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E-Scooters: A New Smart Mobility Option? The Case of Brisbane, Australia

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Abstract

Standing electric scooters (e-scooters)' rapid infiltration as a mobility option has left cities in the limbo of having to deal with regulation and planning for their sudden interruption. As the first city in Australia to allow e-scooter sharing, Brisbane is at the forefront of regulating their use in public space. We reflect on how e-scooter governance can be considered a continually (re) negotiated site of state-market interface, drawing insights from Lindblom's science of muddling through, Dewey's socially organised intelligence, and Leitner, Peck, and Sheppard's discussion on contesting market domination/ modes of social regulation.

Introduction

In late 2017, standing electric scooters (e-scooters) were deployed by the company Bird in Santa Monica, California, the first city in the world to experience e-scooter sharing. It was a huge success; e-scooters' portability and their dockless deployment – offering easy and effortless travel around the city – were eagerly embraced by the public. By late 2019, Santa Monica arguably became the world capital of micro-mobility, with 2,000 e-scooters together with 500 e-bikes operated by four different private companies (Linton, 2019; Short, 2019; Sisson, 2018). Dockless e-scooter sharing since then has been exported to cities around the

globe. Lime scooter and bike sharing services are now present in over 100 cities (Neutron Holdings Inc, 2019) and their rapid infiltration into different international contexts has been noteworthy. Within two weeks of officially launching, more than 50,000 e-scooter rides occurred in Brisbane (Queensland, Australia) (Booker, 2018). At first glance, the arrival of e-scooters seems rather promising: in addition to offering another choice of transport, they have the potential to alleviate congestion (through reduced automobile dependency) as well as increase accessibility in cities, both geographically and socially (Weiss et al., 2015).

While the buzz around e-scooters has been evident, the impacts and policy implications of introducing e-scooters remain under-researched. Several scholars have noted the difficulty of governing the so-called ‘smart mobility transition’, particularly because of the increasing role of the private sector in leading mobility technologies and hastily presenting them as ultimate ‘smart’ solutions (Stone et al., 2018). Their disruptive nature and the resulting uncertainty around the role of government has been a common theme in urban transportation studies (Docherty et al., 2018; Maginn et al., 2018; Stone et al., 2018), and yet there has been a lack of research on how the introduction of micro-mobilities can be considered as a contested arena in which state-market relation is continually negotiated. We believe that, given the current status quo of market-driven spatial developments, the question of delineating the state-market interface (as it appears in e-scooter governance) is a more central problem that many authors studying ‘technological disruptions’ have yet to articulate.

Our findings highlight that practitioners struggle with new mobility technologies popping up in urban landscapes without notice, and that the government is often left trying to catch up with what is already happening and the unknown of what is to come. Considering the e-scooter phenomenon as an opportunity to concretise how planning balances the competing/contradictory interests of public and private, we locate ‘e-scooter governance’ within existing public policy debates, including Lindblom’s science of muddling through, Dewey’s socially organised intelligence, and Leitner, Peck, and Sheppard’s discussion on contesting market domination/modes of social regulation. Ultimately, the paper highlights the necessity for planning to continually (re)negotiate the state-market relation as the opportunity arises through specific substantive developments – which, in our case, is the introduction of e-scooters in cities.

Research Site and Methods

We used content analysis and interviews as the main methods of our research. The data for content analysis came broadly from three different sources: policy documents, media contents and council meeting minutes. In the first phase of research, we focused on identifying factors of success and failure by examining policy documents of international cases. In the second phase of the research, we focused on analysing media contents and council meeting minutes, as well as overviewing policy documents specifically on the case of Brisbane. Brisbane was the first city in Australia to take on a trial run by Lime in collaboration with the city government and Queensland State Government – presenting an opportunity to see how e-scooters can be used, regulated and managed in an Australian city. We examined 53 newspaper articles and 26 council meeting minutes in order to capture a recent picture of the e-scooter situation in Brisbane (See Appendix 1 and Appendix 2). Additionally, we interviewed key planning and built environment practitioners in Brisbane, in order to consult with them on what they think of the introduction of e-scooters in the city landscape, their planned strategies to work with/around e-scooters, and the specific challenges they are facing (see Appendix 3). Eight interview participants were selected by reaching out to practitioners in the fields of transport planning and advocacy, urban planning, urban design and traffic engineering in the Brisbane area. Data gathered through the policy documents, media contents and interview transcripts were analysed through identifying key themes that were inductively built up one-by-one as we went through the documents (see Figure 1). We used a ‘grounded theory’ approach that ‘invokes iterative strategies of going back and forth between data and analysis’ in a way that keeps the researcher interacting and involved with their data and emerging analysis (Charmaz, 2006, p. 1). At the same time, we did not purely rely on numbers or the count of themes when discussing the results. In other words, the frequency (at which a theme was referred to) itself was not the sole standard of deeper engagement in our discussion. Rather, we assessed these emerging themes in light of the existing literature and international experiences on e-scooter governance, so as to tell a more coherent story of what is currently at stake, while drawing its wider implications on planning research.

Literature Review: Shared Mobility and Technological Disruption in Urban Landscapes

A key facet of the ‘smart’ shift in transport is ‘shared mobility’, which has resulted from mainstream use of GPS-harnessing mobile apps together with the rise of the sharing economy and changing notions around ownership. Various arrangements of car, ride and bike share are typical examples of these service markets (Maginn et al., 2018), including ride-hailing mobile apps (e.g. Uber, Didi, Ola) or bike sharing platforms (e.g. Lime Bikes, Ofo). Advances in GPS technology and the widespread use of smartphones are considered as main reasons for the recent rapid growth of shared mobility services, as they facilitated our ability to access them on-demand (Liyanage et al., 2019).

