Introduction

This chapter explores transport governance in relation to ‘smart mobility’ with the aim of providing an overview of current knowledge and identifying current and future issues. Smart mobility is a wide and somewhat fuzzy term which covers both new modes and tools which integrate these modes, as well as the introduction of ‘smart’ technologies to what might be termed traditional public transport (i.e. buses, trams and trains). By encompassing new modes (see subsequently), smart mobility is seen by many as a broader concept than intelligent mobility (IM), which is generally more narrowly focused on the application of digital information and communication technologies (ICT) in transport. IM developed out of an earlier technological development in transport described as ‘intelligent transport systems’, generally shortened to ITS (Mulley et al., 2019). Lyons (2018) provides a genealogy and critique of these terms, finding that they are poorly defined, contested and, in the case of ‘smart’, at least, more marketing driven than founded on specific characteristics:

Where smart (urban) mobility is referred to in the literature, it appears to commonly be the case that its definition is vague, ambiguous or even absent. There is almost a sense that its meaning should be implicit, and assumed to be an axiomatically positive manifestation of technologically-based developments in transport systems, services and their use.

(Lyons, 2018, p. 6)

For the purposes of this chapter, ‘smart mobility’ is used, as it is now the term more widely used in city contexts compared to IM. Furthermore, IM tends to apply more to the application of information and communication technologies within transport, whereas smart mobility extends to new services that involve hybrids of ICT and vehicle developments (such as e-scooters or bike sharing schemes).

In recent years, there have been numerous technological developments in transport that fit within the broad smart mobility concept yet have diverse characteristics. In addition to ITS and some of the developments that were part of that (e.g. advanced traveller information.
systems [ATIS]/real-time passenger information [RTPI], and sophisticated systems for managing traffic flow), a diverse range of innovations are characterised as ‘smart’. For example, sharing schemes for bicycles, cars and increasingly scooters can be regarded as smart mobility as much as smartcard-based access to transport (sometimes combined with other services) and Mobility as a Service (MaaS). For many commentators and actors, electric vehicles (EVs), connected cars and autonomous (or self-driving) vehicles (CAVs) also sit within the smart mobility concept. The diversity of both the characteristics and the effects of these innovations, coupled with the associated entry to the transport domain of new actors from other sectors, in particular information and communications technology, creates challenges for the existing governance regime which has been shaped around so-called ‘automobility’ (Urry, 2004), that is, the dominance of the car (Marsden & Reardon, 2018). The diversity and disruption of transport norms through the introduction of modes that are not part of the existing governance regime also increases the potential scope for negative impacts and issues. That this pace and diversity of transport innovation creates challenges for the governance of transport is recognised (Moscholidou & Pangbourne, 2020). Furthermore, the expected impacts of innovation also have implications for the governance of spatial planning and the built environment, not least because one consistent approach will not fit the diversity of places and governance arrangements (Docherty et al., 2018; Hodson et al., 2017). The recent and current innovations entering the transport system are introducing new actors (e.g. technology companies) as well as new capabilities for both authorities and individuals (e.g. new digital data and planning tools).

A great deal of what is termed smart mobility is entwined with digital technologies and artificial intelligence and is also heavily imbued with a particular discourse around what constitutes ‘smartness’. As an industry sector, digital innovation is itself promoted in policy as a focus for future economic growth, which further extends the range of actors interested in smart mobility, due to its close association with information and communications technology. As a result, there are many factors to account for when governing what can be allowed or enabled in different contexts, including the impact on public transport, currently understood as comprising systems of collective transport (or mass transit systems) such as trains, metros, trams and buses (and ferries in some cities), with standardised fares and designated (usually fixed) routes and stops. The efficiency of public transport is generally based on achieving an economy of scale from the transport of large numbers of people (Rodrigue et al., 2017) and thus tends to be more developed and sustained in urban settings rather than rural, where populations are dispersed and routes are circuitous.

