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Urban Local Authorities and the Delivery of Micro-Mobility Strategies: Obstacles in the Implementation of Bicycle Hire in the UK

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Abstract

The pressures on urban local authorities to deliver mobility strategies highlight both their need and ability to connect problems and solutions, and then successfully implement the schemes. These difficulties are compounded by other distinctive pressures, from both above and below. From above there can be pressures from national government to deliver strategies, but at the same time not necessarily be provided with the necessary financial and political resources. From below, there can be an attraction towards innovators who can provide strategies at apparently little or no cost to the public sector. These relationships can be unpredictable and unstable, while the technologies themselves can display weaknesses, and be subject to change. The dynamics of the delivery of micro-mobility can therefore offer strong challenges to urban local authorities in constructing stable networks, mobilising public support for their actions, and in linking in with other transport services. The two case studies selected cover the development of bicycle hire in the UK, with particular reference to dockless bicycle hire. Even when the local authorities have active intentions to oversee successful innovations, they are unlikely to succeed without the stronger involvement of central government, including the necessary statutory powers, together with adequate financial resources and associated expertise.

1. Introduction

In recent years, there has been increasing pressure on local authorities in West and North Europe to encourage the introduction of technological innovations of micro-mobility as apparent strategies to tackle long-standing and deep-seated problems. This is particularly the case with regard to urban areas, where persistent problems such as traffic congestion, the quality and quantity of infrastructure, factors affecting public health such as ambient air quality, and public transport service integration, have all proved to be severe constraints on public policy. Given their position in systems of

governance and associated responsibilities, urban local authorities are charged with the delivery of practical strategies, but at the same time are at the fulcrum of complex and potentially unstable networks of relationships (e.g. Spickerman et al., 2014, Stead, 2016, Spinney and Lin, 2018).

Innovators who can offer systems at apparently little or no cost to the public sector may provide an attractive proposition. These private sector innovators can blur distinctions between the public and private sectors (Dudley et al., 2019), and also place the local authorities in the hands of the innovators in terms of economic and physical resources, and operational expertise. However, these relationships can be potentially unstable. Innovators can rise and fall, while the technologies themselves can display weaknesses, and be subject to change. In these cases, it can be difficult for the local authorities to frame strategies politically, and to construct successful narratives that win public support. Meta-objectives, such as environmental sustainability, accessibility, and service integration, may be publicly retained, but the pathways to delivering them are narrowed as they are compelled to adapt to changing circumstances (Fishman et al., 2015, Kent et al., 2017).

A local authority may therefore retain its meta-objectives, and seek to achieve these in the long-term, but the delivery of micro-mobility systems can require large amounts of resistance, resilience, and adaptability (Gardner, 2017). The aim of this paper is to enhance understanding of how urban local authorities respond to issues associated with the entry of mobility service providers in their jurisdiction in a context of limited resources, and engagement provided by national government. The focus on pressures from below reflects that the role of technological innovation in the delivery of local transport services is likely to become more important, especially with the recent emergence of e-scooters and current enthusiasm for mobility-as-a-service as strategies for local transport problems (Hensher et al., 2020; Abduljabber et al., 2021). It is worth noting here that, although the innovations are aimed at the public, there is little public input into either policy making or implementation processes. Instead, in the case of the UK, the public is generally regarded by both local authorities and innovators as people who react to events, rather than playing an active role in shaping them (Dudley et al., 2019). Mobility innovations also have broader social and environmental implications, including impacts on public space, public health, and issues of inequality (Buck et al, 2013). In the case studies in this paper, however, these broader issues were largely implied, and the chief concerns were with enabling the technologies to actually work in practice.

Dockless bicycle hire has gone through rapid growth and decline phases in some UK cities, caused by the instability in financial and operational terms that reflect business models used by the innovators, and the difficulties with the security and safety of the bikes (Fishman, 2015, Medard de Chardon et al., 2017). This paper provides an opportunity to examine and reflect upon how local authorities have managed, or failed to manage, this instability in innovation. The next section sets the management of innovation in the context of an analytical framework that considers the potential role that can be played by urban local authorities. In the following two sections, we summarise briefly the rise of bicycle hire, and the more recent introduction of dockless bicycle hire. The paper then examines the basic problems of dockless bicycle hire implementation in the UK, and the challenges posed to local authorities with few regulatory powers and limited financial resources. The two micro-mobility case

studies of dockless bike hire in Oxford and the West Midlands Bikeshare scheme are then presented, together with the qualitative interviews undertaken. Finally, comments are made on how partnership between the local authority and the innovator can help manage risks to both parties, and the wider contribution of dockless bikes to the overall integrated transport system in urban areas are presented.

2. Analytical Framework

The pressure to deliver effective strategies highlights both the need and ability of urban local authorities to connect problems and solutions, and then implement schemes successfully. With regard to need, Marsden and Reardon argue that, in the case of the UK, more hands-on government will be necessary to stimulate early adoption of some innovations, to tackle reforms to prices, and to manage co-ordination of new and ‘old’ mobility service providers, and to manage this in ways which protect the interests of all citizens (Marsden and Reardon, 2018, 149). Similarly, Davis proposes that we should not succumb to technological determinism and let our future cities be the aggregated product of a series of random innovations in the IT industry (Davis, 2018, 120).

In turn, this raises basic questions about the role taken by the state within these new networks to steer, facilitate, but also possibly reject, micro-mobility strategies. As Docherty et al conclude, at a time where governments around the world are seeking to shrink the state, and reduce administrative costs (simultaneously leaking expertise), it is difficult to be optimistic that governments, at different levels, will pick up the baton to orchestrate mobility transitions, despite the need for, and benefits of, action identified here (Docherty et al., 2018, 123).