However, the arrival of shared mobility also bears substantial governance challenges (Rauch & Schleicher, 2015). First, since shared mobility services are typically run by private operators, the sharing models are most likely to be driven by profit maximisation ahead of public good factors such as safety or strengthening a sense of community (Maginn et al., 2018). This could potentially result in questions around equity, particularly relating to access to these services by low income or other minority groups, remaining unanswered (Piracha et al., 2019; Brown, 2019, p. 264). Secondly, if the goal of sharing is to maximise financial returns, the market would always encourage ‘more mobility not less’ (Docherty et al., 2018, p. 115), which may result in issues of ‘oversharing’ (Zuev et al., 2019, p. 20) and a potential disregard for public safety. While there is obviously an existing conflict over sharing the road as public space (Litman, 2013), the increasing popularity of divergent shared mobility devices has exacerbated these tensions.

But perhaps the most critical aspect of governing shared mobility – that is particularly relevant to e-scooters – would be the discussions on its disruptive nature, tied with the rapid advancements in technological solutions and innovations that are often deemed to be inherently positive (Dudley et al., 2017). Several scholars frame the main governance challenge for smart cities and smart mobility as a grappling between urban problems and technological solutions (Albino et al., 2015; Dia, 2017; Finger & Audouin, 2019; Legacy et al., 2019; Meyer & Shaheen, 2017; Papa & Lauwers, 2015). Especially in transportation planning, there is seemingly an unwavering belief in technical or engineered solutions, where people often mistakenly conflate technology and innovation (Edgerton, 1999; Moraglio, 2018). Hence, it has been pointed out that while technical solutions may sometimes present a promising breakthrough, they are not absolute answers unless technology is integrated with

social innovation, sustainability, and a broader cultural shift (Papa & Lauwers, 2015). In other words, innovation may use these technological advancements in new ways, but without coordinated vision and planning, it is only ‘a means, not an end’ (ibid., pp. 545–550).

Consequently, city governments and planners now face pressing challenges of coping with the mushrooming technologies in a swift manner. Most of these challenges relate to managing and regulating the private sector appetite for efficiency and profit maximisation that often dilutes the true meaning of ‘smart mobility’ – that which enhances quality of life and public value (Papa & Lauwers, 2015). As a result of the private sector leading and redirecting planning priorities (Levinson & King, 2019) – in the name of ‘innovation’, ‘development’ and ‘progress’ – the role of government is also shifting from directly providing services to managing and coordinating them, ultimately in order to protect public interest in a complex web of service provision (Harvey, 1989). This is particularly apparent in the Australian context of a neoliberal paradigm and an increasing private sector presence in the provision of transport (Stone et al., 2018). On a more pragmatic note, however, technical reports such as ‘Private Mobility, Public Interest: How public agencies can work with emerging mobility providers’ (TransitCenter, 2016) have provided a set of recommendations for local governments that try to balance market dominance with public interests – especially through leveraging ‘agency-controlled assets’. These assets include inter alia public roads, trails and bicycle docks that private mobility providers can’t operate without. The aim of this leveraging is to facilitate certain desired outcomes for public interests such as requiring private companies to share trip data or to contribute to an infrastructure fund.

The shared e-scooter operations allow us to reflect on (a) how technological disruption is physically affecting everyday experiences of the urban landscape (James et al., 2019), (b) how such disruption can result in negative consequences of private sector-driven developments that sacrifice public safety and equity, and thus, (c) what kind of interventions planners can make within a limited time window. Recent academic research has contributed to debunking prejudices that have arisen with the sudden appearance of e-scooters: e-scooter parking does not necessarily impede street access, at least not more than already-existing car parking or ride-hail services (Brown et al., 2020). Further, e-scooters possess the potential to substitute car-dependent trips (James et al., 2019). While the inevitability and potential promise of welcoming e-scooters as a new mobility option has been highlighted, there have

been a lack of empirical studies on how planners/ built environment practitioners cope with these emerging technologies. More importantly, the existing research has yet to situate the regulation of e-scooters within a broader context of governance literature. Using the case of Brisbane's recent trialling of e-scooters as a new mode of transport, the objective of our research was not only to explore what kinds of policies and regulations are being tested in different cities, but also to demonstrate e-scooter governance as a contested interface of constantly recalibrating public and private interests. To do so, we interpret our findings in light of the existing public policy debates (on incrementalism, organised social intelligence, and regulation theory) – on which we elaborate further in the Discussion section.

E-scooter Governance: Lessons from International Cities

In order to better understand what kinds of governmental interventions have been tested and proved ideal for e-scooter governance, we surveyed how other international cities are managing the deployment of these devices (see Table 1). Following a broad review of several e-scooter cities around the world, a handful of cities – Santa Monica, San Francisco, Paris, Berlin and Auckland – were selected for inclusion in the paper due to being early adopters of shared e-scooter services or for their specific policies that have proved to be useful. Early adopters have a longer history and development of e-scooter sharing policy and regulation, which was the rationale behind our initial case selection. Seattle was added later in the list for adopting a comprehensive range of new strategies. Being one of the latest cities to legalise shared e-scooter operation (finalised in August 2020), Seattle has learned from past experiences of other cities and deployed the kinds of regulation inspired by these 'lessons learned' (Seattle Department of Transportation [SDOT], 2019).