The chapter is organised as follows. Explanatory definitions of smart mobility and governance are followed by a section exploring the governance challenges posed by ‘smart mobility’. This section examines the challenges from the perspectives of complexity, co-ordination and uncertainty before considering the impact on policy choices and the need for greater understanding in transport and urban governance of the need for responsible innovation and finally, a consideration of ‘readiness’. This is followed by a section considering the role of governance in shaping the future of public transport, and how smart mobility innovations create issues for transport governance now, in the short term and longer term. The challenge is to consider how smart mobility requires consideration in terms of redefining what is meant by the term ‘public transport’ in an age where the challenges of climate change and congested infrastructure both suggest that accessibility should be prioritised over mobility. This section closes with a consideration of societal change and smart liveability. The conclusions section closes with a short summary of the key points, recommending that an accessibility approach is placed at the heart of transport governance in order to better transcend sectoral boundaries and to enable the
consideration of smart mobility innovations in the round and to consider social equity, take an anticipatory approach to regulation and ensure that infrastructure decisions have some flexibility. The emergency active travel measures that have been enacted by towns and cities in response to the global pandemic of COVID-19 are put forward as an example of how greater flexibility and speed of response is, in fact, possible. The chapter closes with the identification of key areas for future research, highlighting continued gaps regarding barriers to the transfer of ideas from design-oriented fields that focus on the qualitative aspects of lives and spaces into transport governance. It is suggested that ICT-led smart mobility induces a distracting form of technological optimism, and it is instead advocated that a better role for ICT is to harness it to restore public trust in public transport, most particularly buses. This would help to ensure that mass transit can be the essential core that MaaS needs. New ways are also needed to limit the use of private cars and to further active travel and public transport where these are the more rational solutions for collective and hence ultimately individual good.

What is smart mobility?

As illustrated in the introduction, smart mobility is a multifaceted concept. Many internet sources will link it to the notion of smart cities, but finding a single clear definition is difficult. A search of Google Scholar for the terms “smart AND city AND mobility” is likely to return thousands of responses. Searching on the main Google site is even more confusing, as many more private-sector sources of ‘thought leadership’ will be returned in search results. Industry and venture capitalists sense opportunities for large profits to be made. In a very real sense, the terminology of ‘smartness’ represents an industrial-political agenda that tends to generate a lot of highly positive rhetoric, or “producer-led imaginings of how technological innovation will solve apparent mobility problems”, as Docherty (2018) puts it (p. 19). Finding clarity amidst this noise is not straightforward.

Mobility, broadly, is the ability of people to connect with one another and with opportunities to meet their needs. This could involve personal travel, freight movement or connecting via telecommunications instead of travelling (sometimes described as virtual mobility). Increasingly, the technologies of moving people and goods have been enhanced by ICT, as well as it being used as a substitute for travel. As this trend has gathered speed, the domain of transport has become increasingly referred to as ‘mobility’. There has also been a great deal of innovation in the forms or modes by which transport of people or goods can be carried out. New terminology is being generated almost as fast as the innovations that it describes. To add to those already mentioned, there is also micromobility (in transport, this generally indicates slower-speed small conveyances without internal combustion engines such as electric scooters, city bike hire schemes or Segways), MaaS, various forms of ride and vehicle sharing (often with conflicting definitions in different parts of the world), connected cars and autonomous (or self-driving) vehicles and automation of demand or congestion management (e.g. smart motorways), as well as smart logistics. All these developments are underpinned by ICT, including mobile ICT, and increasingly by sophisticated machine-learning algorithms and extremely large amounts of digital data (a.k.a. big data), generated by system users through mobile phone traces, connected vehicles and connected infrastructure (through the Internet of Things [IoT]).

This is the complex array of technologies indicated by users of the term ‘smart mobility’. Smartness is thus a concept that is increasingly utilised as an umbrella term to indicate, generally uncritically, the deployment of ICT and artificial intelligence in the management of daily life, businesses, cities and transportation, increasingly at an individual (customised) level. The
discourse that has grown up around the word ‘smart’ carries connotations of cleverness, of doing things better and more efficiently, and has replaced the word ‘intelligent’ in many transport/urban circles. However, as with any human endeavour, there can be a tendency to assume that the desired characteristics are conferred by default if something is described as ‘smart’.

However, the notion is also contested, and there are rival characterisations of mobility and smartness. Sheller (2018), for example, describes how smart mobility can be seen as an element of a transition to a ‘new mobility paradigm’ based on sharing, connectivity and accessibility. The original connotations of sharing are communitarian, not capitalistic, and this perspective underpins the rise of advocates for mobility justice and sustainability, where being smart is more aligned with a person-centred approach in which technology is a supporting or enabling character: infrastructure and norms for active travel (walking and cycling), liveable streets and safety policies that drive down casualty rates (for example, the longstanding Vision Zero movement, Swedish Transport Administration, 2012). From this perspective, urban and transport governance are critical processes for (re)zoning, charging for pollution and congestion and managing travel demand to reduce or remove overdependence on cars.

