

GOVERNANCE OF THE SMART MOBILITY TRANSITION

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CHAPTER 1

INTRODUCTION

Greg Marsden and Louise Reardon

ABSTRACT

Despite the massive social benefits that the car has brought, it has become evident that the current mobility system is undermining the benefits it creates with substantial air quality problems, inactive lifestyles, deaths and injuries from accidents and major contributions to the global climate change challenge. The introduction of smart mobility innovations, in promising to challenge the existing regime of automobility may be a major policy opportunity, and also provide a source of new economic opportunity. However, it is far from clear that these opportunities will be recognized or, even where they are, realized due to the complexities of steering any transition in the mobility system.

This book sets out how we should understand the challenge of governing the smart mobility transition and, in this introductory chapter we set out the key arguments and contributions of each part of the book for addressing these challenges. The first section of the book focuses on how the role of the government is challenged by the growing network of actors and the new resource interdependencies that emerge from smart mobility. How these challenges come to be recognized and resolved is itself a critical part of the governance process as

explored in the second section. The third section examines the changing context of governance and the capacity of the state to act to steer the transition. This allows us to identify, in our final concluding section, a set of critical topics for those researching and implementing the smart mobility revolution.

Keywords: Governance; smart mobility; institutions; meta-governance

WHAT IS SMART MOBILITY?

This book is about the governance of smart mobility. However, it is necessary to ask what smart mobility is before we can describe why it might be different or interesting to think about the governance of it. Is it actually anything new? Transport systems are always evolving and each generation can be seen to be imbued with more technology and therefore in some ways ‘smarter’ than what went before. For example, the introduction of the first traffic signal outside the Houses of Parliament in England in 1868 was the start of a new wave of rules, regulations and technologies which shape how traffic is managed in cities today. Smart mobility is therefore perhaps more a label with currency than anything specific. However, the label has prevalence perhaps because we are in a period where a series of innovations are being brought forward which separately and (potentially) in unison are promising to significantly change how people move around. Some would argue that they have already done this. To date, smart mobility innovations include:

- The ability and need to electrify the vehicle fleet using battery power, plug-in hybrid and/or other new technologies (Dijk, Orsato, & Kemp, 2013);
- Almost ubiquitous mobile Internet, mapping technologies and related ‘apps’ available in portable smartphone devices allowing two-way flows of data and information, integrating mobility and non-mobility options (see Toole et al., 2015);
- Increasingly autonomous vehicles that initially support but may subsequently remove the driver from even a supervisory role in the vehicle,

allowing occupants to do other tasks on the move (see [Fagnant & Kockelman, 2015](#));

- A shift towards models of ‘usership’ rather than ‘ownership’ of vehicles with an evolution from organized car-sharing schemes through real-time ride-hailing apps, to more integrated products referred to as ‘Mobility as a Service (MaaS)’ ([Jittrapirom, Caiati, Feneri et al., 2017](#)) and
- Increasingly intelligent infrastructure which is capable of not only interacting with users and vehicles in real-time to adapt its service but also potentially change user behaviour through price signals, information or other incentives ([Alam, Ferreira, & Fonseca, 2016](#)).

We also note that these innovations are occurring as part of a much broader transition of large aspects of society: for example, major changes to retail with the rapid growth of Internet shopping ([Ginsberg & Uygur, 2017](#)) and changes to healthcare technologies and provision ([Bauchner, Berwick, & Fontanarosa, 2016](#)). All of these will, in turn, impact on what we travel for and how and where we access goods and services.

While it is possible and often necessary to focus down on the specifics of a given technology, from the perspective of this book we are interested in how these technologies are introduced and what changes as a result. To understand this, it is necessary to think about the technologies as part of a broader socio-technical system of mobility. [Rotmans, Kemp, and van Asselt \(2001, p. 16\)](#) identify such systems as having a ‘set of connected changes, which reinforce each other but take place in several different areas, such as technology, the economy, institutions, behaviour, culture, ecology and belief systems’. In the last 50 years of the previous century, most clearly in developed countries, the mobility system has arguably become a system dominated by the car, creating what [Urry \(2004\)](#) describes as a self-reinforcing system of automobility.