Agreements between Government and Private Operators

How does it all begin? We looked at different trajectories of how the shared e-scooters are launched in a new city, focusing on agreements made between government and private operators. The introduction of shared e-scooter platforms has typically begun with a sudden appearance of scooters. City governments and transportation agencies then hurriedly develop strategies to cope with them, through a trial period or a 'pilot program'. With such programs,

particular e-scooter companies are awarded the right to operate via a competitive tender process. For instance, when scooters were ‘dropped’ by the company Bird overnight (in late 2017), the City of Santa Monica grappled with the chaos and the potential benefits (see Yakowicz, 2019). Over the following months, the city chose to facilitate a pilot program through ‘administrative regulations’. These regulations were essentially subject to amendment at any point in time if deemed necessary – allowing the city council the flexibility and authority to change elements of the program as new data comes to light (City of Santa Monica, 2019a). For example, the council reduced Bird’s fleet size (i.e. the number of scooters that are allowed to be circulated) from 750 to 500 in July 2019, following a high number of complaints as well as observed operational problems (Martin, 2019). Bird submitted a request to increase their fleet to 900 after responding to these issues and receiving a high customer demand. Acknowledging general improvements, and yet a lack of adherence to their fleet cap, the city allowed Bird to return to operating 750 e-scooters. As such, the flexibility in caps on e-scooter numbers in total and per operator can be useful in adjusting supply to meet demand as well as incentivising good operator behaviour.

Auckland followed a similar trajectory: e-scooters appeared in the city overnight, and the city officials facilitated its legalisation process as soon as possible – adjusting regulations bit by bit on a trial basis. Auckland Council’s Director of Regulatory Services, Craig Hobbs has said that: ‘We’ve been confronted with the rapid emergence of a new mode of micro-mobility. . . . We’ve gone from barely having heard of e-scooters to having ride share schemes and private e-scooters on our streets. As a result, we had to get up to speed quite quickly in order to develop responsible decision-making processes around licensing ride share operators.’ (Auckland Council, 2019a; see also, 2019b, 2020; New Zealand Transportation Agency, 2020).

In San Francisco, on the other hand, e-scooter sharing was off to a rockier start. The city banned the devices shortly after they were deployed by private companies in the early months of 2018. Since then, the San Francisco County Transportation Authority (the main transportation authority in the city-region) has worked closely with the San Francisco Municipal Transportation Agency (SFMTA) and other public and private partners to better understand this emerging mobility and its impact on the city. To ensure a balanced distribution of scooters in San Francisco, new private operators were selected after a year-

long trial. The operators are subject to following specific distribution requirements in designated services areas (SFMTA, 2019).

Seattle went even further than San Francisco in its regulatory approach. The city banned e-scooters on its streets almost for two years under the mayor's direction that they were unsafe.¹ This 'taking it slow' approach to e-scooter sharing was met with surprise, given that Seattle was one of the first cities to legalise dockless bike sharing in 2017 (Gutman, 2018). Despite Lime's continuous appeal to the irreversibility of this global trend (of e-scooters) – that they are safely operating in more than 100 cities – Seattle made the decision to pace its introduction and roll out public engagement plans as it saw fit: 'We will work with stakeholders like our transit, pedestrian and bike oversight boards, disability rights groups, local businesses and transit partners to develop the framework of a scooter pilot for Seattle. We will continue to listen and learn from other cities. We also want to hear from our neighbourhoods' (Mayor Jenny Durkan, 2019). In 2019, Seattle conducted public outreach and engagement programs, convening detailed ideas on riding location, parking, overall safety, education/enforcement, and equity/accessibility; public feedback was received through surveys and open comment, in addition to several stakeholder meetings and an environmental review (SDOT, 2019). After this lengthy public deliberation and community engagement process, it finally launched a trial period in August 2020 (SDOT, 2020a) with a detailed set of regulations summarised in Table 1.

In contrast to this level of strict municipal control, the situation in Paris is seen to have developed largely unencumbered by governmental regulations. With no restriction on number of operators or scooter fleet sizes, the city was believed to have around 20,000 scooters in action operated by twelve private companies in summer 2019, starting from June 2018 when they first appeared in the streets of Paris (Halais, 2019). Eventually, such a scene was viewed as an 'invasion' by residents (Crellin, 2019). Responding to this, the city later attempted to regulate the number of scooters through imposing monetary duties on their operators. The city introduced a requirement for shared e-scooter companies to pay a fee of fifty euros per scooter and sixty-five euros if they operate more than 3,000. Berlin, Germany has also adopted a relatively laissez-faire approach up until now, not imposing any restrictions on number of providers or their fleet sizes. However, the Berlin Road Act is currently being redrafted and, if the changes are approved, the government would be able to regulate shared e-scooters and shared vehicles (e.g. make companies tender to operate, place

a cap on fleet size, require the companies to locate a certain percentage of their fleet in the outskirts of the city where reliance on the car is higher) (Latz, 2020).

Leveraging Regulatory Control for Advancing Social Equity

Agreements between government and private operators can go beyond the number of scooters or the length of permits/contracts. They can also include further governmental interventions driven by public interests, such as equity or environmental sustainability concerns. In an attempt to achieve equity goals, San Francisco will require a minimum number of scooters to be consistently deployed by operators especially in ‘communities of concern’ – meaning historically disadvantaged or economically challenged neighbourhoods. Noting the survey data from the pilot program in San Francisco – which revealed most scooter users to be white, upper middle-class, and male – the city has highlighted the importance of equity and outreach, requiring operators to develop local strategies on safety, culture, and neighbourhood needs. Going further, the city has claimed that there will also be new guidelines relating to environmental sustainability, requiring operators to undertake a life-cycle analysis of their devices. San Francisco Municipal Transportation Agency (SFMTA) acknowledges their role and authority in monitoring the operation of permittees in light of these new conditions.

Following a spike in ridership in Portland in the context of COVID-19, Seattle recognised the potential of this shared mode to contribute to achieving equity goals, including access to mobility² (SDOT, 2020b). Learning from the research of neighbouring cities whose results were similar to that of San Francisco’s (that e-scooter users are most likely to be white, high-income males) Seattle implemented regulations allowing for reduced-rate plans for low-income communities, providing access to those who lack a mobile smart phone, bank account or credit card. Seattle also requires scooter share companies to make at least 10% of their fleet available in neighbourhoods with a higher proportion of communities of colour, immigrants, refugees, people with low incomes, and limited English-proficient individuals. Harnessing the regulatory power of the public sector, cities can negotiate terms and conditions year by year and penalise operators who don’t meet these standards.