Indeed, Parkhurst and Seedhouse (2019) define smart mobility as “the belief that by significantly increasing the application of computer science technologies in the transport sector, long-term aspirations for more efficient movement of people and goods, with fewer negative consequences, will finally be realised” (p. 349), and Marsden and Reardon (2018) describe it as akin to jargon, being “more a label with currency than anything specific” (p. 2). Moscholidou and Pangbourne (2020) use the term to refer to “new and emerging transport services, such as peer-to-peer ridesharing (Uber, Lyft), carsharing (Zipcar), dockless bikes and scooters (Lime, Mobike), as well as integrated travel information and ticketing applications (Mobility as a Service)” (p. 171). Numerous academics have highlighted the tendency for the promoters of these novel services to present them as offering efficiency gains, greenness and accessibility (see Dowling & Simpson, 2013; Cohen, 2012).

The typical pitch of new service providers at transport authorities is that the on-demand access to this shared or micro-mobility offer will replace car ownership and is thus more efficient and sustainable (Docherty et al., 2018). However, the product is not really the vehicle but the user, as the operators are seeking to monetise the data by making the user offer more and more personalised and compelling and selling the information that they acquire as a result (Lyons, 2020). The rhetoric of the vision that is being sold has been critiqued by Pangbourne et al. (2020) as selling a false promise of unfettered freedom to users in what is a finite network.

For those responsible for regulating, steering and providing for the public good in towns, cities and rural regions there remains an urgent need for information, preferably evidenced, to enable them to reflect on and evaluate the impacts that such technologies will have on patterns of mobility, as these are themselves shifting due to other societal changes taking place outside the transport ecosystem (for example, COVID-19 pandemic mitigation measures). There are other impacts from disruptive influences as well – social and distributional effects. Thus, equity and our ethical standards are in play as well.

**What is governance?**

In the context of this chapter, governance should be understood as the co-ordination and steering of networks of interdependent actors through the application of institutionalised rules (Treib et al., 2007; Marsden, 2019). The use of the term in relation to studies of politics and policies indicates more than government, where that term refers to formal state institutions that hold
a monopoly of power to direct and maintain public order and collective action (Stoker, 1998). To talk in terms of governance therefore is to indicate that state power is dispersed through a range of organisations of different constitutions that are networked together (Rhodes, 2011). This networking, the delegation of state authority to different agencies and outsourcing of some or all public services to the private or third (voluntary) sector, blurs boundaries between state, private and voluntary, as different scales and levels of organisation are involved and have to negotiate to build trust and establish shared goals. Crucially, in such networked governance systems, the role of the state becomes one of imperfect steering rather than directly providing and delivering policy and services (Osborne & Gaebler, 1992) (see also Chapter 2).

An implicit assumption of a governance perspective, therefore, is that power is diffused through the system, held in a formal sense by some actors but exercised more or less effectively, as a positive or resistive force by all. A governance perspective regards the state (or government) as just one actor amongst many that have a role to play in governing different sectors, including transport. This is particularly the case in countries and co-operative regions like the European Union where there are multiple levels of government operating across different scales and where some or all of those levels are mandated to work in partnership with non-governmental actors: a phenomenon that is generally referred to as multilevel governance (Bache & Flinders, 2004).

Thus, in the case of transport, the task of governance is to decide what should be enabled (either freely or with regulation) and what should be prevented or limited, for the public good:

If stewardship of the future is valued highly then it can be suggested that regardless of technological enablement and sophistication, effective mobility should be taken as that which plays its part in shaping and supporting the sort of society we want – economically prosperous but also socially desirable and environmentally sustainable.

(Lyons, 2019, p. 388)

Davis also responds to what she calls a barrage of “non-stop, disruptive innovation” (2018, p. 120), calling for reflection about the types of cities we want to live in as a guide for what should be advocated for or adopted rather than allowing technological determinism to overwhelm our capacity to govern. However imperfect the steering (Osborne & Gaebler, 1992), an attempt must be made (Kaiser & Prange, 2004).

