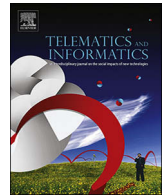




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# Monopolizing mobilities: The data politics of ride-hailing platforms in US cities

Torin Monahan

University of North Carolina at Chapel Hill, United States

## ABSTRACT

Smart-urbanism discourses frequently invoke the transformative potential of data to solve city problems, but data are neither neutral nor are they readily shared in the pursuit of common goals. Drawing upon a two-year study of large-scale digital platforms in US cities, this paper investigates conflicts over data sharing between city transportation departments and ride-hailing companies such as Uber and Lyft. By maintaining data monopolies, platform companies obfuscate the detrimental impacts of their services (e.g., increased congestion and pollution, dangers to cyclists and pedestrians) and interfere with city transportation planners' tasks of diagnosing city needs and providing services for the public good. Ride-hailing companies' resistance to data sharing serves the strategic goals of prolonging monopoly status and slowing regulation for maximum capital extraction, but I argue that it also performs a more insidious function of entrenching platform practices and logics, making alternatives difficult to imagine or implement. Against this backdrop, I explore the notion of a "data commons" approach to transportation management.

Proponents of smart urbanism frequently invoke the transformative potential of data to solve city problems. Whether the concerns are with transportation, crime, pollution, or flagging economies, data collection and analysis figure prominently in technocratic visions of urban futures (Kitchin, 2014; Murakami Wood and Mackinnon, 2019; Shapiro, 2019). In contrast to the frictionless city utopias presented by industry players, however, data are neither neutral nor are they readily shared in the pursuit of common goals; rather, data are aligned to specific—usually financially profitable—applications and actively hoarded by technology companies. System configurations may vary across geographical and cultural contexts, but a neoliberal approach to data access and use predominates, such that "smart urbanism remains rooted in pragmatic, instrumental and paternalistic discourses and practices rather than those of social rights, political citizenship, and the common good" (Cardullo and Kitchin, 2019: 813). This orientation to smart urbanism is solidified, in part, through the "discursive dominance" of technology companies in defining problems to fit their particular solutions (Lee et al., 2020; Monahan, 2018; Sadowski and Bendor, 2019: 540), regulatory environments that prioritize industry needs (Gibbs, Krueger, and MacLeod, 2013; Morozov and Briar, 2018), and radical "information asymmetries" in the access to platform-generated data (Grubestic and Alizadeh, 2019; Petersen, 2019).

Conflicts over data access, especially between cities and technology companies, provide a window into the politics and the stakes of increasingly datafied cities. In the case of "ride-hailing" or transportation network companies (TNCs),<sup>1</sup> such as Uber or Lyft, data sharing represents the next battlefield as the companies struggle to maintain market dominance in an increasingly uncooperative regulatory environment. For instance, whereas companies like Uber initially adopted a blitz approach to saturating urban markets in the United States (and elsewhere) before regulators could intervene (Stehlin et al., 2020)—and then often influencing state-level "preemption" of restrictive local laws—they have been losing regulatory ground as cities and states impose labor rules, congestion charges, fees per ride, citywide bans, or caps on the number of vehicles permitted (Collier et al., 2018; Davidson and Infranca, 2018; Griswold, 2019). Given that many of these platform companies have never been profitable, in spite of their remarkable growth and

E-mail address: [torin.monahan@unc.edu](mailto:torin.monahan@unc.edu).

<sup>1</sup> I adopt the widely used term "transportation network companies" to signal the multiple integrated functions of such platforms beyond the mere coordination of discrete trips.

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popularity, their long-term survival may depend on expanding into new spaces (e.g., autonomous vehicles) or commoditizing their vast data repositories (Srnicek, 2017).<sup>2</sup> From the perspective of city transportation planners, however, TNC data are essential for diagnosing city needs and providing services for the public good. In a very real sense, therefore, “data wars” between cities and TNCs are contests over visions for the city.<sup>3</sup>

Drawing upon a two-year study of large-scale digital platforms in three US cities (Boston, Austin, and San Francisco), this paper investigates conflicts over data sharing between city transportation departments and TNCs. I claim that by maintaining data monopolies, platform companies obfuscate the detrimental impacts of their services (e.g., increased congestion and pollution, dangers to cyclists and pedestrians). Moreover, the data monopoly model imposes platform logics on transit ecologies in large cities and contributes to a downward spiral for public transit: decreased public transit use leads to decreased funding, which in turn leads to fewer transit options and makes platform alternatives more attractive. While TNC resistance to data sharing with cities serves the strategic goals of prolonging monopoly status and slowing regulation for maximum capital extraction, I argue that it performs a more insidious function of entrenching platform practices and logics, making alternatives difficult to imagine or implement. Against this backdrop, I explore the notion of a “data commons” approach to transportation management to secure *the possibility* of inclusive, equitable, and safe mobilities in cities.

## 1. Methods

This article draws upon data from a two-year study of the mediation of digital platforms by US cities. The primary platforms investigated were transportation network companies (e.g., Uber), short-term rental companies (e.g., Airbnb), and delivery services companies (e.g., Amazon). The primary research questions were (1) How are local organizational forms and functions altered in response to platform capitalism? (2) What resistances and affordances are presented by existing technological infrastructures? and (3) How does local cultural practice mediate the deployment and use of digital platforms? The methods included document analysis, GIS mapping, observation, and interviews with key informants in my three case-study cities (Boston, Austin, and San Francisco). By studying different city responses to a range of large-scale platform companies and types, the project was able to document patterns in platform deployment, along with cultural and regional differences in platform negotiation and integration.

