

Sustainable Mobility

Sustainable Mobility – Editorial Introduction

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Introduction

Sustainable mobility is a relatively new concept in the history of transportation. Its origin has been dated to 1992 and the publication of a European Communities Green Paper on 'The Impact of Transport on the Environment: A Community strategy for "sustainable mobility"' (Commission of the European Communities, 1992; see Holden *et al.*, 2020: 2). As anthropogenic climate change has become a climate emergency (UNEP, n.d.), however, the transition to a sustainable mobility system has taken on great urgency. Transport currently generates about one-quarter of global CO₂ emissions and approximately 14 percent of total greenhouse gas (GHG) emissions (see, *inter alia*, IEA, 2019; Planete Energies, 2019; WRI, 2019). More troublingly, emissions from transport continue to grow, driven in part by both population growth and economic growth.

Looking specifically at the UK, with declining emissions elsewhere in the economy, transport in 2018 (the most recent year for which we have data) was the single largest emitter¹. Despite the first (small) fall in emissions in 2018 since 2013, transport emissions were only 3 percent lower than in 1990. Meanwhile, for the EU28, in 2017, transport emissions (excluding international shipping) were 28 percent above 1990 levels. Aviation saw the largest increase (129 percent), but road transport still dominated transport emissions (71.7 percent), with cars contributing 44.3 percent to total transport emissions (EEA, 2019). Other data suggest that from 1990 to 2016, transport emissions rose by 144 percent in Brazil, 322 percent in India and 794 percent in China (WRI, 2019).

Looking over time, road transport has also contributed 80 percent of the growth in emissions between 1970 and 2010 (WRI, 2019). Aviation and shipping contribute just over 10

percent each, but their emissions also continue to grow. Railways contribute a minimal amount because, globally, they are powered mainly by electricity. The movement of people produces more emissions than freight – about 60 percent of total emissions (Planete Energies, 2019). These figures are, in turn, underpinned by reliance on fossil fuels. Transportation is roughly 95 percent reliant on oil-based fuel which, in turn, represents approximately two-thirds of global oil consumption (Navas-Anguila *et al.*, 2019).

Given the demonstrable failure thus far to redirect the transport sector onto a less environmentally-damaging path, more and more governments are implementing policies to try to address this. The significance of road transport and passenger mobility in the current emissions statistics helps to explain why much attention is being paid to policy measures intended to push the car industry away from petrol- and diesel-powered vehicles, primarily towards electric power. Other efforts include the promotion of non-oil based fuels – for aviation and shipping as well as road transport. Slowly, ambitions for sustainable mobility are also being incorporated into broader sustainability efforts. At the end of 2019, the European Commission published a Communication on 'The European Green Deal' (European Commission, 2019a, 2019b). This recognises the efforts required to decarbonise transport if the goal of a net zero-emission European Union (EU) by 2050 is to be met.

These recent efforts must be seen against the backdrop of one of the most important of all contributions to the climate change debate, the Intergovernmental Panel on Climate Change's 2015 Synthesis Report (IPCC, 2014). This paved the way for the 21st Conference of the Parties (COP 21) in Paris in late 2015, at which countries agreed, albeit only informally, to limit global temperature rises to 2°C above pre-industrial levels, whilst aiming for a limit of 1.5°C. This lower target was agreed in a follow-up report (IPCC, 2018),

1 <https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-to-2018> (last accessed 26 May 2020).

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after several countries at COP 21 feared a 2°C rise was too much in terms of global impacts and therefore called for an assessment of the impacts of and pathways towards limiting the rise to 1.5°C. As a result, recent policy responses such as the EU Green Deal are developing measures aimed at limiting global temperature increases to 1.5°C.