The governance challenge of smart mobility

In relation to the governance challenge of handling the barrage of disruptive innovation claiming to offer smart mobility, there are numerous inventions that could be described as solutions looking for problems. So-called flying cars, hyperloops and low-earth orbit transport might more clearly be seen of that kind, being led by an excitement about technology with only tangential focus on real-world problems. It might seem relatively easy to dismiss these proposals as sci-fi fantasies developed by entrepreneurial actors with deep pockets and obsessive enthusiasm. An alternative perspective is that these propositions are spear-headed by powerful private actors who are seeking to co-opt the mobility regime (Sheller, 2018) to create a new system of infrastructure that (arguably) suits their private aims. On the other hand, bus priority technologies and real-time passenger information, whilst prosaic and unexciting to the wider public, can more clearly be seen as innovations designed for recognised problems and which emerge from within the incumbent regime of public transport actors via a commissioning of bespoke ICTs.
Complexity, co-ordination and uncertainty

In between the two extremes described previously, there are numerous large and small inventions lying somewhere between solutions for identified problems and solutions that are attempting to define a problem. As there are many governance-related questions to answer for each proposed solution, the multiplicity of possible options, sometimes at different stages of technological readiness, introduces both uncertainty and complexity. For example, urban/transport governance actors typically ask themselves questions such as: Should we invest in reviving mass transit now, or should we wait and see if CAVs reach level 5? Where there are multiple inventions to consider at the same time or in quick succession, how should this complexity be coordinated and managed? For each proposition, it is necessary to ask:

- Can it operate alongside the existing transport system, or does it need to be integrated with the existing public transport system?
- Do the institutions of transport governance have the regulatory levers to influence how this innovation develops?

Difficulties arise because different stakeholders have different principles on which their attitudes and hence decisions about any proposed type of smart mobility are based. Mladenović (2019) drew on Docherty et al. (2018) and Pangbourne et al. (2018, p. 104) to state: “One starting premise is that governance of smart mobility technology must relate to the notion of ensuring and enhancing public value”, whilst at the same time handling ‘deep uncertainty’ which demands flexible and open approaches to visions (Lyons & Davidson, 2016). Mladenović (2019) argues it is clear that governance can only address these challenges if actors understand that technology is a social as well as a technical phenomenon. Whilst Mladenović was considering only self-driving vehicles (or AVs), this premise really applies to all technical inventions, as they become innovations only when adopted and used at sufficient scale. Innovation is seen as an essential characteristic of the modern competitive city, so the desire of states and cities to be ‘innovative’ is one driver for the attractiveness to decision-makers of many of the proposed inventions.

However, in the case of the governance of transport, policy and infrastructure, investment is typically delivered and regulated through different levels of government, each of which has a different remit, though the cross-boundary nature of transport and its infrastructures creates overlaps (between nations, regions and municipalities, for example). To take a single subdomain as an example, parking is generally regulated and managed at the local government level, whereas traffic management and road infrastructure tend to have several government levels involved, operating across different scales. In each case, there are also other actors involved, either as formal governance partners or as interested and impacted stakeholders. People seeking to park may come from within or outside the local area, meaning that pricing of parking may have social equity impacts. Furthermore, many economic sectors have strong views on the importance of the availability of parking for smooth operation of their core functions (i.e. hospitals, places of education, workplaces large and small, retail outlets, leisure facilities), but their perspective has long been handled through formal consultation processes (and a lot of lobbying). However, street and kerb space is increasingly contested and not fairly allocated (Creutzig et al., 2020). First, private cars are inefficient in terms of asset use. Shoup calculates that private cars are parked for around 95% of the time, though this is not always on the public street (Shoup, 1997). Logistics companies have long needed kerb space to make deliveries and pick-ups, buses and trams need space for designated stops, cyclists need protected space that is generally
sandwiched between moving and parked vehicles and pedestrians need safe and uncluttered pavements. Newer forms of mobility are introducing new kerb-side conflicts: EVs need charging infrastructure, bike-share schemes need docking stations and newer dockless shared mobility services (whether bicycles, e-scooters or mopeds) will be left in unpredictable places.

Platform-based mobility services have also entered this domain of kerbspace management. For example, ‘pay and go’ apps have emerged for paying for parking. Such products are increasingly adopted by local authorities who see the opportunity to remove parking meters and ticket machines (and the costs of operating them), which looks less like proactive governance and more like reactive management. Other platform-based mobility services are being developed to manage pick up and drop off (PUDO) zones that are needed to manage how shared vehicles utilise picking up and dropping off customers. Local authorities in Australia (such as Waverley Council Local Government Area) are actively commissioning innovations in this area. A key reason for this particular example is that governance actors need to stimulate innovations that encourage sharing as a means of breaking car dependence. This could also be seen as an admission that public transport has failed to compete with the private car and sharing cars through ride-hailing services are seen as better able to compete with the car by replicating key characteristics such as private occupancy, comfort and door-to-door service. The great success of ride-hailing services with the public has already created new kerbside conflicts and undermined public transport (Pangbourne et al., 2018).

