

<b>Institution:</b> Lancaster University		
<b>Unit of Assessment:</b> 21, Sociology		
<b>Title:</b> Transforming understandings of mobilities as a catalyst for sustainability, ethical innovation and educational development		
<b>Period when the underpinning research was undertaken:</b> 2006 to 2017		
<b>Details of staff conducting the underpinning research from the submitting unit:</b>		
<b>Name(s):</b>	<b>Role(s) (e.g. job title):</b>	<b>Period(s) employed by submitting HEI:</b>
Monika Büscher	Professor	1996 to present
Nicola Spurling	Senior Lecturer	2014 to present
John Urry	Distinguished Professor	1970 to 2016
James Faulconbridge	Professor	2005 to present
Lynne Pearce	Professor	1990 to present
David Tyfield	Reader	2007 to present
<b>Period when the claimed impact occurred:</b> August 2014 to December 2020		
<b>Is this case study continued from a case study submitted in 2014?</b> N		
<p><b>1. Summary of the impact</b></p> <p>Research by members of the Centre for Mobilities Research (CeMoRe) has revealed how mobilities of people, goods, ideas, capital and diseases shape societies. They have developed ‘the new mobilities paradigm’ (NMP) and mobile methods, which have:</p> <ul style="list-style-type: none"> <li>transformed discourses and frameworks for sustainable mobility innovation in policy, industry, and NGOs in the UK, China and Europe;</li> <li>changed the understanding of the ethical implications of mobility innovation through tools that inform the use, design, and procurement of information technology by emergency organisations, technology developers and ministries in Europe;</li> <li>shaped higher education curricula and public engagement in urban design, tourism, geography and the humanities in key institutions in Europe, Asia, and South America.</li> </ul>		
<p><b>2. Underpinning research</b></p> <p>Through a sustained interdisciplinary programme of theoretical and empirical research, CeMoRe researchers have revealed how societies are caught in socio-cultural mobility systems with complex unintended consequences. This has brought about a new understanding of mobility and new momentum for sustainable and ethical innovation. In their pioneering special issue on the NMP, Sheller and Urry synthesised insights from studies with UK farmers on the mobilities of foot and mouth disease, fat blockages in London sewers, air-travelling executives in Denmark, and more. Their analysis of the complex dynamics of interconnected mobility systems challenged assumptions about mobility. The research was the first to show how urban planning, history and culture, technology, social obligations, amongst other factors, shape individual practices and choices of mobility, which in turn drive diverse planetary crises from climate change to pandemics [R1]. This novel mode of analysis explained how individuals and societies become ‘locked into’ high-carbon lifestyles. Based on this seminal work, CeMoRe researchers have established a diverse body of interdisciplinary research, a selection of which is described below.</p> <p>Büscher and Urry have developed new ‘mobile methods’ to study people, money, viruses, data on the move, e.g. mobile interviews, scenario building [R2]. These new methods paved the way for investigations into everyday mobility practices and global flows which would reveal economic, societal and environmental consequences, and futures. For example, Faulconbridge and his co-authors developed a multidisciplinary analysis of the causes and consequences of corporate air travel [R3]. Their research established the ways that business travel becomes embedded in organisations and their structures, something that creates significant difficulties when reductions in levels of travel are sought for environmental (e.g. carbon dioxide emissions) or social reasons (e.g. gender inequalities and employee wellbeing). Their insights into the social drivers of business travel fed into the <i>Disruption</i> project [G1], and Faulconbridge later became a co-investigator in the ESRC-funded <i>DEMAND</i> Research Centre [G5], and the <i>AirCIF</i> project [G8]. In 2011, Larsen and Urry’s research revealed and mapped how the ‘tourist gaze’ creates inequalities while</p>		

commodifying places [R4]. Urry's work on the application of NMP methods to the social dynamics of high carbon life-styles led to his role as Co-I on the EPSRC-funded *Liveable Cities* project [G3] and in 2014 he and his team were commissioned to write a report for the Government Office for Science's (GOs): 'Living in the City'. The report presented 4 future scenarios of urban sustainability developed from workshops with policy-makers and communities in Birmingham and Manchester. Spurling's work in the *DEMAND* Research Centre extended innovation in mobile methods through interventions in everyday mobility practices [R5]. This work challenged how dominant sustainability innovation often seeks technology or policy 'solutions' and showed how, instead, recrafting resource-intensive practices can reduce mobility demand. Tyfield's studies of low carbon innovation added new insights into China's pivotal role for global sustainable futures [G4], with his research revealing unique systemic challenges missed by mainstream analysis of mobility in China, such as the role of the Internet [R6].

