give better understanding of driving behaviour in a car following scenario in a real world situation.



PHD STUDENT RESEARCH TOPICS IN 2016 continued

PhD Student: Emine Zehra Akgun

Research Topic:

Using local transport policies to support urban freight consolidation centres

Urban freight transportation (UFT) is concerned with the movement of goods in urban areas such as cities, towns and suburbs. Movements of goods indicates to delivery, collection and transit pass of the goods. Cities accommodate various economic and social activities, such as working, living, leisure as well as production. Increasing population in cities will boost the flow of goods to and from urban areas as demand and supply for certain goods and services will increase. Freight transportation contributes to local economies by producing wealth and affecting the cost of goods sold by influencing cost of freight transport, however it causes decent amount of air pollution (CO, CO₂, NO_x, PM₁₀), noise nuisance, and congestion. Local authorities and businesses initiate various mitigation strategies in order to avoid hazardous impacts of road transportation such as low emission zones, time-window restrictions, shifting deliveries to off-peak hours, improvements in the fuel efficiency of vehicles, and use of urban consolidation centres (UCC).

For many European countries characterized by intense urbanization, it becomes inevitable to develop an understanding of UFT requirements in local transport planning and developing comprehensive UFT-specific measures and policies. Scotland is the country, where its big cities are characterized by higher urban density. It is known that there is a significant public sector interest in Scotland for consolidation centres but the fact that none are in operation suggest difficulties in making them work and the fact that no private organization has developed; one suggests there is limited private sector interest. Previous research in other countries shows that they face many challenges and only few succeed, often with the help of supportive policies or specific collaboration situations. However, only limited work has been done on the identification of supporting policies to establish efficient UCC models. Therefore, the aim of my study is to investigate the relationship between urban consolidation centres and supportive urban freight policies, in particular to explore how and which supportive urban freight policies would be used to make consolidation centres more feasible.



PhD Student: Aisling Doyle

Research Topic:

Thermal performance and optimisation of the heating and cooling system of the electric vehicle

The conventional vehicle can heat its cabin space with recyclable heat energy from the vehicle's internal combustion energy. However, the electric vehicle required energy from its primary battery to produce heat energy. This research looks at how the electric vehicle's heating and cooling system may be optimised by the implementation of an auxiliary system powered through solar means. This research develops a numerical algorithm to predict temperature and thus energy required to heat or cool the cabin space can be obtained. This developed algorithm may assist in overcoming the challenge of 'range anxiety' that hinders the penetration of electric vehicles into the automobile market.

Aisling Doyle (PhD student) represented TRI at the Scottish Government's 'Developing Scotland's Climate Change Plan' event in December in Pollock Halls. The event brought together stakeholders from across all industries that contribute to anthropogenic activity and discuss from various experiences how 'hard' issues should be put towards the government for the next Plan. Workshops on electricity, transport, waste, residential, agriculture and gave delegates the opportunity to provide their input on these and other issues. The government gave some insights into the likely content of the new climate change plan to be published early in 2017.

Aisling presented a paper at the 23rd Intelligent Transport Systems World Congress at the Convention and Exhibition Centre in Melbourne in October 2016.

PHD STUDENT RESEARCH TOPICS IN 2016 continued

PhD Student: Faqhrul Islam

Research Topic:

Impact of Ubiquitous Real-time Passenger Information (URTPi) on travellers' choice

Faqhrul Islam is finishing his second year as a PhD research student at TRI. Since joining in March 2015, he is conducting research on the Impact of state-of-the-art travel information.

Traveller information systems have always been an integral part of transport systems. From printed timetable to recent smartphone app, travel information has gone through many changes for over 150 years. However, the aim of travel information provision remains the same: to make the journey seamless for the travellers allowing them to choose modes and routes, to increase traffic safety and a better management of traffic flow. Real-time travel information systems deliver information in real-time to a wide range of travellers using different modes, with the aim of making their travels faster and smoother. This project mainly focuses on the use of ubiquitous real-time passenger information as well as the impact of information on travellers' choice.