Despite the massive social benefits that the car has brought, it has become evident that the current system is undermining the benefits it creates with substantial air quality problems, inactive lifestyles, deaths and injuries from accidents and major contributions to the global climate change challenge. For these reasons, transitions and mobility scholars have argued that the current system needs to be transformed towards

a smarter and more sustainable one (Geels, Kemp, Dudley, & Lyons, 2012). The introduction of smart mobility innovations that can challenge the existing regime of automobility is therefore both a source of new economic opportunity (for some) and a major policy opportunity (if recognized as such).

At this early stage of smart innovation there are signs of positive changes, such as a shift away from car ownership towards more active modes, and greater use of public transport and ride-sharing services, particularly in the centres of major cities (e.g., Le Vine & Polak, 2017; Rabbitt & Ghosh, 2016). There are also impressive policy visions of transport systems where, decades from now, the completed transition to smart mobility has enabled circumstances in which there is no congestion on our streets and the ability to hand back urban spaces for parkland and social interaction is plentiful (ITF, 2017). However other, more challenging, outcomes are also possible. Increased automation could, for example, promote a much more individualized and personalized mobility system where there is significantly more traffic (Wadud, Mackenzie, & Leiby, 2016) and where such innovations further cement the longevity of automobility (Schwanen, 2016). For the most positive and optimistic visions to come about would require multiple innovations to succeed and a level of collaboration and cooperation which has hitherto not been a feature of transport markets which have tended instead to produce bespoke and poorly integrated transport systems. The behaviour of some of the early innovators in the system also suggests the potential to produce negative externalities, possibly even undermining rather than enhancing sustainable transport aims (Kitchin, 2015).

While there is inevitably uncertainty about the scale, pace and nature of the development of smart mobility, we start from the position that some and perhaps many of these innovations will prevail. Others may remain as niche innovations or disappear altogether. Others will surely emerge. The move to a system characterized by more 'smart mobility' is inevitable. What is less clear is how it will happen and how differently it will happen in different places. This we suggest is contingent on how state and non-state actors interact to shape the future transition or, in short, how smart mobility is governed. We now turn our attention to what we mean by governance.

GOVERNANCE

Fundamental to the concept of governance is its analytical separation from the notion of government. As *Stoker (1998, p. 17)* notes, government refers to ‘the formal institutions of the state and their monopoly of legitimate coercive power’ and in particular ‘the formal and institutional processes which operate at the level of the nation state to maintain public order and facilitate collective action’. In contrast, ‘the essence of governance is its focus on governing mechanisms which do not rest on recourse to the authority and sanctions of government’ (*Stoker, 1998, p. 17*). In turn, governance ‘evokes a world in which state power is dispersed among a vast array of spatially and functionally distinct networks composed of all kinds of public, voluntary, and private organizations with which the centre now interacts’ (*Rhodes, 2011, p. 34*).

Rhodes (1996, 2007) identifies four underpinning characteristics of governance. The first is the growing interdependence of organizations. The delegation of state authority to autonomous agencies, and the outsourcing of delivery of public services to private companies, for example, has meant the boundaries between state, private and voluntary sector organizations have ‘shifted’ and grown ‘opaque’ (*Rhodes, 1996, p. 660*). The second characteristic is the sustained interaction of members of networks due to their dependence on one another for resources (such as finance, information and legal authority), which mean they must negotiate shared goals. The third characteristic is ‘game-like interactions’ that are rooted in trust and regulated by ‘rules of the game’ that are negotiated through shared purposes. The fourth characteristic is ‘a significant degree or autonomy from the state’. *Rhodes (1996)* argues that because networks are ‘self-organizing’ they are not accountable to the state, and therefore the role of the state is to ‘directly and imperfectly steer networks’. This notion of ‘steering’ lays in contrast to ‘rowing’ in which the state provides and delivers policies and services itself (*Osborne & Gaebler, 1992*).