Public Awareness and Policy Implementation Challenges

Although cities often end up establishing rules on e-scooter use, it seems that executing these regulations is a different story. Especially in the cities and suburbs of California, where density is relatively low and urban sprawl is more or less the norm, ‘spot fines’ are difficult to implement in reality. While Santa Monica has published rules and guidance for riding scooters on their city council website, it seems that public awareness of these regulations falls short. According to a survey asking respondents about their familiarity with rules (as well as where they actually ride the scooters), scooter users have shown a lack of understanding and disregard for regulations (City of Santa Monica, 2019b).

As a technical solution to enforcing regulations, the use of ‘geofences’ has also been noted. ‘Geofencing’ is a technology installed in each scooter (tied to GPS tracking), which slows down or disables the device’s electric motor when it enters certain geographical areas where scooter use is not allowed. When accessing restricted zones or ‘no-go zones’, the scooter can suddenly stop or slow down without the user knowing, remotely controlled by the mobile application that knows when its current location aligns with the no-go zones defined by the city (Sharp, 2019). Since it has proven difficult to enforce the users themselves to abide by the rules, new attention is being paid to the kinds of technologies with which the device itself can pull the strings of where it can and can’t go. While geofencing is welcomed as a technical solution to human problems, its effectiveness has been questioned (California Department of Transportation, 2020). It often confuses riders with shifting boundaries and uneven effects across different e-scooter providers. Sudden stops or slowing down functions, when the users are uninformed as to why they happen, can simply be considered as malfunctions and deter people from using shared e-scooters altogether. As such, international experiences of e-scooter governance indicate the difficulty of actually executing rules and regulations on e-scooters. The sheer existence of ‘rules’ itself will not guarantee public safety, and the technical solutions are not the panacea either; the right recipe of blending hard enforcement, soft enforcement (enabled by technologies), and effective public education should be tested and developed further.

Can E-Scooters Become a New Smart Mobility Option for Brisbane?

A Little History

Brisbane's e-scooter trial period began in November 2018. However, this trial was almost 'forced' onto the government transport authorities; Lime was already going to deploy the scooters regardless of regulatory fuzziness, and the Queensland State Government hurriedly arranged interim policy changes to legalise them. Although Lime had been in discussion with city councillors to bring its dockless scooters to Brisbane, Transport and Main Roads (the department of transport in Queensland; TMR) was against them up until the day before their launch. TMR initially warned that it would be illegal for anyone to participate in the trial and that they could be fined up to AU\$10,444 (Caldwell, 2018a).³ Despite the warning, Lime had planned to go ahead with its pilot scheme. The state government finally agreed to facilitate a fast-tracked process of regulation exemptions, passing the interim regulation change overnight.

Towards the end of February 2019, Brisbane City Council (BCC) devised a procurement strategy and activity plan to establish a formal operating agreement for shared e-scooters in Brisbane. The adopted strategy reaffirmed the Council's authority to amend or end the agreement if deemed necessary, stating that the Council has the 'absolute ability to extend, terminate or refresh the arrangement as required' (Brisbane City Council (BCC), 2019a). Two private operators were granted permits to create market competition as well as to incentivise improved service provision. The Council also ruled that if a company is granted a permit to operate personal transportation devices, they would need to pay a AU\$5,000 flat fee to operate plus AU\$570 per device approved (Brisbane City Council (BCC), 2019a) – on the basis of cost-recovery fees for carrying out a commercial activity on council assets (i.e. roads and public land). A Lime spokesperson vocalised commitment to paying the fee despite it being 'one of the highest fees in the world for scooters' (Stone, 2019a). The process resulted in companies Lime and Neuron being awarded year-long contracts to operate, with the option to extend for an additional two years.

Policies and Initiatives at Hand

The conditions of the shared e-scooter trial in Brisbane included mandatory helmet use, a speed limit of 25 km/h, and one person per device – as per the Queensland State Government’s regulations. The scooters had to be ridden on the footpath or the bicycle side of a shared path and could not be ridden on Brisbane CBD roads (Caldwell, 2018b). Following the trial, Lime was obliged to reduce their scooter fleet from 750 to 400, while Neuron was allowed to roll out 600 scooters on the streets. This decision was to reward Neuron for their impressive tender package including ‘Generation 3’ scooters. Neuron’s bright orange scooters/helmets (compared to Lime’s green ones) had a more resistant design, together with enabled geo-fencing technology to block or limit speed in high pedestrian areas and provide incentives to park the scooters in preferred locations (Stone, 2019b). Further, while Lime scooters had to be collected each night for their batteries to be charged, Neuron’s scooters were designed with changeable battery packs to allow scooters to be on the streets around the clock, depending on demand (Crockford, 2019). Table 2 below summarises some of the key policies in place for the e-scooters during and after the trial.

Although it seems that the Brisbane city government is making substantial efforts to regulate shared e-scooter use, as we also saw from international examples, it is not easy to actually enforce these regulations – especially due to e-scooters’ dispersive nature (resulting from their portability and dockless pick-ups and drop-offs). Helmet use, speeding and regulating space competition have not been well-managed, either because there is a lack of awareness of the rules or people are unwilling to obey them. One participant noted that ‘it’s fair enough to bring in those sort of regulations, but governments have a role to play in ensuring there’s an awareness’ (Urban Planner 1, Interview on 08/29/2019). ‘Regular non-use of helmets’ (Traffic Engineer 1, Written response on 09/13/2019) was observed with others mentioning helmet use dwindling due to theft of the operator-provided helmets (see Figures 2 and 3). Further, while geofencing is promising, its application (e.g. ‘no-go’ zones, slow-zones, no-parking zones) is currently inconsistent across different private operators (see Figures 4 and 5), and its effect on overall speed limit remains uncertain. In Brisbane City Council meetings, there had been several disagreements over the Council’s ability to control enforcement of helmet use and speed limits, responsibility for which was often deflected to the State Government and their engagement (BCC 4580 Ordinary Meeting, 02/12/2019, pp. 3–5, 30–32; BCC 4584 Ordinary Meeting, 03/12/2019, p. 42; BCC 4586 Ordinary Meeting, 03/26/2019, pp. 40, 44–45). Regardless of whose responsibility it is to cope with the e-

scooters and their increasing popularity, our findings show the city to have been managing matters haphazardly.