Employing interdisciplinary NMP methods to follow data flows, Büscher has revealed the ethical implications of transformations in privacy, surveillance, and social sorting arising from the mobilisation of data during crisis management [G2, G6]. She has developed a methodology and tools for ethical impact assessment and responsible innovation, leading to research on ethical artificial intelligence in healthcare, practitioner evaluation, and 'societal readiness levels' for innovation in decarbonising transport [R7, G9, G10].

Pearce's inaugural 2014 Mobilities & Humanities colloquium, her publications and *Mobilities, Literature, Culture* book series (Palgrave), and the *Mobile Utopia* project [G7] have pioneered a new sub-field of research. In collaboration with Merriman (a cultural and historical geographer at Aberystwyth University), Pearce edited the first special issue of a journal (*Mobilities* 12.4) to identify and promote Mobility Humanities as a new field of research. The collection show-cased how arts and humanities mobilities research plays a crucial role in revealing mobility as a structuring principle in every aspect of human and non-human life [R8].

### 3. References to the research (citations from Scopus)

- [R1] Sheller, M. & Urry, J. (2006). The New Mobilities Paradigm. *Environment and Planning A*, 38(2), 207-226. DOI:10.1068/a37268 2303 citations. *Peer-reviewed*
- [R2] Büscher, M. & Urry, J. (2009). Mobile Methods and the Empirical. *European Journal of Social Theory*, 12(1), 99-116. DOI:10.1177/1368431008099642 393 citations. *Peer-reviewed*
- [R3] Urry, J. & Larsen, J. (2011). *The Tourist Gaze 3.0*. London: Sage. <https://uk.sagepub.com/en-gb/eur/the-tourist-gaze-30/book234297>. 728 citations
- [R4] Beaverstock, J.; Derudder, B.; Faulconbridge, J., Witlox, F. (2010) (Eds.), *International Business Travel in the Global Economy*, Ashgate. DOI: <https://doi.org/10.4324/9781315589329> 48 citations. *Peer-reviewed*
- [R5] Spurling, N. & McMeekin, A. (2014). Interventions in Practices: Sustainable mobility policies in England. In Y. Strengers & C. Maller (eds), *Social Practices, Interventions and Sustainability: Beyond Behaviour Change*, Routledge. Held at HEI. 32 citations
- [R6] Tyfield, D., Ely, A., & Geall, S. (2015). Low Carbon Innovation in China: From Overlooked Opportunities and Challenges to Transitions in Power Relations and Practices. *Sustainable Development*, 23(4), 206-216. <https://doi.org/10.1002/sd.1588> 30 citations. *Peer-reviewed*
- [R7] Liegl, M., Boden, A., Büscher, M., Oliphant, R., Kerasidou, X. (2016) Designing for ethical innovation: A case study on ELSI co-design. *International Journal of Human Computer Studies*, 95, pp. 80-95. 9 citations <https://doi.org/10.1016/j.ijhcs.2016.04.003>. *Peer-reviewed*
- [R8] Merriman, P. & Pearce, L. (2017). Mobility and the Humanities, *Mobilities*, 12(4), 493-508. DOI: <https://doi.org/10.1080/17450101.2017.1330853> *Peer-reviewed*

### Peer-Reviewed Grants

- [G1] Faulconbridge (PI), *Disruption*, EPSRC/RCUK: (2011 to 2014) GBP1.2 million
- [G2] Büscher (Co-I), *Bridging Emergency Management (BRIDGE)*, EU FP7: (2011 to 2015), EUR13 million
- [G3] Urry (Co-I), *Liveable Cities*, EPSRC: (2012 to 2017) GBP6.3 million