The pressures on the capacities of urban local authorities are also compounded by other distinctive pressures, from both above and below. For example, from above there can be pressure from national government, which sets the wider political and economic agenda, to deliver strategies, but at the same time not necessarily provide the financial and political resources. Particularly in periods of economic austerity, such as in the UK following the financial crash of 2008, reductions in local authority finance can severely limit the level of resources available to take action locally, while a lack of regulatory and implementation guidance can leave urban local authorities in a weak position to assert their authority politically and administratively.

In seeking solutions locally, the authorities are also bounded by international, national, and local contexts. As Reardon and Marsden (2018) comment, mobility transitions are not taking place on a blank slate; the histories, traditions, cultures and expectations of the individuals, towns, cities, regions and nations in which transitions are occurring will inevitably shape the form they take, and the power dynamics that result. Consequently, there can be no ‘one size fits all’ in implementing new mobility systems. In this context, Schwanen (2016) has observed that policies do not move unscathed from A to B, but mutate when they are first de-territorialised through processes of abstraction – simplification, selection, exclusion – and then re-territorialised and made to fit historically emerged places elsewhere.

Apart from the financial and operational fortunes of the private sector innovators, even if the local regulatory authority seeks to assert its powers, the innovator can

attempt to challenge these legally. A prominent example in this case concerns the ride-hailing app Uber, and its operations in London. In 2017, the regulatory authority, Transport for London (TfL), sought to deprive Uber of its licence to operate, but Uber challenged this decision in the courts, and was successful in retaining its licence (Dudley et al., 2017). In 2019, TfL again attempted to terminate Uber's licence, but once again Uber successfully appealed against the decision through the courts. Politically, the regulatory authority may find it difficult to assert itself over an innovator that has wide public support.

The dynamics of the delivery of micro-mobility can therefore offer strong challenges to urban local authorities, both in constructing stable networks, and mobilising public support for its actions. As Geels et al. (2018) observe, the process of radical innovation is more open-ended than for incremental innovations. Policy approaches facing deep uncertainty protect against, and/or prepare for unforeseeable developments, whether it is through resistance (preparing for the worst possible case or future situation), resilience (making sure you can recover quickly), or adaptation (change in policy under changing conditions). Such uncertainty can be hedged in part by learning by firms, consumers, or policy makers (Geels et al., 2018, 37).

3. The Rise of Bicycle Hire

A key element in many micro-mobility systems is to challenge the long dominant culture of motor vehicle ownership and use. In countries in West and North Europe, including the UK, this poses severe challenges for both national and local government, for although the motor vehicle lies at the heart of urban problems of congestion, the environment, and public health, any policy proposal that fundamentally challenges this dominance is likely to face formidable opposition from motoring interests and groups. An implicit element in the tensions between national and local government is for the former to place pressure on the latter to find policy strategies, while also transferring responsibility for confronting and handling motoring interests.

In this context, cycling can offer an attractive alternative that offers effective environmental and health benefits. Politically, governments can promote cycling use, and hope that, over time, motor vehicle users can be persuaded to change their behaviours. Given that only a minority of people, at least initially, are likely to own a bike, bicycle hire can act as an easily accessible bridge to wider cycling use (e.g. Buck et al., 2013). Consequently, over the past two decades bicycle hire has emerged as a rapidly growing mode of transport (e.g. Shaheen et al., 2010, 2011), so that the number of cities offering bike share increased from just a handful in the late 1990s, to over 800 by 2016 (Fishman, 2016). Until 2014, when dockless bicycle hire companies began to operate, bicycle hiring schemes generally involved the bicycle being physically docked and locked in docking stations at appropriate places. These docked systems generally had a more advanced uptake in Europe, with notable systems acting as sources of learning, and inspiring the creation of new systems (Parkes et al., 2013).

In the UK, bicycle hire schemes have developed particularly where the local political climate has been amenable to its introduction and growth (Schwanen, 2015), but more generally cycling has remained relatively weak politically, so that bicycle use has

remained stubbornly at around 2 per cent of total journeys (DfT, 2020, 4). One exception has been in London, where the development of cycling illustrates both the potential and risks in promoting its growth (Goodman et al., 2014). Consequently, in London a bicycle hire scheme has been combined with the development of major cycling ‘super’ highways that, in themselves, strengthened the visibility of cycling as an alternative to car use (Wood et al., 2011). Politically, London Mayor (2008-16) Boris Johnson promoted cycling intensively, so that the cycle hire scheme became known colloquially as ‘Boris Bikes.’ At the same time, the cycle hire scheme remains subsidised, while the cost of the cycling highways has aroused controversy. In addition, in taking space previously allocated to motor vehicles, the cycling super highways have generated opposition from motoring groups (Morton, 2018).

The relatively high capital and subsidy costs of promoting cycling in London can also act as a deterrent to other local authorities that might otherwise be sympathetic to these policies. These doubts can be intensified in periods of economic austerity (e.g. since 2008). In the UK, these austerity problems for local authorities have been particularly acute, as cuts to funding from central government have led to a 17 per cent fall in councils’ real term spending on local public services between 2009-10 and 2018-19 (Institute for Fiscal Studies, 2019, 6-7). However, councils have made even larger cuts to more discretionary areas of spending. These include transport, where expenditure is down 42 per cent in the same period (Institute for Fiscal Studies, 2019, 7). Given these constraints, and the continuing pressures from central government to find workable strategies to long-standing urban transport problems, it was perhaps inevitable that local authorities would search for cheaper alternatives.