However, these characteristics of governance do not suggest in and of themselves that the outputs of governance should, or need to be, different from those of government. As *Stoker (1998, p. 17)* argues, ‘governance is ultimately concerned with creating the conditions for ordered rule and collective action’, and therefore the difference between government and governance is the process by which the outputs are achieved (*Rosenau, 1992; Stoker, 1998, p. 17*). As a consequence, many definitions of governance

stress the provision of rules, laws and guidelines to determine action. For example, Kjaer (2004, p. 10) sees governance as ‘the setting of rules, the application of rules, and the enforcement of rules’, while Donahue (2002, p. 1) understands governance as ‘the rules and institutions for the authoritative organization of collective life’. The extent to which government (or ‘the state’) has the power to set, apply and enforce these rules and how it does so is contested. This process of the ‘governance of governance’ is understood as ‘meta-governance’. The literature points to the importance of framing, story-telling, support and facilitation of networks as important tools for meta-governance over and above more traditional hierarchical, top-down mechanisms (Sørensen, 2006; Torfing, Peters, Pierre, & Sørensen, 2012).

SMART MOBILITY AND GOVERNANCE

This book was assembled from papers presented at a meeting of the World Conference on Transport Research Society Special Interest Group on Governance and Decision-Making, hosted as part of the International Transport Forum Summit on Governance in May 2017. We introduce the structure of the book and the contents of each chapter by drawing together the brief introductory literature reviews on smart mobility and governance and presenting some key themes.

The first section of the book, *Navigating the Role of the State*, explores the extent to which smart mobility might change and challenge the position of the state within the transport system. It is clear that smart mobility is bringing a new set of actors to the transport arena. These actors include global technology companies such as Google and Apple; (transport) service aggregators such as Uber and Lyft; and firms specializing in artificial intelligence, automation and robotics who are working with incumbent providers to change the nature of existing goods and services (for example, BMW’s partnership with Mobileye). This expanded and increasingly complicated multi-level network of actors has the potential to change the nature of the state’s role as a provider of services (‘rowing’ within the transport system), but also challenges its existing relationships and position in transport governance networks more broadly. For example, in 2004 the UK Government established a pioneering journey planning portal for the United Kingdom (Transport Direct), providing the information necessary to

enable multi-modal journey planning. The portal closed in 2014 with the Government reporting that ‘equivalent travel information services are now widely available online from several other sources’ (DfT, 2014), marking a movement of the state away from information provision.

The business models of smart mobility companies are predicated on challenging incumbent providers in order to give consumers something new and ‘better’, which is why smart mobility innovations are often referred to as ‘disruptive’. Subsequently, we are seeing well-established state–provider relationships being resisted, redefined and sometimes renegotiated (Dudley, Schwanen, & Baniste, 2017). For example, Uber has popular and successful operations in over 675 cities around the globe, but yet has faced wide-spread protests from incumbent operators (e.g., in London and Paris), is banned from some countries (e.g., Italy and Bulgaria) and has withdrawn operations or had its license revoked in other cities where they have refused to comply with regulations which apply to incumbent taxi and private hire companies (e.g., Copenhagen and Austin, Texas). This section of the book, therefore, begs questions of how the state should behave in these circumstances, reflects on whether there are areas where the state should change its role (such as in the Transport Direct example), and how and whether the state should justify interventions to limit the behaviour of firms such as Uber when so many people sign up and use them.

The first chapter in this section, by Iain Docherty, sets out the wider arguments for the key and unique role the state must play in the mobility system and asks to what extent these arguments are diminished as a result of new ‘smart’ innovations, or simply in need of revision and recalibration. Drawing reference to the wholly optimistic visions of the potential of the automobile from the 1950s, Docherty suggests that while smart mobility innovations might promise to deliver significant societal benefits for all, there also exist pathways which take us further away from sustainability. It is also necessary, he argues, to understand that just as existing private-sector transport operators provide uneven services both geographically and temporally due to their focus on profitable markets, so too will new mobility providers. Docherty argues therefore that the state’s task is to develop and adapt in ways which continue to allow it to both set the overarching direction of policy and have a sufficient hand on the tiller to steer towards positive social outcomes, part of which will include continuing to

play an important role as guarantor of a certain level of socially necessary or desirable services.