[G4] Urry (PI), Tyfield (Co-I), Low Carbon Innovation in China, ESRC: (2013 to 2017) GBP493,000

[G5] Faulconbridge (Co-I), Spurling (Co-I), DEMAND Research Centre, EPSRC: (2013-2018) GBP3.9 million

[G6] Büscher (Co-I), Secure Dynamic Cloud (SecInCoRe), EU FP7 : (2014 to 2017) EUR4 million

[G7] Pearce (Co-I), Büscher (Co-I), Mobile Utopias 1851-2051, AHRC: (2015) GBP25,000

[G8] Faulconbridge (PI), AirCIF, Danish Innovation Fund: (2017-2021) GBP1.3 million

[G9] Büscher (Co-I), Configuring Ethical AI in Healthcare, Wellcome Trust: (2018 to 2021) GBP76,000

[G10] Büscher (PI), Spurling (Co-I), DecarboN8 Network, EPSRC: (2019 to 2022) GBP1.2 million

#### 4. Details of the impact

##### Transforming policy, industry, and NGO mobility discourse

Urry et al's 2014 'Living in the City' report drew on insights from R1 and R2 and in 2016 became part of the evidence base for the GOfS's *Foresight* programme [S1a]. It shaped the Government's future research priorities, became the resource for national policy-makers in transport and urban planning [S1b,c] and inspired a shift away from car-centred policies towards policies which interconnect 'the fundamentals of living i.e. health, housing, transport' [S1d]. Research by Spurling on mobility practices [R5, G5] contributed to this policy shift and led to her election as a commissioner on the national review organisation Commission on Travel Demand in 2017. Her co-authored 2018 report 'All Change' (2018) inspired the Department for Transport to take "*steps in forecasting and appraisal ...in areas highlighted by the Commission*" [S2a]. The UK's Climate Change Commission drew on this report to recommend reducing support for car travel in their 2018 'Reducing UK emissions: Progress Report to Parliament' report [S2b] and to advocate for changes in technology, society and transport systems in their follow on report in 2019 [S2c].

In 2019, the *DecarboN8* network appointed Büscher and Spurling to lead a cross-cutting theme on Societal Readiness Levels (SRL) [S2, S7, G10]. Since adopting the SRL framework and tools in 2020, network partners have developed a place-based approach and begun to evaluate innovations. The Head of Engagement at the Connected Place Catapult reports that the SRL framework is "*a clear and consistent SRL framework*" and has contributed to the Group's "*strategic objectives to improve regional productivity and facilitate[s] the levelling up agenda*", and "*to determine the readiness of social-technical innovations [and] inspire more responsible, more ambitious and 'joined-up' innovation that is good for society, economy, and environment*" [S3].

In China, Tyfield's work has underpinned briefing reports 'Demand not just Supply', 'Social Innovation' and 'Public Perceptions' [R6, G4], which have been circulated to hundreds of policy makers and stakeholders by Tsinghua University, including contacts in China's Ministry of Science & Technology. It is not possible to directly trace the impact on Chinese policy, but the 13th Five-Year Plan contained a new emphasis on all these areas. Tyfield was also invited to present 4 future urban mobility scenarios to representatives of 40 countries at Shenzhen's 'International Low-Carbon City Conference' in 2016, where he was introduced to a lead analyst at BP. Early consultations with the India-based analyst contributed to BP's eventual realisation of a more diversified mobility strategy, which has translated into the installation of 4 battery swap stations for electric 2 wheel vehicles in 2020, with a further 11 planned in 2021. By 2030, it is planned that 120 million vehicles will be able to access such facilities across India [S4].

NMP methods have changed policy, industry and NGO mobility discourses and frameworks across Europe [R1, R2, R4]. In Spain, strategic tourism policies have benefited: the Head of Barcelona's Strategic Plan for Tourism 2020 described how, after interacting with the research: "*we were able to understand that tourism accommodation was not the only issue at stake, but also overcrowding in public space and how accommodating tourists was contributing to the scarceness of available housing*". He stated that the research had significantly impacted upon their Strategic Plan, prompting "*a cap on the development of*

*new accommodations in the city centre*" and had catalysed work addressing problems of co-existence between tourists and residents [S5]. In Scandinavia, Faulconbridge's work has led Copenhagen Airport and the Danish Business Travellers' Association to switch their business strategies from business travel management to a user-based aeromobilities management framework [R4,G8], providing more systemic traction for industry challenges such as demand for reduced CO<sub>2</sub> emissions [S6a, S6b].