PhD Student: Shelly-Ann Julien

Research Topic:

International Trade Economics, firm/industry level evolutionary technical efficiency and productivity

This research investigates evolutionary technical efficiency and productivity of Small Island Developing States (SIDS) ports from, 2001-2011. The sample covers 69 worldwide ports of which major top ports, are included as a benchmark for which we compare the performances of the Caribbean and Pacific SIDS. A non-parametric DEA-Malmquist Productivity Index (MPI) model is introduced to measure the changes in efficiency and productivities, as a result of progressive port development over the years, impacting scale, pure and technological improvements. The time series analysis results reveal a 72% average technical efficiency for Top ports, compared to 60% for the SIDS group. Moreover, productivity growths of SIDS increased by 3.1%, with scale improvements being the main contributor in the Caribbean, and pure efficiency in the case of Pacific ports. This heterogeneity within the SIDS group, tells that regional port strategy, may actually play an integral part in possibly impacting port productivity and efficiency. This research seeks to contribute to existing literature on port efficiency and productivity, by focusing on Small Island Developing States, and the factors that impact their performances. It also brings a practical contribution to the future development of these ports, as is the agenda of local, regional (CARICOM), and international organizations (United Nations).

Shelly-Ann teaches the Principles of Economics and World Economy at Craiglockhart Campus. She is also a member of the organizing committee of the 14th annual Young Professionals Conference, hosted by the Chartered Institute for Logistics and Transport (CILT). Shelly-Ann attended the 3rd Annual Scottish Transport Conference, 2016 which was held in Edinburgh.



PhD Student: Clare McTigue

Research Topic:

Implementation of Transport Policies at a Local Level

The first stage of this project looks at the theoretical approaches to policy implementation and focuses on top-down, bottom-up and hybrid theories and frameworks to help understand the barriers and enablers that have an impact on policy implementation. A new hybrid theory is developed which is a 10-point framework on what is needed for successful implementation.

The second stage of this project includes the data collection. Mixed data collection methods are used to identify the keys barriers associated with developing and implementing sustainable transport policies. These methods include online surveys with 56% of public transport officers in the UK and follow-up telephone interviews with 10 of those officers. It also includes four case studies with particular emphasis on cities that had previous involvement in bus projects or schemes. These case studies include face-to-face interviews with experts who can give their opinions and perceptions and comment on how bus policies are implemented in their area, and the challenges faced in the implementation process.

PHD STUDENT RESEARCH TOPICS IN 2016 continued

The final stage of this project includes triangulation of the data collection methods and incorporation of the McTigue et al. (2016) hybrid theory. This project particularly focuses on bus policy because it is an under-researched area and evidence of this gap means that there is an opportunity to understand what factors can help or hinder successful implementation and how this can in turn improve bus services and infrastructure. The findings from this research will inform policy makers, local authority staff, regional transport partnerships, bus operating companies and other practitioners working within the field of transport.

Clare McTigue presented a paper at the 14th World Conference on Transport Research which was held at Tongji University, Shanghai, China in July, titled: 'The role of reporting mechanisms in transport policy implementation by local authorities in England. McTigue, C., Rye, T., Monios, J. (2016)'

PhD Student: Suzanne Meade

Research Topic:

Vulnerable Road Users Safety Performance in Scotland

Vulnerable Road User (VRU) road safety performance has lagged behind the improvements achieved for motorised users despite having the same road safety targets for reduction across EU and UK. Scottish policy aspirations aim to increased mobility alongside commitments to improve road safety, which poses the question: Why has VRU road safety performance not improved in tandem with motorised modes over the past decade in Scotland?

The aim of the research is to investigate whether there is a VRU SiN effect in Scotland due to increased mobility and examine if there are wider spatial, demographic and policy differences affecting VRU safety performance.