Another way of considering the global effects of anthropogenic climate change is through the rising concentration of GHGs in the atmosphere. Against a pre-industrial level of 280 parts per million (ppm), CO₂ levels in 2016 rose above 400 ppm (and at no point during the year did it fluctuate below that level – for the first time). Recent recordings from Mauna Loa² in Hawaii (which first recorded a figure above 400 ppm only in 2013) show a figure of 417 ppm for May 2020, albeit at a relatively high point in the annual cycle (around a strongly rising trend of approximately 20 ppm per decade). The most recent annual data, for 2018, stand at 407.4 ppm. The last time CO₂ concentration was this high was approximately 3 million years ago.

But why does this matter? Research presented by the IPCC (IPCC, 2018: 101), estimates that in order to achieve the 1.5°C figure by 2100, average CO₂ concentration must remain below 2016 levels (that is to say, below levels we are at already in 2020). To achieve even the 2°C figure, CO₂ levels can only exceed 2016 levels by 5-10 percent. But if we make even the rough calculation of a 2016 figure of 400 ppm, growing at 20 ppm per decade, a ten percent increase will be hit before mid-century. And to restate – it is transport that is generating significant increases in GHGs, even as other economic sectors slow down or even reverse emissions growth.³

Meanwhile, the global responses to Covid-19 have had interesting consequences that offer insights into potential future developments. The loss of economic activity, but also the almost total initial halt to travel, saw emissions fall significantly, with dramatic impacts on air quality, for example. Lockdown disrupted established ways of working, such as travelling to the office each day, or travelling for meetings and conferences. It also disrupted leisure activities, from local trips to foreign holidays in far-off destinations. Covid has also highlighted some of the vulnerabilities of global just-in-time supply chains. Questions abound as to what comes next, notably around whether we simply look to return to the ‘old normal’; and if not, what might the ‘new normal’ look like? In particular, what could and should mobility look like as governments globally start to plan for post-Covid economic recovery?

2 <https://www.esrl.noaa.gov/gmd/ccgg/trends/mlo.html> (last accessed 11 June 2020).

3 Research being prepared for the next IPCC assessment scheduled to be published in 2021, suggests that climate sensitivity to CO₂ emissions is higher than previously thought, which would make this outlook optimistic. See: <https://www.theguardian.com/environment/2020/jun/13/climate-worst-case-scenarios-clouds-scientists-global-heating> (last accessed 14 June 2020).

With great environmental challenges and major policy initiatives, 2020 is therefore a very exciting time to be launching a new journal. Below, we first reflect on what is meant by three of the key terms in these debates – sustainable development, sustainability, and sustainable mobility. We then elaborate further on our vision for *Sustainable Mobility*, not just as an academic journal, but as a forum for debate between academics and a wide range of other stakeholders as we pursue mobility that is more sustainable.

Sustainable Development, Sustainability and Sustainable Mobility

Any understanding of the evolution of thinking on sustainable development involves, almost inevitably, reference to The Brundtland Report (WCED, 1987), which then formed the basis of discussion at the Rio Earth Summit in 1992. This United Nations (UN) report defined sustainable development as development that ‘meets the needs of the present without compromising the ability of future generations to meet their own needs’ (WCED, 1987: 24 [paragraph 27]). The Brundtland Report, in that same paragraph, elaborates on what is possible:

The concept of sustainable development does imply limits – not absolute limits but limitations imposed by the present state of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities. But technology and social organization can be both managed and improved to make way for a new era of economic growth.

In other words, develop new technologies and change how we organise society and growth can continue as it had in the past. The Brundtland Report also observed that in 1985, an international scientific meeting had ‘concluded that climate change must be considered a “plausible and serious probability”.’ (WCED, 1987: 177 [paragraph 20]). One of the bodies organising that 1985 meeting, the United Nations Environment Programme (UNEP), now promotes the idea of a climate emergency (UNEP, n.d.). Reflecting on the socio-technical optimism of Gro Harlem Brundtland and her co-authors from this distance, fundamental questions arise as to whether their understanding of sustainable development now holds.