Smarter than Car, an Austrian think tank for future urban mobility (and a partner of the World Urban Campaign) has reframed its campaign for sustainable mobilities in response to Urry's research [R1]. His insights were 'an inspiration' for their 2015 Futurama Redux project, which included an exhibition in 10 countries and at 2 UN conferences [S7a], with estimated audiences of 15 million people. The exhibition's co-ordinator wrote of Urry's enduring impact: *"His voice can be heard in much of Smarter Than Car's work....his insight that each mode of transport reproduces its own system of mobility has had a lasting impact on our work"* [S7b].

### **Shaping understanding of ethical implications for mobility innovation**

Organisations have used research by CeMoRe to understand and address the ethical implications of innovation in IT [R2,R7,G2,G6]. In 2015, the Public Safety Communications European network (PSCE, public safety practitioners), IT developers (e.g., Airbus), small and medium-sized enterprises, and researchers invited Buscher to give a keynote address on mobilities and digital ethics in disasters; her talk increased awareness of the challenges facing innovation in public safety communications amongst the 200+ network members [S8a]. In 2017, the European Committee for Standardisation (CEN) invited Böscher to contribute to the Workshop Agreement on Terminologies in Crisis and Disaster Management, where her ethical innovation approach contributed to changing standards to support interoperability between emergency agencies [S8b]. Böscher was also invited to write the first entry on ethical issues for the European Commission's Disaster Risk Management Knowledge Centre, which translates complex multi-disciplinary research and develops innovative solutions, thus helping the European Commission to bring science-based ethical advice into European disaster risk management policies [S8c].

In 2018, Böscher received GBP75,000 HEIF funding to make her team's methodologies and tools for ethical innovation widely available through the [www.isITethical.org](http://www.isITethical.org) platform. A Professor at Graz University commended the platforms' effects on public healthcare provision, e.g., Austria's Electronic Health Record system and E-Vaccination programme: *"With these additional skills we are much better equipped to tackle larger and more difficult problems (both in a social and in a technical dimension) than before"* [S8d]. Cambridge Medical Academy Ltd. (an SME) stated that Böscher's methodologies were supporting a more effective response to Covid-19 patient overload, *"our exchange has supported a paradigm shift from "effective resource management" to "patient-centred resource management"* [S8e]. In 2018, the PSCE network elected Böscher as Chair of their research committee as they adopted *isITethical* methods to develop a practitioner-led approach to responsible innovation [R7]. At their 2019 conference, the network subsequently voted to include digital ethics amongst their top 10 topics, which subsequently led to Böscher training 20 Bavarian Red Cross incident commanders in ethical innovation methods.

Böscher's approach has enabled deeper dialogue between practitioners and IT developers in the EU, Australia, South Korea, and the USA which has strengthened practitioners' influence and improved the quality of innovation in public safety. The participation of 11 EU Ministries in the EUR9 million BroadWay Pre-Commercial Procurement Project for a pan-EU broadband public safety network as buyers attests to this change. Led by the PSCE network, these Ministries support practitioners in their demand for trustworthy technologies with high social acceptance. In 2019, the global cybersecurity firm Leonardo invited Böscher to lead practitioner evaluation of their submission to BroadWay. Böscher was also invited by BroadWay to help define a practitioner evaluation framework for all three prototypes developed by Leonardo, Airbus and Frequentis [S8a].

### **Influencing Higher Education curricula and public engagement with the research**

Some of CeMoRe's impact across government, industry, and civil society derives from the research's earlier influence upon higher education. The NMP and mobile methods have changed higher education curricula and helped produce more informed, critical, and interdisciplinary graduates in urban design, tourism, geography and the humanities in key institutions in Europe, Asia and South America.