Key Challenges of E-Scooter Governance in Brisbane

Above all, the arrival of the shared e-scooters was largely seen almost as a ‘policy crisis’ to built environment/planning professionals in Brisbane, with their overnight arrival and limited warning, or planning resulting in a game of catch up. People were curious when the scooters arrived, with practitioners questioning amongst their colleagues ‘why are they here?’ and ‘how did they get here?’ (Urban Designer 1, Interview on 08/29/2019). The disruption of e-scooters was framed by one interview participant as ‘just the start of the whole change of the transportation sector . . . reminding us that autonomous vehicles are eventually going to be here’ (Urban Designer 2, Interview on 08/29/ 2019), while flagging that predicting the long-term impacts of such disruptions will be very difficult. Another issue consistently spoken about was where people should be riding the e-scooters. Planners noted the increasing conflict between pedestrians, cars, and cyclists as one of the key challenges. With regard to where scooters should be ridden, all interviewees mentioned the inherent conflict for space and the feeling of e-scooters not really belonging to any space. One participant felt that ‘they sit in . . . an awkward in between – between should they be treated like a bike or treated like a person in terms of pedestrian or cycle and who’s allowed to go where’ (Urban Planner 2, Interview on 08/29/2019). Interviewees also found users to be uncertain of where they should or should not ride, noting the lack of ‘a clear indication of where the scooters can and can’t go’ (Urban Designer 1, Interview on 08/29/2019). One participant suggested that the city should ‘make it clear where riders are supposed to travel’ (Traffic Engineer 1, Written response on 09/13/ 2019), as the lack of clarity around where the e-scooters should go has exacerbated the battle for space.

Since the shared e-scooters are led and operated by private companies, the roles and responsibilities of the private sector also arose as a key topic. The private sector’s accountability in regard to helmet management, subsidising infrastructure, sharing their data, articulating regulations, and clearly communicating their plans in Brisbane were discussed. In regard to mismanagement of helmets, the Lord Mayor (Brisbane City Council (BCC), 2019b) stated that the city would hold Lime accountable in terms of its responsibilities as the

operator, especially with regard to helmet use: ‘One of our great concerns . . . is the wearing of helmets. They [i.e. Lime] need to step up to the plate more in terms of the provision and encouraging people to wear helmets’ (p. 5). The discussed responsibilities of the private sector went beyond public safety concerns; they also included the ‘problem’ of public infrastructure (such as bike lanes) being captured by the private business operations. A similar phenomenon was observed in the aforementioned case of San Francisco, where the scooters are required to be parked in bicycle docks, which are public facilities. The authorities in San Francisco hence mandated the shared e-scooter operators to financially contribute to expanding the dock infrastructure. Comparable policy issues are also surging in Brisbane, where planners and councillors claim that there should be new models of paying for infrastructures with regard to the public-private dynamic of e-scooter sharing. Councillor Sri specifically stated that: ‘It will be necessary to build more bike lanes to accommodate these scooters which is a good thing but surely the scooter companies should be able to contribute a bit towards the cost of that infrastructure’ (Brisbane City Council (BCC), 2019a, p. 44).

Finally, in terms of the role of government in facilitating e-scooters as a new mode of transport, interview participants alluded to the city’s lack of a more concerted vision on transportation policy. Multiple participants noted the obvious backwardness of BCC’s recent policy proposal to increase car parking in new developments. One participant mentioned that it is plausible that e-scooters’ increased use could decrease the pressure on parking supply, while the politics in Brisbane is still actively supporting car-driven urban form and infrastructure. Participants referred to the proposed policy (of increasing parking rates) as a ‘backflip’, as well as ‘in direct conflict’ to encouraging ‘some of the newer transport modes that are coming on board’ (Urban Planner 4, Interview on 08/29/2019). Overall, interviewees expressed sentiments around how the city government showed a lack of leadership and vision in handling the introduction of e-scooters in Brisbane, with one participant stating that BCC ‘should be incorporating scooter use into their plans as opposed to just plonking it in and seeing what happens’ (Urban Designer 1, Interview 08/29/2019). Months later (in May 2020), in response to criticism that Council was ‘tinkering around the edges’ when they extended the e-scooter companies’ contracts for another year, Councillor Murphy assured that Council was working with the State government to develop an active transport plan that would take into account the needs of all constituents, including rolling out the scooters to suburbs for ‘last mile’ trips (Stone, 2020).

Discussion: Implications of E-Scooter Governance on Public Policy and Planning Theory