4. The Introduction of Dockless Bicycle Hire

Dockless bicycle hire originated in China, with a distinctive business model. As a variation of the more traditional docked bike sharing, dockless bike hire was not essentially new, but takes advantage of modern technologies to offer a more flexible and cheaper option. Typically, dockless bicycles can be tracked and locked using a smart phone app. This means that, unlike an orthodox docked bicycle hiring system, a dockless bicycle can be collected and left at any location, although operators commonly set geographical limits through ‘geo-fencing’, in order to avoid bicycles being left in locations deemed undesirable. Nevertheless, given the inherent character of dockless systems, they are more susceptible to theft and vandalism than the orthodox docked systems (Dudley et al., 2019; Sherriff et al., 2020).

From the outset in China, dockless bike hire was subject to fierce competition. From this intense but unstable environment, two companies, Mobike and ofo, emerged as the principal players. Ofo was launched in 2014, and Mobike in 2015, and both received substantial investment, principally from the Chinese equity companies, Tencent and Alibaba, respectively. However, given the intense competition in their home base, both Mobike and ofo adopted strategies of expanding at a rapid rate by offering subsidised rates, with the result that they made heavy losses. By 2018, it was estimated that Mobike was losing US\$ 50 million per month, and ofo US\$25 million per month (*Financial Times*, 05:04:18).

In recent times, both docked and dockless bicycle hire have mutated in organisational and political terms into wider systems of micro-mobility, that also contain further

recent innovations such as electric bikes and scooters. In turn, different forms and combinations of micro-mobility can be promoted as the appropriate strategies to tackle urban transport problems.

Dockless bicycle hire might have been based on a precarious business model, but for local authorities in the UK it had the attraction of being a means to boost environmentally friendly cycle use at no cost to the public purse. As Nikolaeva et al observe, smartification of cycling is a phenomenon that attracts interest both of stakeholders traditionally interested in cycling as well as new communities, and industries, with potential for new alliances emerging around narratives of new technology, liveability and environmentalism (Nikolaeva et al., 2019, 1).

5. The Bottom-Up Problems of Local Policy Delivery

For urban local authorities, an innovative technology such as dockless bike hire might have appeared an attractive proposition, but it placed them in the hands of private sector venture capital companies which were looking to expand at high speed, and had a different perspective to the public sector in terms of providing strategies for deep-seated and wide-ranging transport problems (see Sherriff et al., 2020). In this context, more needs to be understood about the problems of delivering micro-mobility systems (Dudley, 2013; Smith and Theseira, 2020; Stehlin et al., 2020; Van Den Hurk et al., 2021). Once urban local authorities accept technological solutions, then they are in the hands of the operational practices of the innovators, and if the regulatory authority is weak, then they will be placed in a reactive rather than proactive position.

In the case of dockless bicycle hire in the UK, its public image was significantly shaped by Mobike's first scheme in Europe in Greater Manchester. The Mobike scheme was initially welcomed into Greater Manchester by the Combined Authority, which perceived it as an unsubsidised means to promoting bicycle use in the city. From their perspective, Mobike perceived the scheme as an initial step towards rapid expansion in Europe. However, in the first month of operation, in June 2017, over fifty bikes were vandalised or stolen, often with the lock and GPS tracker broken off, which made it difficult for Mobike to trace them. In the first six months of operation, Mobike wrote off 70 bikes. A number of these were dumped in the city's canals, which created a visible adverse image for the scheme. Basically, the scheme never recovered, and the theft and vandalism continued until Mobike decided to terminate it in September 2018 (Dudley et al., 2019).

For Mobike and ofo, their attempts to expand rapidly in the UK placed a heavy burden on their finances, and financial problems worldwide forced ofo to withdraw from Europe, and subsequently cease business, in 2019. To some extent, Mobike was cushioned by its takeover in 2018 by Meituan Dianping, China's largest online services company, but it was compelled to substantially modify its expansion plans.

The failure of the Greater Manchester scheme made it more difficult for dockless companies to promote their benefits to local authorities, but other companies, including the United States based Lime and Bird to an extent stepped in to continue some degree of momentum, while Mobike maintained a presence. In reality, although dockless bicycle hire may have lost its image as an attractive transport policy

‘strategy the relatively low price and flexibility of the schemes indicated its potential as a micro-mobility system.

For their part, the local authorities lacked any significant legal authority to regulate dockless bike hire. The character of the dockless schemes meant that they did not require any planning permission to commence operation, and although the companies claimed they would not enter any area without permission from the relevant local authorities, the latter were placed in a reactive position. Their difficulties in asserting authority were compounded by the reluctance of the UK government to introduce a statutory regulatory framework for dockless bicycle hire. This was partly attributed by the government to the dominance on the policy agenda of the withdrawal of the UK from the European Union, but it could also be said that the Conservative government was ideologically reluctant to restrict private sector innovation. This was indicated by the government’s 2019 report *Future of Mobility: Urban Strategy*. In the report, the Department for Transport stated that the marketplace for mobility must be open to stimulate innovation and give the best deal to consumers (DfT, 2019, 46). Politically, the government wished to promote an image of the UK being open to entrepreneurial new mobility innovators, and did not seek to hand statutory regulatory authority to the local authorities (see Hopkins and Schwanen 2019, Nixon and Schwanen 2019).