**Policy choices**

Clearly these innovations, which are hybrids of ICT, transport modes and transport-related processes, increase the choice set for policy makers in dealing with the problem of allocation and management of scarce space in the face of declining resources. However, though it is not always recognised, it is important to acknowledge that these policy choices are not apolitical. Vigar (2002) highlighted that ways of addressing transportation issues are generally highly contested and contentious; furthermore, land-use choices entwined with transportation technology development and infrastructure decisions have broken centuries-old spatial relationships between home, work and leisure opportunities that were shaped by the ‘tyranny of distance’. This in turn has shaped social practices and expectations around mobility, first driving increased demand in developed economies and now increasingly in the Global South.

The dramatic increase in traffic creates significant pressures on urban management and place-making (car dependence, congestion and air pollution have health, economic and social impacts) and causes significant environmental damage (land take, greenhouse gas emissions, pollution of air and water impacting biodiversity). Early indications of the impacts of some smart mobility innovations are that they do not necessarily lead to more efficiency or sustainability. Parkhurst and Seedhouse (2019) outline some of the issues surrounding the business model of platform-based transport services like Uber: establishing a presence by appealing to a wealthy elite for whom the value of time is high, a decline in service standards by circumventing regulations intended to protect the public good, undermining employment protections and poaching the customer base of public transport. As these services are perceived as ‘sharing’ services by governance actors, they are rather uncritically assumed to be already capable of reducing private car use, if not ownership. However, this is not yet borne out by preliminary data, which shows that the ride-sourcing/hailing services provided by transportation network companies (TNCs) such as Uber tend to draw custom away from traditional taxis and public transport (de Souza Silva, 2018; Tirachini, 2019). This emphasises that the theoretical potential of TNCs to supply first and last mile services to support public transport by extending its reach needs strong
governance to ensure greater efficiency and carbon emissions reductions. The growing knowledge of the need for contractual, regulatory and design processes that are needed for MaaS, of which TNCs can form an important element, is an important development that shows promise for delivering the benefits and mitigating the negative impacts (e.g. Mulley & Kronsell, 2018; Fenton et al., 2020) (see also Chapter 3).

**Responsible innovation**

Consequently, it can be seen that all the possibilities that are offered in the smart mobility domain should not be assumed to be responsible by design (Sotarauta & Kautonen, 2007). The primary objective of a TNC or the global companies that supply e-scooters or dockless bikes is not to serve a ‘public good’ by enabling sharing, as they are economic actors in a capitalist system in which the greatest return is increasingly through platform-based models where the data is currency (Srnicek, 2017). Whatever the sector, the TNC model is to disrupt the status quo through predatory business models, often kick-started through sources of venture capital and the founders eventually being bought out by the largest players, such as Google or Amazon (Srnicek, 2017). Governance actors are having to grapple with making difficult investment decisions regarding a range of technological innovations with different properties and potentials alongside entirely new global-scale issues, each of which has significant unknowns and potentially high-impact risks with wide uncertainty ranges. It is beyond the scope of this overview to provide more than a cursory and bounded coverage, but the point will be illustrated with reference to CAVs. Many governments and corporations are pursuing the development of CAVs, which involve a complex array of different technologies for sensing the environment (including other road users, mechanised or others) and vehicle condition, processing data and making decisions (Parkhurst & Seedhouse, 2019). There are also different degrees or levels of autonomy, with the highest level defined as a vehicle utilising an automated driving system full time for all aspects of the task, under all conditions, without a human driver (SAE International, 2014). This ambition is the goal of engineering in this domain, but there are increasing doubts about whether this is achievable even in the longer term. However, it is not yet clear whether the CAV vision is one of providing autonomous mass transit with greater flexibility than the current fixed-route public transport model or whether the vision is one of replacing private cars with private CAVs of a similar capacity or a combination of the two.

The promotion and investment of CAVs represents a dominant and disruptive vision of future transport (Mladenović et al., 2020; Hopkins & Schwanen, 2018). A variety of actors are involved in developing CAVs, from car manufacturers to Silicon Valley new technologists. Governments are investing in the research and development for CAV, but most work to date has been on small low-occupancy vehicles that are more of a replacement for the private car than a form of public transport. However, there are projects by major bus companies in both the United States and the United Kingdom to develop AVs for higher-occupancy transport, such as by FirstGroup with its projects in the United States and more recently in the United Kingdom with Project CAV Forth funded by Innovate UK.