The problems highlighted by the challenges of e-scooter governance in Brisbane and other cities – the uncertainty of technological disruption, the permeation of private interest into the public sphere, and the extent of government intervention in balancing the competing/contradictory interests of public and private – are not new. The uncertainty of technological developments and the crisis of public governance were prevalent issues in the 20th century. Therefore, we discuss below the implications of e-scooter governance in light of existing public policy debates, mainly focusing on Lindblom's 'science of muddling through' (Lindblom, 1959), Dewey's 'socially organised intelligence' (Dewey, 1927, 1935), and Leitner, Peck, and Sheppard's discussion on contesting neoliberalism/modes of social regulation (Leitner et al., 2007). We have chosen these three theoretical angles for the following reasons. First, due to our interest in writing from the perspective of built environment practitioners who encounter unexpected technological disruptions in their everyday practice, we find Lindblom's 'trial and error' approach to policy learning (that can only be fulfilled through actual, on-site practice) useful. Second, over the course of our research on e-scooter governance, we realised that regulating/responding to mushrooming new technologies (often led by private sector) in urban road space (mainly public infrastructure) cannot be meaningfully discussed without engaging with democratic governance literature. The urban planning discipline has a historical relationship with Dewey's pragmatist philosophy on this matter (Healey, 2009), and we wanted to extend that dialogue by pointing out Dewey's prescient insights on regulating the technical for the benefits of the social. Finally, given our interest in democratic governance, acknowledging the constraints of the current economic system (and its tendency for market domination) was critical. However, due to our priority in linking planning theory and practice (i.e. offering something that could be useful for planning practitioners here and now), we wanted to talk about more projective and pragmatic ways of balancing public interests within the overwhelming presence of market-driven interests. Leitner, Peck, and Sheppard's work has argued for an engaged research practice that is not only critical of the capitalist status quo, but also sufficiently grounded enough to see the constellation of local actors, cultures, and a political climate that attempt to defy the neoliberal logics of the world.⁴

The Science of Muddling Through

The story of Brisbane's e-scooter governance captures the spirit of Lindblom's 'science of muddling through' (1954), where public administrators strive to achieve realistically possible improvements through continuous trial and error – rather than finding the perfect solution. Lindblom's article has demystified the usual policy making process for everyday public administrators, comparing 'root method' and 'branch method'. The 'root method' relies on a 'futile attempt' at superhuman comprehensiveness – i.e. reviewing all the theories (related to the policy issue), gauging all potential public concerns/values (that will be affected by this policy one way or the other), and then coming up with a magic formula that addresses all of them. On the other hand, the 'branch method' acknowledges the fact that there is a limited time and knowledge when dealing with complex policy problems. The policy makers using 'branch method' are well aware of the reality that policies are never made once-and-forall – rather, they are slowly carved out of an endless adjustment, a succession of incremental changes: 'Policy-making is a process of successive approximation to some desired objectives in which what is desired itself continues to change under reconsideration' (Lindblom, 1959, p. 87). Brisbane's case exemplifies this process perfectly: the city government approved a trial period shortly after the e-scooters' overnight arrival, instead of holding it off until the city could grasp all of the scientific proof, related to public safety/equity concerns in e-scooter use. Its further adjustments on the existing policy were supported only through the facts at hand (rather than debates over academic theories or abstract values); because Neuron proposed a better service operation – e.g. voluntarily experimenting with 'no-parking' or 'slow' zones (see Figure 6), distributing a more robust/safer model of scooters, the use of colourful helmets that are more apt for preventing accidents – the company gained a larger fleet size compared to their competitor. Further, the Councillors in Brisbane have debated whether the private operators should contribute to public infrastructure provision/improvements, given the scooters are using public roads and cycle lanes. These further demands and adjustments would be possible since the Council was adamant about its absolute right to 'extend, terminate and refresh the arrangement as required' in the initial agreement phase.

Socially Organised Intelligence

The phenomenon of today's rapid technological development – and society's constant struggle to catch up with its pace – has been professed most powerfully in Dewey's work *Public and Its Problems* (Dewey, 1927) and *Liberalism and Social Action* (Dewey, 1935). Written in response to the Great Depression and the rise of the fascist regime in Germany, what Dewey saw as the source of social ills was the lack of 'socially organised intelligence' that can address the 'cultural lag' – i.e. society's inability to collectively and democratically deal with the issues that mushroom along with constantly shifting technologies. In fact, this diagnosis is closely related to the socio-political crisis of our time: the ever-expediting globalisation and technological advancements which have been blamed for the rising social inequality and the upwelling of populism (Stiglitz, 2012). While acknowledging that addressing the time gap between technological development and social development would be the key challenge for human societies of the 20th century, Dewey did not believe that the answer to this 'cultural lag' is to withdraw from the technological evolutions. Rather, it is up to society to properly embrace them through social organisation and democratic intelligence, through citizens' impassioned interest and participation in local public affairs:

We have . . . sufficiently emphasized the role of technological and industrial factors in creating the Great Society. . . . It is silly and futile to ignore and deny [their] economic facts. They do not cease to operate because we refuse to note them, or because we smear them over with sentimental idealizations. . . . What actually happens in consequence of industrial forces is dependent upon the presence or absence of perception and communication of consequences, upon foresight and its effect upon desire and endeavor. Economic agencies produce one result when they are left to work themselves out on the merely physical level, or on that level modified only as the knowledge, skill and technique which the community has accumulated are transmitted to its members unequally and by chance. They have a different outcome in the degree in which knowledge of consequences is equitably distributed, and action is animated by an informed and lively sense of a shared interest. (Dewey, 1927, p. 181–182)

The existing debates on communicative planning theory focus on how to arrive at a meaningful agreement despite the plurality of different publics (i.e. their divergent interests,

values, core beliefs; see Healey, 2009). On top of that, what we wish to highlight here is that the uncertainty of technological advancements should be considered an opportunity to reinvigorate citizen engagement, or simply put, residents taking interest in everyday local public affairs. If we cannot always predict and plan for the latest technologies and the potential impacts of their disruption, the job of planners may become manifesting ‘postmodern’ approaches to urban governance in which public education, engagement, and multi-stakeholder relationship building are prioritised over the imposition of ‘expert knowledge’ (Jon & Reghezza-Zitt, 2020).