The vacuum left by central government has led to a patchwork of attempts to place some degree of regulatory authority on the dockless operators. These include an accreditation scheme introduced by CoMoUK, the organisation representing the bicycle hire operators themselves (CoMoUK, 2019); a Code of Practice (TfL 2018) introduced by the regulatory authority Transport for London; followed by a more recent attempt to introduce a byelaw regulating dockless bike hire across the 32 London boroughs; the Dockless Bikeshare (Regulation) Bill introduced as a Private Members’ Bill in 2019, but not supported by the government; and a number of codes of conduct introduced by individual cities (including one of our case studies in Oxford).

Dockless bike hire has now passed its peak as a key strategy for urban local authorities in the UK, but it cannot be un-invented, and the experiences gained and lessons learned are likely to influence the treatment of future innovations. In addition, other ‘solutions,’ such as the orthodox docked schemes and e-scooter schemes, can also contain their own delivery problems. More needs to be understood about how local authorities respond to central government policy frameworks with regard to the introduction of micro-mobility innovations; the dynamics of their relationships (or lack of them) with innovators; and how these systems are actually delivered. This is particularly the case where, as in the UK, the local authorities lack the financial resources, and regulatory authority, to assert their power over the innovators.

In this context, we will examine two contrasting case studies. Firstly, the city of Oxford, where dockless bicycle hire was initially welcomed, and four operators introduced schemes. The Oxford dockless bikes experienced some problems of theft and vandalism, together with the effects of the flawed business models of the operators, as described in Section Four. By 2021, all the dockless operators had ceased operation in Oxford. Secondly, the West Midlands Combined Authority decided to exclude dockless operation altogether from its major bike hire scheme (influenced by the experience in Greater Manchester), but the proposed 5,000 bike

docked scheme suffered its own delivery problems. In particular, these concerned compatibility with a new mobility system in the form of integrated public transport ticketing, so that the operator, Nextbike, was dismissed by the Combined Authority in 2019. These comparative case studies allow us to examine both how urban local authorities respond to micro-mobility innovations, and the dynamics and impacts of policy delivery.

In the next section, we will outline the case study selection and the methods. This will be followed by descriptions of the two case studies. In the final section we will analyse what the case studies tell us about the dynamics of the relationships between central government and local authorities, and with innovators and their innovations, and the implications for the introduction of new mobility systems.

6. Case Studies and Methods

As we described in the previous sections, the context for this study is to enhance understanding of how urban local authorities respond to issues associated with the entry of mobility service providers in their jurisdiction, in a context of limited resources, and engagement provided by national government. If public authorities are placed in a subordinate position to the power and independence given to private sector innovators, then what are the outcomes (Docherty et al., 2018)? How do the imbalances in power impact on public value from bike hire schemes (Marsden and Reardon, 2018)? In what ways can the current imbalances in power and the associated networks of relationships be improved?

In this context, the adoption of the case study approach allows us to examine the dynamics of the power balances in a detailed manner, which enables a greater understanding of the character of policy outcomes. As Flyvbjerg concludes, the case study produces the type of context-dependent knowledge which research on learning shows to be necessary to allow people to develop from rule-based beginners to virtuoso experts. Consequently, a scientific discipline without a large number of thoroughly executed case studies is a discipline without systematic production of exemplars (Flyvbjerg, 2006, 219). As Devine observes, power is a complex phenomenon that entails the study of relationships (Devine, 1995, 146), and case studies enable a more profound understanding of these relationships.

The case studies of Oxford and the West Midlands were selected for what we can learn from them with regard to the role of urban local authorities in introducing, delivering, and regulating bicycle hire systems. Unlike Oxford, the West Midlands rejected the innovation of dockless bikes, but both case studies allow us to examine the power balances between the public and private sectors, the character of implementation outcomes, and the lessons that can be learned from these processes.

The study identified and examined relevant official publications, including national and local cycling strategies, and approaches to sharing and micro-mobility. Cycling group publications were also examined, with particular reference to the regulation of docked and dockless bike hiring strategies. Key secondary sources included all published material on docked and dockless bicycle hire for the *Financial Times*, *The Guardian*, and the practitioner journal *Local Transport Today*. These were selected for the range of coverage required, including the business models of the operators, the

political, economic and social impacts, and the case studies themselves. In addition, all the online bicycle hire material was studied for the local daily newspapers the *Oxford Mail*, and the *Birmingham Mail*.

In order to gain an understanding of the underlying dynamics that determined the trajectory of the case studies and also dockless bike hire more generally, twenty interviews were conducted with major stakeholders and those with specialised knowledge (two people were re-interviewed). The interviewees were recruited via two processes. Firstly, those identified as having the closest involvement with the dynamics of the case studies, arising from the primary and secondary sources studied. Secondly, those able to give a wider perspective concerning the development of docked and dockless bicycle hire. This latter process involved an element of ‘snowballing’ to maximise the breadth of contacts. The interviews were all carried out over the phone, during the period April 2019-April 2020. The interviews were semi-structured, not only to give interviewees the opportunity to expand on aspects which seemed important to them, but also to place their experience in a wider personal, institutional, and policy context. As researchers, we sought to ensure distance from the actors concerned by analysing their evidence at all times within the context of the analytical frameworks adopted for the article. Each of the interviews was transcribed, and the transcriptions were then analysed to identify the material that would enhance our understanding of the governance of the introduction and delivery of new mobility systems.