However, true ‘readiness’ is still some way off. There are still many technological and legal issues that need to be resolved, for both the vehicles themselves and the infrastructure (Lyons, 2019), as high-level governance issues. CAVs are not yet a significant issue for more localised transport governance, though they can already be a distraction from more pressing transport-related issues, as it can seem to some policy actors that waiting for a technological solution in the future that is always five years away would remove the need for investment in traffic management today. However, the longer-term implications of success in developing CAVs stretch into the
domain of the future of work, as “if all the technical, regulatory, financial and public acceptance barriers are overcome, professional road transport-driving jobs could disappear” (Parkhurst & Seedhouse, 2019, p. 352). There is clearly a need for some anticipatory governance to ensure that CAV developments enhance mass transportation options rather than acting against them, on the grounds of social equity, public health and transport efficiency (e.g. Cohen et al., 2018).

Shaping the future of public transport

Several recent commentators have highlighted the risk of unintended or unanticipated negative impacts from technological innovation. For example, CAV first-order effects to improve road safety and widen access to personal mobility for those currently unable to drive could be accompanied by second-order effects that perpetuate or deepen sedentary lifestyles currently associated with car reliance, leading to third-order effects on public health (Lyons, 2019). There are also social equity questions – and, as highlighted previously, Parkhurst and Seedhouse (2019) foresee a loss of driving jobs if CAVs become a reality; there is also a risk of exacerbating transport poverty, creating new poverties or leaving existing poverties unaddressed. Some of these foreseen drawbacks could be mitigated if the development of CAV is steered towards shared vehicles as low-occupancy public transport service rather than individual ownership, as discussed previously. Other chapters in this Handbook address a range of relevant issues that policy and governance need to account for (see also Chapters 26, 28 and 31).

Spatial effects: crossing boundaries, urban management and rural areas

It is well known that many trips cross administrative boundaries and that the governance of transport of nearly all types involves cross-boundary co-ordination by governance actors. This can be about standardisation for operational reasons, fairness (e.g. parking charges) and smoothing regulatory burden for the private sector (Marsden, 2019, pp. 35–36). Thus, there is already a requirement to co-operate but against a background of tension between levels and scales of government and between different types of actor (governmental, non-governmental, private). New entrants associated with smart mobility create more tensions as they seek access to public space to operate their services and gain control of the future mobility landscape.

This poses challenges for transport governance, as there are many uncertainties about the effects of some of the new mobility services. For example, whilst shared scooters are seen by many as a nuisance that must be managed (and in many places, it is not legal to use them on either the pavement or the roadway), they are unlikely to pose great changes to patterns of use of urban space. However, CAV or MaaS could have a large impact on our travel patterns, which clearly takes the issue of governing smart mobility beyond the transport sector and involves urban and land-use planning (see also Chapter 3). Though there is as yet little concrete knowledge of how this would play out, studies of actual ride-hailing behaviours suggest that public transport use is undermined, as users don’t use ride-hailing for first/last mile for bus journeys but use it for the whole trip, as discussed previously. This emergent practice is one that needs to be controlled if the estimated efficiency gains of co-ordinating carpooling with public transport (i.e. multi-modal journeys) are to be realised (Wright et al., 2020). A legitimate inference from this is that MaaS could have a similar impact on ‘Uber’-style car trips unless the pricing of the public transport offer through the platform can be made sufficiently attractive to users. Whilst research is now emerging on MaaS, it is still an area with considerable knowledge gaps relating to service design as well as to the collaborative processes needed to engage the full range...
of transport service providers, particularly traditional public transport operators (see Schulz et al., 2019, for example), and providing effective MaaS for rural areas remains a key unknown (Pangbourne, 2020).

Navigating into an unknown future

Lyons (2019) talks of the need for a policy shift away from the futuristic, techno-utopian terms ‘intelligent mobility’ and ‘smart mobility’ to focus instead on what is effective. This chimes with Pangbourne and Anable (2011), who noted that whilst the application of technology to transport problems might be necessary, it would not be sufficient without other supporting actions, particularly behavioural and practice related, in tandem with a closer attention to energy pathways, to address emissions reduction (now more generally referred to as ‘low-carbon’ or decarbonisation). There is increasing evidence, using diverse methodologies, that the smart way to govern the necessary transition to a low-carbon future, which transcends the transport sector, is to approach issues systemically rather than sectorally (see van Wee & Handy, 2016). This strongly suggests that a focus on mobility (smart or otherwise) is misdirected. Accessibility is the real issue that governance actors should be facilitating. This is noted by Vigar (2002) and is reflected by Lyons and Davidson (2016) with the ‘triple access approach’. The advantage of this approach is that immobility (or virtual access) is an equal partner to trip-making.