Do absolute limits exist, notably on ‘the ability of the biosphere to absorb the effects of human activities’? Do discussions around limiting temperature rises to 1.5°C or 2°C indicate an absolute limit, or that scientific discussion is focusing only on the relative and plausible, if still challenging? Have economic developments unimagined in the 1980s, such as the economic growth witnessed in the Global South, altered fundamentally the relationships embedded in The

Brundtland Report definition? Socio-technical developments were seen as the way of enabling new economic growth. Enormous economic gains have been achieved, notably the reduction of extreme poverty from 36 percent of the world's population in 1990, to 10 percent in 2015 (UN, 2020). That said, growing economic activity has resulted in growing emissions, increasing incomes have increased demand for personal mobility (especially cars), and both have increased international trade – and its associated emissions – all moving ahead of the potential neutralising effects of technological development and social reorganisation. Growth, therefore, has helped to create sustainability challenges, rather than be enabled to avoid sustainability challenges.

Agreement on The Brundtland Report at the UN (1987), the Rio Earth Summit (1992) and the subsequent Kyoto Protocol (1997) represent ten years of intergovernmental discussion on sustainable development. A key development coming out of the academic business literature emerged when John Elkington (1994) wrote about business strategies for sustainable development, introducing the world to the triple bottom line (TBL). He writes of businesses developing win-win-win strategies that benefit themselves, their customers and the environment, although the TBL is usually framed as 'a sustainability framework that examines a company's social, environment, and economic impact' (Elkington, 2018). That said, in the latter publication⁴, Elkington makes it clear that his idea was conceived with a much broader scope than it has typically had attributed to it subsequently. Ironically perhaps, given its proliferation as a business management and accounting tool, it was originally meant to frame debate that questioned the very nature of capitalism:

[T]he original idea was wider still, encouraging businesses to track and manage *economic* (not just financial), social, and environmental value added — or destroyed. This idea infused platforms like the Global Reporting Initiative (GRI) and Dow Jones Sustainability Indexes (DJSI), influencing corporate accounting, stakeholder engagement and, increasingly, strategy. But the TBL wasn't designed to be just an accounting tool. It was supposed to provoke deeper thinking about capitalism and its future, but many early adopters understood the concept as a balancing act, adopting a trade-off mentality.

Thus, as with sustainable development, The Brundtland Report, the Rio Earth Summit, Kyoto Protocol, through to the 2015 Paris Climate Agreement, with the TBL as well there appears to be a lot of work still needed to deliver fully on the original ambition of the concept.

As a major source of emissions growth, the transport sector should be central to responses around sustainable development. That said, the UN 17 Sustainable Development

Goals (SDGs) fail almost totally to address transport and mobility. SDG 3, good health and well-being, seeks to reduce deaths from road traffic accidents, without mentioning the number of vehicles on the road. SDG 7, affordable and clean energy, includes promoting the shift to a substantial increase in the share of energy generated from renewable sources. This is essential if the electrification of transport is to maximise its contribution to decarbonisation, but again transportation is not mentioned. SDG 9, industry, innovation and infrastructure, includes in its targets reference to sustainable infrastructure, and to industrial and technological upgrading and development that could include transportation. SDG 12, responsible consumption and production, refers in its targets to rationalising fossil-fuel subsidies, and to transnational companies operating in a more sustainable way. It is only SDG 11, sustainable cities and communities that, in one of its targets, refers explicitly to either transport or mobility⁵:

11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons

Even this represents only limited consideration of transport-related sustainability. As noted already, 40 percent of emissions comes from the movement of freight. Further, a major source of emissions growth in developing and emerging countries is the growing demand for private cars (*inter alia*, Gan *et al.*, 2019). Inter-city and international mobility of people and freight is notable here by its absence from this SDG.