7. Dockless Bicycle Hire in Oxford

The arrival of dockless bicycle hire in Oxford in 2017 represented an opportunity for the city to further develop its policy of establishing and testing technological innovations. In addition, unlike many UK cities, the university city of Oxford has a deep-seated and long-established cycling culture. An indication of this cycling use is that the 2011 UK census showed that 17.1 per cent of journeys to work within Oxford were made by bicycle, up from 14.9 per cent in 2001. This made Oxford second only to Cambridge in terms of the proportion of people cycling to work. In 2017, the government published a *Cycling and Walking Investment Strategy* (DfT, 2017) that stated the objective of making cycling and walking the natural choice for shorter journeys, or as part of a longer journey. In order to seek to achieve these aims, the government committed over £300 million in dedicated cycling and walking programmes. Taking advantage of this new political momentum, Oxfordshire County Council issued an *Active and Healthy Travel Strategy* that aimed to reduce pressure on the road network, contribute to economic growth and the reduction of emissions, enhance quality of life and health, and link active travel with bus and rail options by enabling sustainable door to door journeys combining cycling or walking with public transport (Oxfordshire County Council, 2016). The commitment to cycling has subsequently been maintained, and in its 2020 *Local Cycling and Walking Infrastructure Plan*, the County Council created a new aim to increase both commuter cycling and all cycling in Oxford by 50 per cent by 2031. The County Council acknowledged that in order to achieve these aims there would need to be 25,000 new cyclists (Oxfordshire County Council, 2020).

Nevertheless, the city centre of Oxford is compact, and subject to high levels of traffic congestion, together with associated problems of ambient air quality (a zero emission

zone will be introduced in central Oxford in 2021, with the objective to improve ambient air quality). One strategy for the city that has itself caused problems of congestion and air quality is the promotion of bus use, including an extensive system of park and ride (Dudley, 2003, Parkhurst and Dudley, 2004). Oxfordshire County Council is the highway authority for Oxford, and politically and institutionally has a commitment to the promotion of innovation. These projects include driverless cars being tested on the county's roads, the testing of electric vehicle charging, and exploring new uses for transport data. An innovation and research hub manages the county's participation in projects, and is the largest transport-related innovation team in the UK outside London (*Local Transport Today* 11:05:18).

A technologically innovative cycling strategy to alleviate the city's transport problems, at zero cost to the local authority, was likely to be a particularly attractive proposition for Oxford. For their part, the dockless operators ofo and Mobike made Oxford one of their key early targets. However, in delivering the dockless schemes, despite its institutional strength in innovation, the County Council was dependent on private sector companies with highly ambitious expansion plans, but also operating on tight and fragile profit margins. As we noted above, there was no statutory framework for the regulation of dockless bikes, and local authorities had no powers to prevent their introduction. In Oxfordshire's case, their answer was to construct a Code of Conduct for the operators that could provide a voluntary regulatory framework. The County and City Councils co-operated on constructing the Code of Conduct, and also involved the Oxford Cycling Forum, a body created by the City Council, and including cycling groups, the universities, railway companies, cycle shops, and local councillors. A sub-group was created to write the Code of Conduct, and sought to build a good working relationship with operators:

The Code of Conduct itself included agreement over the numbers of bikes, the safety and maintenance of the bikes, avoidance of obstructive parking, and use of data. There was also provision for the operator to pay the Oxford Living Wage (Oxfordshire County Council, 2017). For their part, the dockless operators were amenable to agreeing to the Code and to work with the local authorities. Despite the good intentions, however, the framework constructed by the Code of Conduct could be overtaken by events, and the Code had no provision for legal enforcement.

Ofo commenced operation in Oxford in August 2017, and were quickly followed by Obike, Pony (a local operator), and then Mobike in October 2017. Each company began with 100 bikes, but from the outset there were complaints of bikes being dumped in places that blocked pavements and looked unsightly. Although the vandalism and dumping of bikes was not on the scale of the failed Mobike scheme in Greater Manchester, the misuse of bikes was given wide publicity in the local media and created a negative image for dockless bike hire. Nevertheless, the local authorities were committed to encouraging the innovation, and supported the rapid expansion of the operators, so that by April 2018 there were over 1,300 dockless bikes in Oxford (*Oxford Mail* 28:03:18). The rapid increase in the numbers of the bikes caused political controversy, with the County and City Councils continuing to defend the operators, but a Liberal Democrat city councillor accused the Labour Party led Oxford City Council of letting multi-national companies in with no real control, and claimed that the Code of Conduct had no teeth (*Oxford Mail* 05:05:18). In this context, an

Oxford cycling group official expresses doubts about how the dockless operators were given the freedom to expand:

“Until the dockless operators came along, it had never occurred to me that a dockless company could just dump bikes, with no real control. I find it stunning that there is no legislation that covers this. I think there should be some responsibility on the owners of these bikes to stop them obstructing pavements.”

(Interview, Oxford cycling group official)

An Oxfordshire county councillor with cycling responsibilities concedes that the Code of Conduct had a limited impact:

“The Code of Conduct worked for a period of time, but the problem was too many operators in a short period of time. Their margins were very tight, and we should have been able to issue operator licences, and ideally form partnerships with the local authorities, with a clear agreement about the location and numbers of bikes... there wasn't a commitment from the operators to adhere to the regulatory framework.”

(Interview, Oxfordshire county councillor)

Notwithstanding the initially receptive attitude to the introduction of dockless bicycle hire, an Oxford city councillor explains that the problems with dumped bikes caused tensions with the operators:

“We did have to pick up quite a few abandoned bikes. The parks and refuse teams had to recover them. If we'd had more regulatory control, we would have set up an agreement, so that every time we picked up a bike, we could charge the operator a fee. At the outset, the operators were responsive, and had a lot of people on the ground, but as their finances tightened, so the collecting of bikes became more patchy.”