Equity within the transport system for VRU is essential for those who do not have the choice or access to a private car due to deprivation, age, gender, disability, and location. The current method for gauging performance is the use of global number of fatalities per population and to a lesser extent fatalities expressed by kilometres travelled. It is hoped that this research will develop safety performance indicators at a local level, based on risk equity rather than aggregate global numbers of fatalities within a population.

PhD Student: Mohamed Jama H Mohamed

Research Topic:

Impact of UberPOOL Ridesourcing Services on Public Transport

This research looks at the impact of new disruptive mobility options, such as UberPOOL, with the aim of understanding and quantifying the impact of UberPOOL on traditional public transport, both in terms of policy and operations and to develop clear understanding of ridesourcing services and their impact on a city's mobility options.

Using London as the case study city, key objectives include improving understanding of overall impacts of new technology-enabled ridesourcing mobility services such as UberPOOL and identifying opportunities and challenges, including potential for positive and negative outcomes for Public Transport Authorities and ridesourcing service providers.

The research is anticipated to shed light on the impact of UberPOOL on public transport using empirical evidence to quantify its impacts and proposition a framework, which transport authorities can use, in order to collaborate with service providers and maximize the benefits from these new technologically driven and on-demand mobility services.

PHD COMPLETIONS IN 2016

Moira Weir – June 2016: The role of taxis in the supply of transport to the night time economy and identification of the barriers to the full realisation of that role (mentored by Jonathan Cowie & Kathryn Stewart)

Xavier Gese Aperte – August 2016: Analysing and modelling motorways of the sea in Spain (mentored by Prof Alf Baird & Kathryn Stewart)



TRI 2016 PUBLICATIONS

Acciaro, M., Monios, J. (2016). **Assessing the efficiency impact of cascading effects on global container networks.** In: Proceedings of the International Association of Maritime Economists (IAME) Conference.

Bergqvist, R., Monios, J. (2016). **Inbound logistics, the last mile and intermodal high capacity transport – the case of Jula in Sweden.** World Review of Intermodal Transport Research, 6(1), 74-92.

Cai, Z., Ofterdinger, U. (2016). **Analysis of groundwater-level response to rainfall and estimation of annual recharge in fractured hard rock aquifers, NW Ireland.** Journal of Hydrology, 535, 71–84.

Cai, Z., Jin, T., Li, C., Ofterdinger, U., Zhang, S., Ding, A., Li, J. (2016). **Is China fifth largest lake to dry-up?** Incorporated Hydrological and Satellite-based methods in forecasting Hulun Lake water levels. Advances in Water Resources, 94, 185–199.

Chen P, Sleh W and Pai C (2016) **Texting and walking: a controlled field study of crossing behaviours and in attentional blindness in Taiwan.** Behaviour and Information Technology (35).

Chen P, Jou R, Saleh W and Pai C (2016) **Accidents Involving Pedestrians with their Backs to Traffic or Facing Traffic: An Evaluation of Crash Characteristics and Injuries.** Journal of Advanced Transportation.

Cowie, J. (2016, January). **Consumer Sovereignty in the British Passenger Rail Industry.** Paper presented at 48th Annual UTSG Conference, Bristol.

Garcia-Alonso, L., Monios, J., Vallejo-Pinto, J. (2016). **Port competition through hinterland accessibility: the case of Spain.** In: Proceedings of the Annual Conference of the International Association of Maritime Economists.

Girard, J., A., J., Jadraque, J., E., J., Ordonez, J., J., Muneer, J., T., J. (2016). **Spain's energy outlook: A review of PV potential and energy export.** Renewable Energy, 86, 703-715.

McTigue, C., Rye, T., Monios, J. (2016). **The role of reporting mechanisms in transport policy implementation by local authorities in England.** In: Proceedings of the World Conference on Transportation Research.

Monios, J. (2016). **Logistical challenges facing Scottish importers and exporters.** Paper presented at Developing Scotland's International Seaports: Securing Economic Growth, Edinburgh.