There is no single, widely accepted, definition for sustainable mobility (Holden *et al.*, 2020). One definition, modelled on the Brundtland Report's definition of sustainable development, comes from Zhang and Yazdani (2014: 15): 'people's ability to access economic and social opportunities while minimizing the environmental impact of their movement and activities.' This, however, also implies a focus on car-based private mobility. The body 'Sustainable Mobility for All' (SuM4All), established in 2017, has created a mission statement for a global mobility system built around four dimensions: universal access, efficiency, safety, and greenness. Once again, however, the details behind the stated 'ambition' of SuM4All say little about mobility other than for individuals.

Changing the terminology slightly, the EUs European Green Deal (European Commission, 2019a: 10) refers to sustainable transport as 'putting users first and providing them with more affordable, accessible, healthier and cleaner alternatives to their current mobility habits' but this, like SDG 11 and the foregoing definition of sustainable mobility, fails

⁴ This is an online blog that has no page numbers.

⁵ <https://sustainabledevelopment.un.org/?menu=1300> (last accessed 2 June 2020).

to capture the breadth of challenges faced in enhancing the sustainability of the transport system. A different definition for sustainable transport that has gained more traction, comes from a 2001 meeting of the European Communities' Council of Ministers for Transport and Telecommunications⁶:

A sustainable transport system [is] defined as one that:

- allows the basic access and development needs of individuals, companies and societies to be met safely and in a manner consistent with human and ecosystem health, and promotes equity within and between successive generations;
- is affordable, operates fairly and efficiently, offers choice of transport mode, and supports a competitive economy, as well as balanced regional development;
- limits emissions and waste within the planet's ability to absorb them, uses renewable resources at or below their rates of generation, and, uses nonrenewable resources at or below the rates of development of renewable substitutes while minimising the impact on the use of land and the generation of noise.

From all of the foregoing, we offer this definition of sustainable mobility:

Access to the means of mobility by all individuals, companies and societies, ensuring the safe movement of people and goods, minimising the environmental impact of this movement, without compromising the ability of future generations to meet their own mobility needs

Naturally, any concise definition of a complex and multidimensional concept needs to be accompanied by a further elaboration of the practical implications of the definition. That, concisely, is the purpose of *Sustainable Mobility*. We seek to provide a forum that encourages research and debate around the empirical and practical, but which rises out of different theoretically-grounded social science approaches to the many aspects of sustainable mobility.

Our ambition for research on sustainable mobility

The aim of *Sustainable Mobility* is to be a forum that provides space for publication, dissemination and debate across the full range of modes of mobility, from local active mobility (walking and cycling) to trans-global flying and shipping. To enable the widest possible discussion, *Sustainable Mobility* has obtained initial funding to enable it to be published as a Gold Open Access journal. To maximise potential engagement with our

publications and flexibility for our authors, we have adopted a CC-BY 4.0 license for this. In order to enable publication in as timely a manner as possible, we have adopted a 'continuous publication' model. In contrast to 'Early View' models, the final formatted and paginated Version of Record is published immediately. Each article will be attributed to a 'Volume', based on the year of publication, but there will be no 'Part' numbers.

We welcome submissions from across the social sciences, broadly defined – and beyond, if a social dimension is presented. We have put together an impressive Editorial Board, bringing together leading experts in sustainable mobility. Each brings a particular specialism, in terms of discipline and/or transport mode. We have chosen deliberately to operate with a small group of experts, as a sign of our intent to have our editorial team play an active role in the running, leadership and development of the journal.

Supporting the Editorial Board, we have been very fortunate to bring together a truly impressive Editorial Advisory Board. The Editorial Advisory Board brings together individuals with considerable professional expertise and experience from a range of stakeholder companies and organisations with interest in sustainable mobility. We intend *Sustainable Mobility* to be at the cutting edge of policy and professional debate, providing a forum where academics can engage with individuals from the public, private and third sectors.

In order to promote high quality research, interaction and debate, *Sustainable Mobility* will publish four distinct types of paper: original articles, policy perspectives, case studies and book reviews. Original articles are the principal format for the publication of academic research. The research must be theoretically robust, but we are particularly interested in empirical studies that are of interest to a wide readership.