(Interview, Oxford city councillor)

Further controversy involving the dockless operators occurred in August 2018 when the city's largest docked bike hire operator, Oxonbike, shut down, with the operator Hourbike blaming the increase in dockless operators as the principal reason for its demise (*Oxford Mail* 07:08:18). In response, a manager of an Oxford dockless operator argues that, with the docking stations, the costs of docked operators are high, and that dockless bike hire offers greater flexibility to the user, at a cheaper cost (interview, manager of Oxford dockless operator). Nevertheless, Oxonbike had strong institutional support, and was subsidised by the University of Oxford, and the local hospital trust. In 2019 Oxonbike was revived with a new operator, which included a number of electric bikes, which it was hoped would widen the demand for the scheme.

After the expansion in the earlier part of 2018, as the year progressed so the limitations of the business models of the dockless operators became more evident. In particular, ofo as a company suffered severe financial difficulties, and in January 2019 ceased business. In Oxford, both Pony and Obike ceased operations later in the year, and although Mobike remained, it too withdrew its bikes in 2021. Instead, the local

authorities have sanctioned a pilot scheme using e-scooters. In 2017, dockless bicycle hire had emerged as a micro-mobility strategy to tackle Oxford's serious transport problems, but by 2021, the weaknesses in the business models of the private sector operators, together with the voluntary character of the Code of Conduct, meant that the delivery process was terminated.

8. The West Midlands Bikeshare Scheme

Unlike the city of Oxford, there is no strong cycling culture within the area of the West Midlands. For example, in 2019, 11.6 per cent of people cycled once a month, and 8 per cent once a week, compared with national averages of 16.9 per cent and 11.9 per cent respectively. (West Midlands Combined Authority, 2019).

Nevertheless, the West Midlands, particularly in the largest city of Birmingham, suffers high levels of traffic congestion and poor air quality, so that there was a political and environmental impetus to find new 'solutions' to these problems. Led particularly by Birmingham City Council, there was focus on the role of cycling, and in 2015 the executive body, Transport for the West Midlands (TfWM) produced a Cycling Charter that set a goal to achieve a regional average of 5 per cent mode share for cycling by 2023, and 10 per cent mode share by 2033. This compared with a West Midlands journey to work mode share for cycling of 1.7 per cent in the UK 2011 census. The Cycling Charter also had an ambition to secure sustainable annual funding equivalent to an investment of £10 per head (at 2014 prices) compared to an existing level of 25p per head (TfWM, 2015). This ambition reflected an acknowledgement that improving mode share for cycling would require large-scale investment. In 2015, the UK government had promised funding in cycling of £300 million in the next five years, but there were no guarantees that a large area such as the West Midlands would receive the necessary funding.

In the West Midlands, therefore, there were ambitious targets to make cycling a key strategy to solve major transport and environmental problems, but still little in terms of actual plans and the necessary investment. In addition, politically and administratively, the West Midlands was inherently fragmented, and comprised the seven local authorities of Birmingham, Coventry, Dudley, Sandwell, Solihull, Walsall, and Wolverhampton. In 2016, however, the West Midlands metropolitan county was created as the regional planning authority, with a population of 2.8 million. Although the seven local authorities remained in place, the new Combined Authority had the powers to introduce and implement major investment plans in areas such as transport, and a strategic transport plan was published (West Midlands Combined Authority, 2016). Further executive authority was added with the election in 2017 of the first West Midlands mayor, the Conservative Andy Street.

It was Street who acted as the policy entrepreneur in the form of a major bike hiring scheme for the region. In his election manifesto, Street committed himself to the existing targets of £10 per head cycling spending, and 5 per cent modal share by 2023. Although initially Street expressed doubts about a bike hire scheme, by October 2017 plans were announced for a West Midlands Bikeshare scheme. A TfWM cycling manager describes the process that brought the scheme about:

“The Bikeshare scheme was based on the Cycling Charter, and we produced an Action Plan with the seven local authorities. We got a working group together, and a feasibility study was produced by consultants. This study considered how many bikes would be needed, and the relative merits of docked and dockless bikes”

(Interview, TfWM cycling manager)

Crucially, the feasibility study rejected the prospect of dockless bikes, on the grounds that they were still in the very early stages of development in Europe, and had implications for the street scene and cycling crime, including cluttering (*Birmingham Mail* 11:10:17). A TfWM cycling manager also acknowledges that the negative experience with the major scheme in Greater Manchester was an influence on the decision to exclude dockless bikes (interview, TfWM cycling manager).

The scheme was therefore to comprise entirely docked bikes, and a minimum number of 3,000 was stipulated, although provision was made for the possible introduction of electric bikes, and a hybrid scheme that could include an element of dockless bikes. The operator would also be required to integrate the Bikeshare scheme with the West Midlands SWIFT smart public transport ticketing system. In the light of later events, a key decision was made that the scheme would have no public funding, and the operator who won the concession would be required to find a sponsor. As in Oxford, therefore, although the West Midlands Combined Authority had rejected the system of dockless bike hire, the local authority would be in the hands of a private sector operator to deliver a scheme at zero cost to the public purse.

The bicycle hire company Nextbike was awarded a five-year contract. The company operated 200 schemes, with 8 in the UK. All of these UK schemes were for docked bikes, although Nextbike operated some dockless schemes in the rest of Europe. Although the specification had referred to a target of 3,000 bikes, Nextbike made the decision to deliver a scheme of up to 5,000 bikes across the West Midlands region. The annual cost to the user would be £50, but SWIFT card members would be able to access the bikes as part of their regular subscription.