It is important that we distinguish Dewey’s meliorism from the aforementioned Lindblom’s incrementalism. The key difference is that Lindblom’s ‘branch’ policies leave the ‘roots’ intact – i.e. the underlying hegemony of the market – while band-aiding the negative consequences that emerge. Dewey, by contrast, wishes to ‘mobilise collective intelligence to accomplish a more fundamental or far-reaching realignment of values and reorganisation of institutional arrangements’ (than leaving it up to a rather relativistic process of ‘muddling through’; see Lake, 2017).⁵ Consider the case of Seattle, where legalisation of e-scooter sharing was delayed for almost two years until the public deliberation process had played out. While other ‘early adopter’ cities such as Santa Monica scrambled to give the ‘green light’ as soon as possible, Seattle held its ground and simply refused to allow e-scooters on its streets, without any word or projection on when they would be back in the game. Seattle’s unique trajectory – taking the time that it needs for public engagement and deliberation, in lieu of starting as soon as possible and haphazardly adapting as things evolve – perhaps shows a different way of welcoming a new technology. It is undeniable that the immediate economic argument and private companies’ impatience for profit may occlude the city’s long-term pursuit for general public wellbeing and safety. Some cities may feel pressured to make a hasty initial decision and muddle through from there, while others like Seattle may design their own schedule under mayoral leadership – leaving sufficient room for more collective, democratic decision-making processes. Seattle’s model is closer to Dewey’s emphasis on the role of ‘socially organised intelligence’, especially when it comes to navigating the rapid evolution of technologies and their unknown impacts.

The only form of enduring social organization that is now possible is one in which the new forces of productivity are cooperatively controlled and used in the interest of the effective liberty and the cultural development of the individuals that constitute

society. . . . Organised social planning, put into effect for the creation of an order in which industry and finance are socially directed in behalf of institutions that provide the material basis for the cultural liberation and growth of individuals, is now the sole method of social action. (Dewey, 1935, p. 59)

Contesting Market Domination/Modes of Social Regulation

The sudden invasion of private e-scooter operations in the public sphere can conveniently be interpreted as another proof of the pervasiveness of market domination. However, the reality presented in the story of Brisbane (together with the international cases discussed above) also demonstrates the power of timely government intervention. As Leitner et al. (2007) have argued, human society is a lot more complex than being simply subsumed into market rationality. In the end, neoliberalisation is not ‘immune’ to the forces of contestation:

Really existing markets must be successfully embedded in the social and cultural relations of everyday life, and they require state intervention in order to function. Firms may be compelled to respond to social and cultural pressure (e.g., reduce pollution or regulate sweatshops) to retain social legitimacy. Neoliberal states find it necessary to maintain some welfare state provisions and acknowledge human rights. In short, neoliberalisation must conform to some degree with social constructions of legality, ethics, and justice to maintain legitimacy, notwithstanding efforts to redefine justice along neoliberal lines. (Leitner et al., 2007, p. 10)

Such a realistic account rings true to our paper. As we saw above, in Brisbane, the city councillors adopted a short-term, conditional approval of e-scooter operations (i.e. a ‘trial period’ with the possibility to revoke the agreement at any point in time) in order to incentivise good service provisions while penalising the bad ones. Private operators are not necessarily going to get away with whatever they’ve come up with to maximise their profit; the examples of San Francisco and Seattle show that the government can be more decisive about the role of the private sector. If Paris was simply reactive towards e-scooter governance (i.e. controlling fleet size only in response to public complaints), Seattle demonstrated a more proactive approach that turned the uncertainty of e-scooters into new opportunities for transportation equity. These examples show that nonneoliberal logics can be very much

present within the governmental operations in a capitalist economy. City governments, in order to legitimise their presence (to their local constituencies), are pressured to stay transparent in their decision-making processes, as well as to respond to concerns of the public. Such self-fixing aspects of capitalist society have been noted by regulation theory, which emphasises the historical specificity of how capitalism unfolds in reality – such that capitalism’s general tendencies may be modified in different ways depending on the local cultural or political climate (Peck & Tickell, 1992). Durable and flexible modes of social regulation can emerge in a way that do not necessarily follow the predominant market rationality: ‘Despite the functionalist tendencies in some regulationist writing, institutional forms of social regulation are not reducible to the immediate requirements of the accumulation system’ (Peck & Tickell, 1992, p. 360).

Conclusion

Our findings and discussion highlight the importance of the recognition that a majority of challenges in welcoming e-scooters – i.e. space competition with other light mobilities, defining roles and responsibilities of the private sector, keeping up with fast-paced societal changes – are governance problems (e.g. different actors negotiating and adjusting their positions). These challenges are not necessarily solvable through mere technical improvements. Even when technologies such as geofencing exist, it is up to the city government to continually survey and decide where the ‘no-go’ zones should be – so that they can mandate private practitioners to streamline their services accordingly.⁶ In such decision-making processes, public engagement and consultation with local communities could provide fruitful guidance rendered available through the residents’ lived experiences. Ultimately, what shines through these examples is that effectively managing technological disruptions in cities relies a lot more on the ‘soft’ aspects of planning – i.e. politics, governance, and engagement. The examples of ‘good e-scooter governance’ actions can include: setting up an effective communication channel across planners (involved in land use or community engagement) and metropolitan-scale transport agencies⁷ ; public education and engagement, to enhance public awareness on where to ride or to resolve space conflicts between different light mobility users; and finally, reflecting on how e-scooters may influence the manifestation of different community values – such as safety, equity and environmental sustainability.