Policy perspectives, by contrast, are short articles that aim to promote dialogue between all interested in sustainable mobility. They should be written in a style that avoids technical and scientific jargon as far as is reasonable. Academics can publish research in this format, where the key findings and the implications of findings for policy, practice and society are central. We welcome in particular policy perspectives written by stakeholders from outside of the academic community, in order to bring new insights and to stimulate debate. Further, we welcome contributions in the policy perspectives format which present academic and/or practitioner insights into current policy documents, events or announcements. We shall actively commission such contributions, but will also welcome proposals for such contributions from any potential author.

Third, we shall publish case studies. These can provide insights capable of informing policy and practice in a clear and concise way. Case studies are also an established resource in social science teaching. As we educate future leaders in sustainable mobility then case studies, informed by rigorous

⁶ This definition is contained in the minutes of the meeting, available at: <http://corporate.skynet.be/sustainablefreight/trans-council-conclusion-05-04-01.htm>. It was itself derived from a Canadian study of 1997 (see CST, 2005: 6, for more information).

academic research and/or insights from practitioners, will ensure students remain at the forefront of developments in sustainable mobility.

Fourth, there are book reviews. These will help to guide our readership around the latest long-form publications in the field of sustainable mobility.

Our coverage is intended to be guided by, but not limited by, our definition of sustainable mobility. Our coverage embraces people and freight. Transport modes include, but are not limited to, road, air, shipping, rail and active mobility/active travel (walking and cycling. See, e.g., Biehl *et al.*, 2019; Kahlmeier *et al.*, 2020). Road transport includes privately-owned cars, public transport and mobility-as-a-service (MaaS) for the movement of people, and vans and trucks for the movement of goods. Active mobility has a local focus, especially in urban settings, as the flip-side to removing polluting personal mobility, for which we see governments already promoting active mobility in response to Covid-19, nationally (such as in the UK⁷) and in major cities⁸.

Empirical analyses can address global issues, all the way down to very localised challenges from and responses to mobility and the climate emergency. Even though research with a local focus will be geographically-specific, lessons can be shared and learned. We have no barriers to the country or region of analytical focus – the sustainable mobility challenge is global, but responses are needed not only at the global level, but also locally, where bespoke responses can be designed to address specific challenges.

Sustainable Mobility is designed as a journal for the social sciences, but we define this broadly and inclusively. Following Lawson (2003), we suggest the notion of social science, singular, as a way of conceiving of the academic focus of *Sustainable Mobility*, with different academically defined disciplines offering distinct, but complementary, contributions to our understanding of social phenomena as they relate to mobility. Indeed, we welcome both multi-disciplinary and inter-disciplinary research on sustainable mobility. We also invite research from other disciplines where individuals, companies and/or societies are the focus of the research, either as the unit of analysis or as the intended recipient or beneficiary of the research.

Concluding Thoughts

Climate change is the archetypal super wicked problem (Lazarus, 2009; Levin *et al.*, 2012). This means that time is running out; those seeking to end the problem are also causing it; there is no central authority to oversee and drive responses;

and policies, not only many individuals, frequently discount the future irrationally (Levin *et al.*, 2012: 127-128). The scientific consensus is clear that dramatic changes are needed to what we do and how we do it – and this is especially the case regarding the mobility of people and goods. The experiences of Covid-19 indicate that when faced with immediate crisis, governments can take drastic action. Scientists are working to respond with effective vaccines in a fraction of the time new treatments normally take to bring to market. Citizens across the world have responded well to policies restricting their usual freedoms. The personal tragedies and economic damage are enormous, but recovery will come. The challenges with the climate emergency and the required changes to mobility, however, are several orders of magnitude greater. The evidence also points towards longer lead-times from action to impact, given the scale of the challenges faced and responses required. Being in a state of climate emergency already, we need action. Through the research published in *Sustainable Mobility*, and the contribution to debate that we aim to stimulate, we hope to make a small contribution to addressing the challenges faced in moving to a system of sustainable mobility.

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