The following chapter by Kate Pangbourne, Dominic Stead, Milos Mladenovic and Dimitris Milakis drills down further into these issues through the case of MaaS. The authors introduce the importance of framing as an aspect of state involvement. While there are in fact many different forms of MaaS, it is commonly assumed to be an innovation which reduces car ownership and unsustainable travel. However, as the authors point out, the business models are predicated on making travel cheaper and easier and on selling more, not less, mobility. Before jumping on MaaS as a solution therefore, they suggest much greater clarity is given to the ways in which MaaS might be supported or regulated to ensure the systems contribute sufficiently in the long run to the public good and provide adequate consumer protection.

The second section of the book asks, '*Whose Voices Are in the Smart Mobility Debate?*' As Rhodes argues, continuing interaction between members of the governance network is one of the ways in which shared goals can be reached. However, there exist asymmetries of power within networks; not all members are equally reliant on the resources of others to achieve their goals, and therefore not all voices receive equal attention. The question of who gets to participate is, therefore, critical to understanding how agendas surrounding smart mobility, its implementation and outcomes will emerge. It is important here to state that, while each of the chapters in this section critically reflects on different aspects of the changing voices in the mobility debate, the direction of travel should not necessarily be inferred as negative. After all, the outcomes of the current [auto] mobility system do not work for everyone and privilege some communities of actors while marginalizing others (Bickerstaff & Walker, 2005). Smart mobility may provide opportunities to resolve, or mitigate, some of these issues.

Chapter 4, by Robyn Dowling, exposes the importance of issue framing for determining how networks are accessed and shaped. Through a case study approach, she demonstrates that the legally defined or socially accepted categories of what transportation services are (e.g., what delineates 'public transport') defines the extent to which innovations fit or disrupt existing governance systems. The state can easily categorize some innovations, such as car sharing, and in turn adapt existing tools and

practices to allow these new uses to emerge and flourish. Other innovations, such as driverless cars, services such as Uber, and new products such as Segways, are harder to categorize as they have no precedent. It is therefore a struggle for new innovators to make their way into the system, and so they adopt a strategy of framing themselves in a way that may sometimes obscure their intended purpose or potential. Who has the power to set, shape or resist these categorizations is a crucial and understudied part of the smart mobility governance story.

Chapter 5, by Debbie Hopkins and Tim Schwanen, challenges the premise that smart mobility transitions can be developed effectively through existing, market-orientated governance approaches, which exemplify a 'post-political' narrative of transport provision in which the market will provide the necessary solutions. Drawing on the case of vehicle automation, they point to the very uncertain nature of technological developments and societal acceptance of such developments as requiring a more reflexive and participatory style of governance, as recognized in the Transitions Management literature. They argue that successful implementation will need to occur through experimentation and social participation as well as through user, provider and governmental learning within and across networks, and therefore requires a governance environment in which the state and those that experience smart innovations continue to actively shape the systems they need.

Chapter 6, by Edgar Salas Gironés and Darja Vrščaj, takes a case study approach to ask *Who Benefits from Smart Mobility Policies?* Analysing two schemes designed to reduce congestion through the acceleration of e-bike adoption, their chapter looks at the important question of how new innovations are framed and the effect of these framings on different groups. Drawing on frameworks from the Social Construction of Policy Design and Science and Technology Studies, they identify that the benefits of the scheme are aligned to those who currently commute to work by car, while students and those who already take non-car-based modes to work are marginalized. These findings are representative of a more general challenge to accelerating the adoption of many new innovations, which is that they tend to focus on the wealthier early adopters. This does not have to be the case for smart mobility, but again serves as a reminder of the conscious and unconscious biases in planning where problems are solved for

‘people like us’ (Ralph & Delbosc, 2017), and which therefore marginalizes other groups with different and sometimes greater need.