Accessibility rather than mobility

By reframing the focal issue away from providing transport to ensuring accessibility, the aim of the task of governance remains a challenge, but accessibility provides a lens through which plausible social impacts of the various contenders for facilitation or regulation can be assessed. It provides a clearer means for considering what Marsden (2019) highlights: that it is essential to think about how to shape the capabilities of emerging technologies so that they fit with each other as well as within (or alongside) our existing systems of provision (in this case, public transport), as this will minimise the risk of conflicts and missed opportunities.

Thinking in this way is very difficult in terms of governance, which, in transport at least, has been heavily reliant on traditional forecasting techniques. As the level of uncertainty increases with respect to future conditions as a result of a complex array of emergent challenges such as the risks and effects of climate change, economic instability and global pandemics, forecasting based on past trends loses its utility (Goodwin, 2020, pers. comm.).

The pressing need in governance of smart mobility is to overcome the inertia that comes from out-of-date thinking and from what Mattioli et al. (2020) refer to as the “latent predisposition to car use”. However, Marsden et al. (2020) assert that the common understanding that transport patterns (and the practices and behaviours that lie beneath them) are difficult to change is wrong.

Smart liveability and societal change

Immobility, or the ability for individuals to achieve the activities they want or need closer to home or by means of virtual access, is now a feasible proposition with ICT. As Lyons (2019, p. 384) puts it, “the motor age and the digital age have collided and are now merging”. Suggestions that smart mobility (including CAVs if they are realised) can support more ‘liveable’, productive cities, with both better accessibility, reduced car reliance and less domination of urban space by transport infrastructure, are compelling but not certain without proactive governance
Models and forecasts need to change. The distinction between trips and activities as separable uses of time are increasingly blurred and potentially obsolete for some modes (such as train journeys longer than, say, 30–60 minutes). The ability to utilise travel time in ways that are valued by the traveller means that the currently used valuations of travel time savings used in transport appraisal no longer hold true.

Yet at the local level, co-ordinated governance of land use, economic policy and transport can build local lifestyles. Sustainable urban planning ideas promote the development of built environments where most things are accessible within 15–20 minutes by active travel modes (Capasso da Silva et al., 2020). Reducing the need to travel would seem much smarter than relying on a constant innovation cycle for ever more complex technologies; Paris Mayor Anne Hidalgo promoted the notion of a 15-minute city as part of her re-election campaign in early 2020 (see The Guardian, 2020). Fewer trips for shopping are widely anticipated, as internet shopping has grown as a normal social practice, and furthermore is a practice that has been necessitated in many places by the COVID–19 pandemic.

A useful approach to reframing the problem and enabling governance actors to act in a way that can balance the tensions between the state, the market and society would be to adopt a transitions management framework (Hopkins & Schwanen, 2018). This is a reflexive approach to governance that first emerged in the governance of sustainable development (Loorbach, 2010). The particular advantage of this approach is that it is oriented towards goals and modelling around those rather than meeting a prespecified outcome to which planning and control processes can be applied (Kemp & Loorbach, 2006).

Hopkins and Schwanen’s work examining the UK state’s investments in CAVs is instructive as they highlight how decisions have political and economic intentions but also consequences. For example, they note that all the initial trials of vehicles were in the south of the United Kingdom, which risks further skewing regional imbalance and fuelling perceptions of political bias. It is also noted how the decision about investing in CAVs at all has geopolitical overtones of competing in an international race to be situated at the forefront of a technological breakthrough, as a strategy to drive economic growth.

Public transport, as traditionally understood, is profoundly challenged by some of the most prominent mobility innovations that fall under the heading of ‘smart’. This begs the question as to whether our understanding of what public transport is, that is, trains, trams and buses, needs to evolve, particularly as these more traditional modes are not, in many cases, any longer publicly owned (if they ever were in some places). Deciding what should be publicly owned is a political decision that should be informed by participative and democratic processes. Once that is decided, the subsidiary choice (awareness of which should ideally have informed the higher-order choice) is to decide what modes should be permitted on the transport network and how they should best be regulated and controlled to meet the needs of the times. This is a task that falls within the remit of transport governance.