The contract was awarded in 2018, and it was intended that the 5,000 bikes would be delivered in three phases by the Spring of 2019, but it soon became apparent that this target would not be attainable. In the event, the only element of the scheme to actually be delivered by Nextbike arrived in February 2019 with a 25 bike pilot, with 5 docking stations, in Wolverhampton city centre. Five months later, in July 2019, West Midlands mayor Andy Street announced that the contract with Nextbike had been terminated. In response, Nextbike claimed that they had spent more than £700,000 in attempting to implement the scheme, with particular emphasis on integration with the SWIFT public transport ticketing system (*Local Transport Today* 02:08:18). A Nextbike manager argues that the crucial problem was one of funding:

“The fundamental issue was that the Combined Authority didn’t put any money into it, and so it was a zero feed tender...we had an indication from a sponsor that they would put money into it, and we made a bid on that assumption. Unfortunately, it was a wrong assumption, and the sponsor didn’t come through.”

(Interview, Nextbike manager)

In terms of scheme delivery, the Nextbike manager claims that their IT team spent a lot of unfunded time on attempting to integrate the SWIFT card, but that there were operational problems with the card itself. A further major stumbling block was that, with regard to designing and placing the bike stations, there were different expectations that made up the seven constituent local authorities, and that the Combined Authority needed to co-ordinate and simplify these requirements (interview, Nextbike manager).

For their part, a TfWM cycling manager argues that Nextbike were over ambitious:

“Nextbike bit off more than they could chew. They didn’t have the capabilities to deal with the complex situation required. They weren’t able to deliver the sponsorship they had promised to make the scheme financially viable, and didn’t understand what they had let themselves into.”

(Interview, TfWM cycling manager)

With regard to the re-tendered scheme, crucially the Combined Authority has decided to take greater responsibility for delivery. Consequently, the Authority will control the assets, and buy the bikes and docking stations. The number of bikes is considerably reduced from the Nextbike scheme (and the original Combined Authority target), with 1,500 bikes, including a minimum of 10 per cent electric bikes. Dockless bikes are still rejected although, in a separate initiative, the Combined Authority has commissioned a dockless electric scooter hire scheme. The contract with the Bikeshare operator will therefore be a service agreement rather than a concession, with the operator being paid a monthly fee to manage the bikes. The Combined Authority will also take responsibility for finding a sponsor, although it is highly significant that, unlike the earlier scheme, the scheme will be subsidised with public money. Consequently, the West Midlands Combined Authority will contribute £15.8 million over five years to support the scheme (West Midlands Combined Authority, 2020). Integration with the SWIFT card has also been modified, with this designed to take place in phased stages (interview, TfWM cycling manager). In 2021, Serco was awarded a five-year operating contract for the scheme, with three possible one-year extensions.

The Combined Authority rejected the strategy of dockless bikes, but as in Oxford, encountered insurmountable obstacles in policy delivery with a private sector operator unable to deliver the scheme promised. In the West Midlands case, it was the failure to integrate the Bikeshare scheme with the new mobility SWIFT system that represented a key delivery failure. In both cases, the attraction of a major strategy at zero cost to the public purse proved an elusive goal. The response by the West Midlands mayor and Combined Authority is to attempt to reduce uncertainty by taking delivery into their own hands. At the same time, this places new emphasis on the Combined Authority and TfWM possessing the expertise and financial resources to deliver the scheme. In turn, there is greater political pressure on the Combined Authority to ensure a successful outcome.

9. Discussion and Conclusions

The aim of the paper was to enhance understanding of how urban local authorities respond to issues associated with the entry of mobility service providers in their jurisdiction. This is in a context of limited resources, and engagement provided by national government. This aim was driven by basic questions about the role taken by the state within these networks, to steer, facilitate, but also possibly reject mobility strategies.

There are trends towards seeking to constrain the authority and resources of the state, and to rely on private sector innovators to provide the technological and management expertise to implement the necessary mobility strategies. These trends can leave an imbalance of authority and resources that creates significant gaps when innovations fail to produce the hoped for outcomes. In turn, counter pressures arise to construct governance systems that allow local authorities a higher level of regulatory authority and financial resources in order to hold a more equal balance of power with the private sector innovators.

The aims of the paper were examined from the perspective of two UK case studies of bicycle hire implementation. In both case studies, significant weaknesses were exposed in the implementation processes that resulted in scheme failure. In the case of dockless bicycles in Oxford, the County Council as the highway authority was dependent for implementation on private sector companies with highly ambitious expansion plans, but also operating on tight and fragile profit margins. A Code of Conduct was constructed that could provide a voluntary regulatory framework. Despite good intentions, the framework constructed by the Code of Conduct could be overtaken by events, and the Code had no provision for legal enforcement. This led to collection problems, with dumped bikes, while the business models of the dockless operators proved fragile, so that by 2021 all four of the original operators had ceased operation.

In the case of the West Midlands, the 2015 Cycling Charter set an ambitious goal to achieve a regional average of five per cent mode share for cycling by 2023, and 10 per cent mode share by 2033. This compared with a West Midlands journey to work mode share for cycling of 1.7 per cent in the UK 2011 census. The creation of a West Midlands Metropolitan County in 2016, and the election of the first West Midlands mayor in 2017, provided the political window of opportunity for a West Midlands Bikeshare scheme. Dockless bikes were rejected for the scheme on the grounds that they were operationally unproven, and a target of 3,000 docked bikes was specified. In the event, the appointed operator made the decision to deliver a scheme of up to 5,000 bikes. Crucially, no public funding was attached to the scheme.