At Aalborg University's Design School (Denmark), a Director of the Centre for Mobilities and Urban Studies (C-MUS) described "*an immense influence on the curriculum*" and the impact of the NMP and Urry's research on the Centre's mobilities design approach [S9a]. In Brazil, an Assistant Professor of Tourism at the University of São Paulo (USP) explained how CeMoRe's work [R1-R3] instigated a 'two-way transfer of ideas', with *The Tourist Gaze* [R3] now being "*fundamental reading within any tourism programme taught at undergraduate level in almost 200 Brazilian universities ... it emphasizes a sociological approach to tourism studies, at a time when few such initiatives were available*" [S9b]. 150 scholars attended USP's Mobilities summer schools in 2017 and 2019 allowing them to share knowledge with invited CeMoRe scholars, and resulting in participants adopted the NMP in addressing mobility justice, ethics, and sustainability issues in Brazil [S9b,c].

Pearce and Merriman's work on mobility and the humanities inspired the founding of two interdisciplinary public research centres. Their finding that narrative and history are pivotal in shaping mobility systems [R8] inspired Padua University to secure EUR6 million from the Italian Ministry for Education in 2018 to found the Centre for Advanced Studies in Mobility and the Humanities. Since establishing this community-centred research centre which focuses on sustainability and landscape, Padua reports that new understandings of the NMP has changed the way "*in which teachers understand and use the notion of landscape ... in their educational practice*" (n=45 in year 1) [S10a]. In 2018, South Korea's Konkuk University secured government funding to establish the Academy of Mobility Humanities in response to (and to further the work of) CeMoRe's work, and to further CeMoRe's work across Asia. Deeply influenced by the research, Konkuk scholars are underway with the translation of Pearce's key text *Mobilities and the Humanities* [R8]. The Academy's civic education programme *Hi-Story 100 Lectures* has engaged over 1,253 citizens with the research thus far (plus over 5,900 online views since March 2019), promoting knowledge of technology, ecology and well-being in the era of high mobility and is 'an important example of the impact of mobilities research outside the academy' [S10b].

## 5. Sources to corroborate the impact

[S1a] Citations within the Government Office for Science's (GOFS) Living in the City report (2014), which was cited in GOFS's 2016 Future of Cities: An Overview of the Evidence; [S1b] GOFS Future of Cities: The Science of Cities and Future Research Priorities (2016); [S1c] GOFS Future of Cities: Foresight for Cities. A Resource for Policy-Makers (2016); [S1d] GOFS Research for Parliament: Preparing for a changing world (Annex B) (2019).

[S2a] Feedback from the Dept for Transport, on the Commission on Travel Demand's report All Change (2019); [S2b] which was cited in the Climate Change Commission (CCC)'s Reducing UK emissions: 2018 Progress Report to Parliament; [S2c] Future of Mobility: a Time of Unprecedented Change in the Transport System (2019).

[S3] Testimonial from the Head of Engagement, Connected Places Catapult (2020).

[S4] Impact statement on results from consultation by a BP Lead Analyst (2021).

[S5] Testimonial from the Head of Barcelona's Strategic Plan for Tourism 2020 (2019).

[S6a] Testimonial from Chief Traffic Forecaster, Copenhagen Airport (2020); [S6b] Letter from the General Manager of the Danish Business Travel Association (2020).

[S7a] Testimonial from Smarter than Car; [S7b] Letter from co-curator of Futurama Redux exhibition (2019).

[S8a] Testimonial from the Public Safety Communications Europe Network (2021); [S8b]

2017 CEN-Workshop Agreement on Terminologies in Crisis and Disaster Management;

[S8c] Sub-Section 5.2.1, 2017 DRMKC report Science for Disaster Risk Management 2017: Knowing better and losing less; [S8d] Testimonial from the Faculty of Mechanical

Engineering and Economic Sciences, Graz University of Technology (2020); [S8e] Letter from the International Education and Innovations Cambridge Medical Academy (2020).

[S9a] Testimonial from Aalborg University (2019); [S9b] Testimonial University of São Paulo (2021); [S9c] Testimonial Rio de Janeiro University (2019).

[S10a] Testimonial from Associate Professor at Padua University (2020); [S10b] Testimonial from Konkuk University (2020).