For instance, MaaS is likely to be most effective in making urban transport and in certain contexts rural transport more efficient, in terms of congestion and emissions, when it is firmly underpinned by mass transportation modes, with support for the first and last mile via more individualised modes (Hensher et al., 2020) (see also Chapter 22). MaaS also has some promise, in certain circumstances, in supporting rural mobility, where traditional public transport has faced greater challenges than in urban settings (Eckhardt et al., 2018; Gogola & Sitányiová, 2020).

MaaS is described by Mulley et al. (2019, p. 187) as probably “the most important contemporary application of intelligent mobility”. Yet mobility that is not achieved via walking
or individually owned vehicle (whether that is a bicycle, motorcycle or car) has always been a service (in a very real sense, the roads and pavements, i.e. infrastructure, are themselves also a service). MaaS, however, is not a transport service but a platform by which many transport services can be accessed (c.f. Lyons et al., 2019). It is thus an ICT product and follows design principles established for customer experience and usability. If the interface and capabilities supporting smart mobility are not applying user-centricity as an organising principle, individuals will not adopt and use the product where there is an alternative. Thus, there is inevitable pressure to deliver easy access to the transport services that meet existing user preferences rather than collective need. This makes shifting behaviour towards more sustainable modes (or potentially not travelling at all) much more difficult and highlights a difficulty for transport and urban authorities in managing demand for finite services in finite space.

The user-centric nature of this approach to organising access to transport/mobility reveals the true commodity, which is data, as highlighted previously. Furthermore, much of what can be called public transport is no longer in public ownership and thus is already less easy to govern in jurisdictions that are operating free-market economies.

A MaaS platform can in theory be publicly owned, operated or regulated and can be designed to steer users towards the more sustainable options for each required or desired journey. However, the most sustainable modes for many journeys are not public transport as currently understood, namely forms of transport, most often buses, trains or trams, that have set fares and fixed routes. That buses could be demand responsive and flexibly routed has been known for decades (see Chapter 17). Despite many years of accumulated knowledge and technological advances, flexible public transport is still underutilised, and sharing trips in smaller vehicles is still not a widespread practice; Marsden et al. (2019) identify deep-rooted public reluctance to share trips with strangers in smaller vehicles, which will need to be overcome if the sustainability and efficiency benefits of the various forms of sharing via access platforms is to be realised.

Conclusions

Many of the core developments that lie at the heart of smart mobility present a challenge to the notion of public transport. The examples set out previously have surveyed the complexity, coordination and regulatory issues that are significant governance challenges. The chapter has also highlighted the political nature of the choices to be made, which will be a significant factor in shaping outcomes such as the future nature of public transport or urban form. The political choices are themselves calibrated against a background of considerable uncertainty about the direction and longevity of continuous shifts in lifestyles, social practices and travel behaviours that are observed.

Placing an accessibility approach at the heart of governance is advocated to overcome siloed policies and enable the diverse technologies to be assessed for their social and distributional impacts, supporting the notion that governance actors should apply responsible innovation thinking to decisions around what smart mobility inventions to permit and what to restrict. What is needed for governance for socially equitable accessibility, of which smart mobility is one mode of achievement, is to take a more anticipatory approach with regard to the regulatory environment and to enable infrastructure decisions to be more flexible. Some of the emergency street space reallocations that have been put in place in cities and towns around the world are one such example of how active travel can be provided with more space when a crisis demands. The better examples have emerged in cities where ‘tactical urbanism’ has a longer history in urban planning, places which are more alert to the trends and events which can alter practices and associated behaviours. Whilst these changes have happened seemingly overnight with COVID-19 responses, there had to be ideas about what to do already in existence. Whilst many
of these measures require no ICT, they are nevertheless smart. However, there are also notable applications of ICT to implementing quarantine measures and disease control for public safety (e.g. South Korea, China).

Nevertheless, despite the existence already of many ideas and inventions that can be applied immediately to make mobility smarter (if that means more efficient, cleaner, healthier and more supportive of liveable places), there is still research needed to understand the barriers that prevent good ideas around public mobility transferring from design fields (such as urban planning or architecture) to the field of transport governance. This is particularly urgent given the lack of time left to address climate change and given the distraction of technological determinism that is represented by ICT-led smart mobility. The COVID-19 response has also severely challenged public transport in many places, most particularly the United Kingdom, where many years of modal shift messaging has been reversed overnight in the name of public health and disease control. Smart mobility research needs to focus most particularly on how ICT might be utilised to restore public trust in public transport, particularly buses, in order to rebuild it as the core of MaaS and also find new ways to limit the use of private cars where other modes, particularly active travel and public transport, are more rational.

Note

References
Smart mobility governance


