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The governance of smart mobility

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ABSTRACT

There is an active contemporary debate about how emerging technologies such as automated vehicles, peer-to-peer sharing applications and the 'internet of things' will revolutionise individual and collective mobility. Indeed, it is argued that the so-called 'Smart Mobility' transition, in which these technologies combine to transform how the mobility system is organised and operates, has already begun. As with any socio-technical transition there are critical questions to be posed in terms of how the transition is managed, and how both the benefits and any negative externalities of change will be governed.

This paper deploys the notion of ensuring and enhancing public value as a key governance aim for the transition. It sets out modes and methods of governance that could be deployed to steer the transition and, through four thematic cases explores how current mobility governance challenges will change. In particular, changing networks of actors, resources and power, new logics of consumption, and shifts in how mobility is regulated, priced and taxed – will require to be successfully negotiated if public value is to be captured from the transition. This is a critical time for such questions to be raised because technological change is clearly outpacing the capacity of systems and structures of governance to respond to the challenges already apparent. A failure to address both the short and longer-term governance issues risks locking the mobility system into transition paths which exacerbate rather than ameliorate the wider social and environmental problems that have challenged planners throughout the automobility transition.

1. Introduction

The mass adoption of motor vehicles (the 'automobility transition') was one of, if not *the*, major socio-economic transformations of the 20th century (Geels, 2012). Over the 80 years in which the car has "wound itself inextricably into a large part of our affairs" (Buchanan, 1963: 52), much research has been undertaken about the evolution of the socio-technical systems that have facilitated mass car ownership, and how the economy and society have been transformed by automobility (Urry, 2004, 2008), from the sheer distances travelled in everyday activities to the location of economic activity, the operation of the housing market, the structure of retailing and differential access to educational and health opportunities. Alongside these huge gains in prosperity and quality of life, however, came the well-known negative externalities of mass car use, such as congestion, crashes, poor air quality, physical severance, social exclusion and inactivity/obesity, which the state has often struggled to manage effectively.

Most contemporary imaginings of 'Smart Mobility' describe a transition of equivalent reach and significance to that of 'automobility', focusing on a range of positive changes to how we travel around. Proponents of the 'Smart Transition' outline a vision of the future in which mobility will be framed as a personalized 'service' available 'on demand', with individuals having instant access to

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a seamless system of clean, green, efficient and flexible transport to meet all of their needs (see Wockatz and Schartau, 2015). Accompanied by the widespread adoption of connected and automated vehicles (AVs) (see Fagnant and Kockelman, 2015), it is argued that the 'Smart Transition' will bring huge gains in safety, and the costs of transport to the user will be lower because the capital stock of the mobility system, primarily infrastructure and vehicles, will be used much more efficiently. There will be much greater consumer choice as new models of shared ownership of mobility assets, real-time aggregation of data and peer-to-peer mobility matching reduces the grip of large monolithic providers on the supply of transport.

Given that the state took several decades to come to terms with the challenges of managing the car and the profound impacts of the automobility transition on the economy, the environment and society, there is no time to be lost in beginning the task of thinking through how state action and public policy will need to change to take account of the implications of the transition to a 'Smart Mobility' future. This is particularly so given that the push towards a smart future is being led by the technology sector, which has a product – the sensors, vehicles, and software etc that underpins Smart Mobility – to sell, and where some interests will seek to create a market in which there is *more* mobility, not less, in order to maximise its returns. Only a naïve view would see the producer interests of a sector estimated as being worth 1.0–1.5 trillion US dollars by 2025 (Wocatz and Schartau, *op cit*) as inevitably aligned with the wider, more complex needs of society as a whole. In this paper, we explore the key contention that the transition to Smart Mobility as currently envisaged will require an equally important and far-reaching transition in the governance of mobility, so that the Smart Transition delivers more, rather than less, public value.

The paper proceeds as follows. First, we set out the two pillars of our analytical framework. In order to frame our understanding of what the 'Smart Mobility' transition is and what its implications might be, we review how thinking about innovations in mobility can be contextualized within work on the progression of wider socio-technical transitions. We then, in Section 3, apply literature on how the state might effect its own strategic transition from the traditional task of carrying out 'public management' to instead ensuring the capture of 'public value' in order to approach the challenge of governing the Smart Mobility transition effectively. Section 4 then considers why governments have traditionally intervened in transportation in order to complete our framework against which the governance of 'Smart Mobility' innovations can be assessed.

Section 5 introduces some key elements of the Smart Mobility transition as currently postulated, including new actors entering the mobility marketplace and their commercial propositions, infrastructure requirements and the centrality of data ownership and management to the operation of the Smart Mobility system. Section 6 then reviews four cases which were selected by the authors as posing distinctive governance challenges and these are discussed through the framework established in Sections 3 and 4. We conclude with some key messages surrounding the necessary transition in the governance of transport that must accompany the transition in technology.

2. The 'Mobility System' and socio-technical transitions

Frank Geels' work on the notion of the Socio-Technical System (STS) is a useful starting point for exploring how systems of provision such as the mobility system emerge, and how innovations such as smart technology break into such systems once they are well-established (Geels, 2005, 2012). Important to the STS concept is the notion of an extant and dominant *regime* which comprises technology (e.g. cars and traffic lights), infrastructure (tracks, roads, filling stations and paths), knowledge, markets and user practices, cultural and symbolic meaning, policy and institutions, and the industries involved in production and operation. Such a conception allows for the multiple factors that affect the setting of something like a speed limit to be considered in the round, and importantly illuminates why change might be difficult. It is not simply a matter of engineering know how, road design nor policy preference, but also a matter of negotiating social norms, customs and practices.

Whilst for many decades the dominance of the automobile and the existence of siloed approaches to managing transport around distinct transport modes has dominated thinking about the path dependence of planning and the fixity of the 'regime' (Low and Astle, 2009), this may now be changing. There is no doubt that in the 20 years since the mass adoption of the worldwide web, and the decade or so since the emergence of the smartphone these technologies have transformed many aspects of everyday life in less than a generation, leading to a situation in which the ways we communicate with each other, how we organise patterns of work, shopping, and socializing, as well as the information we have available whilst physically mobile are unrecognisable from only a few years previously (see, for example, Castells et al., 2014; Wang et al., 2016). It is the transformation in what and how things get done which Watson (2012) suggests, marks the transition of a socio-technical system.

Like any other complex socio-economic system, the mobility system can be described as 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" (Rotmans et al., 2001: 16). Thus the automobility system is comprised not only of the "manufactured object" of the car, but a set of diverse factors ranging from the cultural importance of the car as an icon of "individual consumption"; to the belief system that shopping mall and suburban quarter-acre house plot represented the "good life" and so on (from Urry, 2004:25–26).

Just, therefore, as the real importance of the automobility transition lies in the ways in which it altered established ways of conducting everyday activities – and then in turn changed the kinds of activities people undertook – so the same is true for the 'Smart Mobility' transition. As Wadud et al. (2016) point out, the potential for automated vehicles to reduce end-to-end travel times for a complex array of possible journeys will have much more profound impacts on society and the economy than simply some time savings for individual activities however important these might be in themselves: as the Smart Mobility system evolves, the new mobility opportunities it presents will lead to a reconfiguration of the systemic elements that produce different mobility outcomes in the first place, such as land use patterns, employment and housing locations, and so on (see, for example, Kim et al., 2015).

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