The third section of the book focuses on *State Capacity*, or the ability of the state to exercise its power within a network of actors in order to ‘set the rules of the game’ and steer policies towards chosen outcomes. Here, we draw on Pollitt’s (2008) reminder that time is an understudied facet of political science and implementation studies, and plays a role in determining the ebbs and flows of power and where it resides. For example, the smart mobility transition has developed during a period of significant fiscal re-adjustment following the global financial crisis of 2008. The fiscal re-adjustment has led to widespread and substantial reductions in government expenditure, for example, local governments in England have experienced a real terms cut in revenue of 36.3% between 2009–2010 and 2014–2015 (IFS, 2015, p. 1). As Gardner (2017, p. 158) notes, such pressures have led to ‘market-driven approaches to co-ordination...growing in importance in comparison to state-driven models’, for example, ‘the exploration of outsourcing in relation to specific functions...’. However, while the financial crash may have increased the urgency with which such changes are being implemented, they are not new and are part of a longer process of trends towards New Public Management in the context of political projects which stress the efficiency that can be gleaned from a ‘small-state’ and ever-greater delegation of tasks to the private sector and other non-state providers (Bovaird & Loeffler, 2016; Hood, 1991). It is within this context then that we have to understand where within government there is the capacity to steer the mobility transition and what factors contribute to building rather than eroding that capacity.

Chapter 7, by Diane E. Davis, explores how two different smart mobility innovations came to be implemented in the way they were and what this has meant for the development or diminution of state capacity. In so doing, Davis points to the need to pay attention to styles of governance and to the role of policies as a tool of governance. In the case of the introduction of Uber in San Francisco, where there was no incumbent policy framework applicable to Uber, the local government initially sought to block its activities and was outflanked at a state level where the power of opposition was weaker and the economic influence of technology companies felt more strongly. The legacy is weaker local government control over mobility, and little development of capacity at the State level.

By contrast in Stockholm, congestion charging was driven by the state, albeit through a challenging political process. Here though, the policy was state-driven and brought in private-sector ‘smart’ expertise to improve the scheme’s delivery and reputation of the city, which facilitated trust between the state, smart mobility operator and users, enabling further innovations to be implemented.

Chapter 8, by John Stone, David Ashmore, Jan Scheurer, Crystal Legacy and Carey Curtis, explores some of these themes through a different setting. The Australian case warns of the long-term impacts of neo-liberal, market-driven transport provision and a subsequent closing off of mind-sets to the potential for delivering innovations through collective, state-led, effort. The on-going development of privately financed road infrastructure investment is symptomatic, they argue, of a ‘hands-off’ mentality that might limit the extent to which the state would wish to (or be seen to) influence the roll out of technologies such as autonomous vehicles. Through interviews with public sector officials, the authors demonstrate that there is a very low level of strategic thought and capacity going in to planning for a smart mobility transition despite an awareness that it matters to their existing portfolio of operations and practices. The authors describe an ‘existential crisis of legitimacy and purpose’ for the state which will be a major challenge to any notion of intentional steering of a transition.

Chapter 9, by Greg Marsden and Louise Reardon, explores the importance of the type of role the state takes in steering the smart transition through a scenario exercise conducted with experts from nine different countries. The scenario exercise was set up to understand which smart mobility innovations would ‘flourish’ or ‘falter’ in a two-dimensional scenario space. The dimensions chosen were a more directive and ‘hands-on’ governance at one end of the axis to a more laissez-faire ‘hands-off’ style at the other, and high social acceptance of innovation through to low social acceptance on the other axis. The experts were able to identify different cities or countries as being more aligned with some of these scenario spaces today. It was felt that only in the hands-on, social acceptance space would a fully integrated and multi-modal system of smart mobility emerge. In other spaces some innovations were seen to be attractive and likely to be deployed but, in general, on a more individualistic mobility model. The exercise points to a key argument in the book, which is that the role of

government within a broadening network of governance matters significantly to the sort of smart mobility transition that will be delivered.

Chapter 10, by Louise Reardon and Greg Marsden, draws the key themes of the book together, focusing on why it is necessary and what it will take for the state to engage with, steer and build capacity as part of the expanding governance networks of the smart mobility world we are moving towards. It does so through further reflection on the eight contributory chapters. We argue that, although early days in the transition, it is necessary to start considering now what thinking and adaptation is necessary to get the best out of the technologies being developed. It is though still the start of that journey and we hope this book provides the start of many further critical debates to advance the study of the governance of smart mobility.

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