As in the case of Oxford, the local authority was placed in the hands of the operator, with little of its own expertise, financial resources, or regulatory authority attached to the scheme. The operator Nextbike's failure to deliver the scheme exposed the local authority's inability to exert any degree of public supervision. Its response in the revised scheme is to own the bikes and operate a service agreement with the operator, rather than the earlier model of a concession. The revised scheme will also receive a public subsidy.

Both case studies demonstrate the tension between disconnecting the local authority from a scheme operator, and the governance void that is left when bike share schemes

go wrong. A more equitable distribution of costs and risks is required, in which the local authorities and the innovators share the responsibility for scheme success or failure. Similarly, while statutory regulatory frameworks are required in a sector such as bicycle hire, it is important that partnerships are developed between the local authorities and the innovators. Both parties need each other, and as the case of dockless bike hire demonstrates, there is no clear demarcation between the public and private sectors in delivering schemes.

At the same time, effective partnerships depend on the local authorities having the necessary financial resources and expertise to build a relationship with innovators based on the local authority being in a position to effectively monitor and regulate the innovator. In top-down terms, central government did not allow the local authorities the necessary finance and authority to act, and this gap had fatal consequences for both case studies. For their part, innovators such as the dockless bike hire operators had defective business models, which placed excessive reliance on raising large sums of venture capital, with the aim of maximising market share in the minimum amount of time. There was a major lack of social and environmental responsibility, with free riding, by means of leaving others to clear up after them. These conditions are not good for the development of trust and partnership, and emphasise the need for statutory regulatory control that places firmer and wider responsibilities on the operators.

In a wider sense, the need for local authorities to deliver on environmental, community, and public health objectives, means that bike hire schemes cannot be planned and implemented in isolation. Integration with other services, such as ticketing systems, is one dimension, but there is also a need for both docked and dockless schemes to be given the necessary priorities in terms of space allocation as part of the urban planning agenda. This in turn heightens the need for urban local authorities and innovators to work in partnership in order to facilitate the attainment of these wider objectives.

Much emphasis is now placed on a range of new technologies being integrated to become Mobility-as-a-Service (MaaS) systems, but the case studies in this paper illustrate that there can be serious obstacles in achieving these fully integrated systems. As Pagoni et al. (2020) emphasise, obstacles to MaaS implementation include technical, regulatory, financial, and social issues. It remains uncertain how effective the current MaaS policies will be in terms of facilitating the development and diffusion of MaaS that generate public value (Smith and Hensher, 2020). There is also the impact that new technologies have on wider issues, and much needs to be understood about the impact on such issues as equity, employment, and social issues (Smith and Theseira, 2020). The formation of new technology platforms can entail major issues of infrastructure organisation, spatial formation, and governance (Stehlin et al., 2020), and can involve difficult decisions when competing interests come to the fore (Van Den Hurk et al., 2021).

There has been a considerable effort among local authorities in many UK cities to give greater priority to cycling, and many ‘pop-up’ cycle lanes were introduced during the pandemic, often with little consultation and forethought. There has also been considerable encouragement for the private sector to ‘flood’ the market with bike hire schemes, many of which have been dockless. But, as illustrated in the two

case studies, the outcomes have been disappointing with frustration on the part of the local authorities, the bike hire companies, and the potential users of the schemes. Two main conclusions can be drawn from this experience.

First, there needs to be much greater partnership and consultation between all parties, and engagement with the public before any scheme is introduced, and during its initial (and subsequent) implementation. The current dominance of supply led solutions do not work, as the large numbers of bikes promised do not materialise, and the market needs to be better understood, perhaps through careful segmentation targeting the users with the greatest potential in the initial stages.

Second, bike hire schemes should be seen as part of the wider provision of integrated micro-mobility schemes, with common ticketing, information, provision of cycleways, and other rights of way. This means providing a more comprehensive framework for cycling as an 'equal' partner in the provision of transport services by the local authority, including mobility-as-a-service. This in turn means a clearer division of responsibilities between the public and private sectors, and the need for regulation of operators and operations. There is also the question of who the schemes and services are provided for, and the extent to which they serve objectives of distributional justice.

There are clear methodological limitations with our study, given that there are only two case studies. This clearly raises questions about the degree to which the findings can be generalised, and more research is needed to test how typical the relationships described here are between local authorities and operators. In particular, are there similar imbalances in power, and what are the impacts of the lack of expertise and financial resources for the local authorities? Nevertheless, as Flyvbjerg concludes, often it is not desirable to summarize and generalize case studies. Good studies should be read as narratives in their entirety (Flyvbjerg, 2006, 241). In this context, the case studies in this paper attempt to illustrate some of the key questions arising from the regulation of bicycle hire schemes. As Shaheen and Cohen observe in their policy toolkit for shared micro-mobility, it is clear that these innovative technologies will likely have a disruptive impact on traditional notions of curb space planning and design. Thoughtful planning, continued research, and an understanding of micro-mobility's impacts will be important to balance public goals with commercial interests, and to harness and maximise the social and environmental benefits of these innovative transportation modes (Shaheen and Cohen, 2019, 25).

The UK has never had a strong cycling culture such as that found in many other European countries and globally. There is a general acceptance that more cycling is good for transport, good for health, good for cities, and good for the planet, but unless innovation is supported by the full involvement of all parties, and a light but clear regulatory framework, the substantial increases in cycling seen during the last year will not become a significant feature of the UK mobility scene.

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