Connecting these empirical experiences with existing theoretical debates in public policy and urban governance has deepened our interpretation of e-scooter regulations beyond transportation planning – contributing to a wider discussion on planning in the era of uncertainties, regardless of whether these were rendered by technological disruptions or by other abrupt, unexpected changes in our society (e.g. disasters). Future research can expand this discussion by focusing on the following:

- The science of muddling through: Governing strategies of e-scooters and other light electric vehicles provide an excellent contextual setting in which the dream of the ‘all-knowing’ eye (i.e. the perfect answer ‘once and for all’) is challenged. The reality of heightened uncertainties around new technologies has been pushing governments to adopt a more flexible and modest approach to policy making that is open to change and amelioration (Kim, 2019). Researchers can further document the ‘trial and error’ or ‘constant adjustment’ approach to policy making, especially in the context of city governments’ keeping up with technological developments. Future research can also shed light on the pros and cons of such constant policy adaptations (in terms of their impacts on everyday realities of citizens), as well as how the existence of civil society and non-governmental advocacy groups contribute to the governance dynamics of ‘muddling through’ – going beyond Lindblom’s initial focus on different governmental departments as generators of diverse opinions/perspectives.
- Socially organised intelligence: If policy approaches are to become amenable, how can they be held accountable for their ‘trials’? The other side of the ‘flexibility’ in public policy is irresponsibility, for it can be neglectful of human suffering and other negative consequences that occur in the process of policy evolution. In this enigma between the reality (of having to let go of modernist control) and the government’s responsibility for public values (in proving the legitimacy of policy actions to its constituents), Dewey’s ‘socially organised intelligence’ reminds us that the point of governance is not just responding to technologies and what’s to come, but also cultivating a civic agora and political culture in which different publics can discuss/debate about the implications and meaning of these unavoidable technological disruptions. The planning discipline has embraced this aspect through

communicative/consensus planning (Healey, 2009); one can go beyond this literature in looking at more radical visions that Dewey projected in his writing, where he believed that economy and technology should be ‘socialised’ through public debates and collective solidarity building (Lake, 2017; Livingston & Quish, 2018). Every introduction of a new mobility technology, like any other infrastructure or urban development project, can be considered an opportunity to renew public debates on what each community wishes to stand for, and how this new technology can help advance such community-driven goals. Future research can be dedicated to this linkage of how technological disruptions (or the uncertain social impacts of rapid technological advancements) can help further the case for more citizen engagement and ‘democratic equality’ (Anderson, 1999).

- Contesting market domination: Looking at actually existing markets and their operations eschew an overly dramatic account of market domination, as they also exhibit different modes of social regulation – how government interventions can shape the future course of market interests and their pervasive intrusion to the public sphere. Future research can investigate the motivations, effectiveness, and operationalisation of these government interventions/policies/regulations that interrupt the profit-driven installation of new smart mobilities. Are these regulations always related to calibrating capital accumulation? Are they a reflection of the market interest’s pragmatic approach to perpetuating the status quo? Or can they actually represent something more than simply assisting the market – such as prioritising community-driven values (over private profit)? Does having more effective citizen engagement contribute to more effective control of market interests? Researchers can help unpack the potential answers to these questions by using e-scooter governance as an illustrative example.

More than just being a fun way of getting around, people are seeing the potential for e-scooters to be a legitimate option for travel around urban areas. Their portability and effortless use, compounded by the convenience of dockless sharing using mobile GPS, offers one of the easiest ways to make efficient trips – expanding the possibilities of how we move and where we go by filling the gap in existing transport provision. In the long term, they may have positive impacts on alleviating congestion through reducing car dependency, as well as increasing accessibility in cities. In that sense, disruptive technologies not only present

challenges of muddling through uncertainty, but also opportunities to rethink how we plan and govern cities. Developments in communication technologies are instigating the trend of micro-mobility and more decentralised modes of transport in cities. As such planners should be ready to harness such novelties that are often ushered by the private sector, via adequate policy interventions and prompt actions that prioritise the public interest and safety. To do so, planners should understand urban space as a continually (re)negotiated site of state-market interface, where constant readjustment (to the changing social/political/ technological climate) and long-term partnership-building with divergent social actors are imperative. Greater focus on reinstating the role of planner as effective carriers of collective vision and societal values is also warranted, as it will guide them through the unknown.

Notes

1. Mayor Durkan posited concerns around safety, protecting the City's budget from personal injury lawsuits, and equity with regard to road/sidewalk space competition (Mayor Jenny Bicknell, 2020; Durkan, 2019). 2. Riding an e-scooter in the open air probably has less risk than riding public transport if there are multiple people using it (on a packed tram for example). 3. The ground for their illegality was based on the fact that, according to the Queensland road rules, motorised scooters must not be able to travel faster than 10 km/h, and Lime scooters (and the time of launching) were able to travel up to 27 km/h. 4. While we have focused on these three theoretical angles, there are other alternatives depending on the researchers' preference and priority: researchers interested in the environmental sustainability side of smart mobility (e.g. Docherty et al., 2018) have engaged with the 'transitions theory' literature (Coenen et al., 2012; Geels, 2011); others interested in a more radical redemocratisation of transportation planning could draw their inspirations from Mouffe (2005) or Rancière (1999) (see Legacy, 2016). 5. The quote is from Robert Lake, communications with the authors, March 2021. 6. For instance, in Seattle, the Department of Transportation (SDOT) decides the geofenced areas of 'noride' zones; 'no ride zones' are 'areas that SDOT has determined to be unsuitable for scooter use. Riding into a no-ride zone will slow your scooter to a stop; it will begin working again when you leave the noride zone' (City of Seattle, 2020). 7. There has been an increasing attention on the concept of 'Mobility as a Service' (MaaS) in transportation planning; MaaS aims to provide all transport options through a single platform that integrates the modes as well as payment for the service (Shaheen et al., 2017; e.g. using the same transportation card for all services including tram,

bus, bicycle, e-scooter, etc.). However, the concept of MaaS remains broad at the moment and delving into the specific possibilities of it is beyond the scope of the present paper. The present paper is written from the perspective of planners and the city government that are now confronted with the sudden appearance of e-scooters – focusing on the political aspects of e-scooter governance. We encourage other researchers to explore using MaaS as an approach to integrate e-scooters into the existing transport provision/infrastructure at a metropolitan scale. At the same time, we wish to highlight the fact that such embrace of new technology should go beyond the technical aspects of ‘smooth operation’, since, as we’ve argued throughout our Discussion, technologies have social and political implications that invite planning’s role in citizen engagement and contesting market domination.

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