Monios, J., Bergqvist, R. (2016). **Intermodal freight terminals: a life cycle governance framework.** London: Ashgate.

Monios, J., Bergqvist, R. (2016). **A Life Cycle Framework for Governance of Intermodal Terminals; Planning, Operations and Strategic Management.** In: Kramberger, T., Potočan, V., Ipavec, V., Chin, A. (Eds.) Strategic Sustainable Logistics and Transportation Planning Strategies. (pp. 24-45). Hershey, PA.: IGI Global.

Monios, J., Wilmsmeier, G. (2016). **Between path dependency and contingency: new challenges for the geography of port system evolution.** Journal of Transport Geography, 51, 247-251.

Monios, J., Notteboom, T., Wilmsmeier, G., Rodrigue, J. (2016). **Competition and complementarity between seaports and hinterlands for locating distribution activities.**

Monios, J., Powell, D. (2016). **Riyadh Freight Handling and Dry Port Options Project.**

Monios, J., Bergqvist, R. (2016). **Vertical integration in the rail sector: using wagons as "relationship specific assets".** International Journal of Logistics Management, 27(2), 533-551.

Rye T. Plevnik A. and Mladenovic L. (2016) **A Comparison of Policy Transfer Processes: Different Sustainable Transport Concepts Transferred to and from Different Countries.** Presented At TRB Annual Meeting, Washington DC, January.

Rye, T. and Llewellyn R. (2016) **Parking enforcement activity and public attitudes to enforcement: a case study of Edinburgh, Scotland (UK) in the context of the EU Push and Pull project.** International workshop on the economics of parking, Barcelona, 28th November.

Svindland, M., Monios, J., Hjelle, H. (2016). **Port choice and the evolution of feeder systems: the case of Norway.** In: Proceedings of the International Association of Maritime Economists (IAME) Conference.

Wang, Y., Cullinane, K.P.B. (2016). **The hierarchical configuration of the container port industry: an application of multiple linkage analysis.** In: Talley, W. (Ed.) Maritime Economics. Routledge.

Wang, Y., Cullinane, K.P.B. (2016). **Determinants of Port Centrality in Maritime Container Transportation.** Transportation Research E: Logistics and Transport Review, (in press).

Wilmsmeier, G., Monios, J. (2016). **Container ports in Latin America - challenges in a changing global economy.** In: Lee, P., Cullinane, K.P.B. (Eds.) Dynamic Shipping and Port Development in the Globalized Economy. (pp. 11-52). Basingstoke: Palgrave Macmillian.

Wilmsmeier, G., Monios, J. (2016). **Institutional structure and agency in the governance of spatial diversification of port system evolution in Latin America.** Journal of Transport Geography, 51, 294-307.

ADVISORY BOARD

We'd like to thank our dedicated Advisory Board members for their continued support throughout the year. Our Advisory Board comprises: Prof George Hazel (Chair), Prof Richard Allsop (Emeritus Professor of Transport Studies at UCL), Alex Macaulay (Partnership Director of SEStran), Dr Kit Mitchell (Emeritus member of TRB and member of CIHT), Martin Richards (Executive Chairman of MVA until his retirement), John Martin (Transport Consultant), Neil Paulley (Visiting Professor at the University of Surrey, retired), Prof Keith Dickinson (Higher Education Consultant & Academic Adviser), Dr Steve Cassidy (Managing Director, Viaqqio Ltd, part of the ESP Group), Neil Johnstone (SYSTRA), Kirsty Lewin (Sustrans UK Board Member) Nazan Kocak (City of Edinburgh Council) and Laurence Kenney (ChargePlace Scotland Programme) .

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We would welcome any feedback on the Annual Report.
If you would like further information on any of the projects
or details contained in this Annual Report, please contact
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Transport Research Institute Annual Report 2016
(Issued May 2017)