The material analyzed here come predominately from interviews with key informants who had direct experience managing or contending with TNCs. By design, interviewees represented a range of different organizational sectors, including industry, government, academia, labor unions, community groups, and non-governmental organizations. Interviewees were identified based by their prominence and expertise in their respective areas, as determined by insider publications, media reporting, or direct referral from other informants. Through this approach to interviewing multiple stakeholders, the project was able to compare perspectives by the organizational affiliation of actors and generate a multidimensional understanding of the challenges and possibilities introduced by TNCs in cities.

In total, 34 semi-structured phone interviews were conducted from March to September 2019, with each interview averaging 70 min in length. Interviewing continued until saturation was achieved in the types of responses received from interviewees (Charmaz, 2014). All interviews were audio-recorded and professionally transcribed before being verified and coded by the research team. I employed abductive analysis (Tavory and Timmermans, 2014) to simultaneously focus on previously identified categories of platform mediation and unexpected themes that emerged organically from the data. In all cases, confidentiality was maintained during recruitment, data collection, and analysis. Additionally, although I do reference specific cities to convey regional-based experiences and variation, in order to protect research participants, all interviewees and their respective organizations are kept confidential in this and other publications emerging from this project.

## 2. TNC impacts

The relative illegibility of ride-hailing vehicles, especially compared to highly visible taxis, allows TNC companies to mask their overall presence in and impact on cities. Nonetheless, academic and public awareness has been growing rapidly, especially with regard to the exploitative labor arrangements imposed upon gig-economy drivers, who are typically classified as independent contractors without the labor protections and benefits of employees (Anderson, 2016; Friedman, 2014; Raval and Dourish, 2016; Ravenelle, 2019; Webster, 2016). Instead of viewing gig-economy work as exceptional, as simply a way for people to supplement their income, it is now becoming apparent that such labor arrangements and insecurities are becoming the norm; for instance, recent data suggest that roughly 36% of workers in the US are involved in gig-economy work of some sort (McFeely and Pendell, 2018). Economic precarity and employment insecurity are affordances of TNC platforms; these affordances fuel TNCs’ business model of undercutting other transit services by offering cheaper and more plentiful—if often less reliable—options for customers.

On the level of city streets and highways, TNCs introduce the problem of significantly increased traffic congestion: from the overall number of vehicles, their movement without passengers (“deadheading”), and their interference with rights of way, such as

<sup>2</sup> A core part of this data commoditizing process is *platform surveillance*, which connotes “the manifold and often insidious ways that digital platforms fundamentally transform social practices and relations, recasting them as surveillant exchanges whose coordination must be technologically mediated and therefore made exploitable as data” (Murakami Wood and Monahan, 2019: 1).

<sup>3</sup> Characterizing such struggles as “data wars” calls attention to the oftentimes combative and uncooperative dynamic between TNCs and cities, as well as to the significant stakes for the resulting quality, function, and governance of cities.

blocking bike lanes or double parking (Clewlow and Mishra, 2017; Erhardt et al., 2019; Speck, 2018). Cities contend they could especially use data on total number of vehicles and vehicle routes to measure and mitigate the impact of TNCs, but these are some of the data most closely guarded by companies. In response, some cities, like San Francisco, have partnered with academics to skim data from Uber and Lyft using the platforms' application programming interfaces (APIs) to obtain this information. This particular San Francisco partnership found that "TNCs serve a substantial number of trips in San Francisco, over 170,000 on a typical weekday, that these trips follow traditional time of day distributions, and that they tend to take place in the busiest parts of the City" (Cooper et al., 2018: 192). City officials interviewed as part of my study also used proxies, such as the number of granted TNC licenses in states that require them, revealing over 180,000 TNC licenses in Massachusetts, for instance, compared to roughly 5000 taxi licenses in the same state. As my informants explained, even having rough data of this sort is essential for measuring and responding not only to traffic conditions but also to the physical impacts of TNC vehicles on roads, which cities must repair and maintain. As might be expected, the total number of vehicles and their non-revenue (deadheading) transit correlate as well with pollution in cities (Hall et al., 2018; Wenzel et al., 2019).

When situated within the multimodal transit ecologies of cities, TNCs also raise the question of their impacts upon other transit modes. Early data suggested ambiguous and counterintuitive findings, such as TNCs increasing some public transportation use in cities with well-developed train and bus systems (Galbraith, 2016) but simultaneously exacerbating traffic congestion because people were taking trips that they otherwise would not (Marshall, 2017). More recently, systematic reviews of the literature on the effects of ride-hailing platforms point to a *decline in public transportation use*, especially in dense urban environments (Jin et al., 2018). On the level of specific cities, recent studies have found significant drains on public transit use, with 33% of TNC users in San Francisco, for instance, who would have opted for public transit if they were unable to use TNCs (Rayle et al., 2016), and in Denver, 22.2% would also have similarly chosen public transit (Henao and Marshall, 2018).

### 3. Data-sharing potentials

City transportation planners feel a desperate need for TNC data in order to perform their jobs. The issues for them are not necessarily regulating TNCs but instead identifying deficiencies in public transit networks, managing parking and curb spaces to optimize use, ensuring the safety of pedestrians and bicyclists, reducing pollution, and accommodating populations with limited mobilities (e.g., the disabled or elderly). Whereas in most US cities, transportation planners previously had a fairly good understanding of the flows and density of single-occupancy vehicles, taxis, and public transit services, TNCs cloud those data when their vehicles are practically indistinguishable from non-commercial ones. As one transportation planner in Boston bemoaned:

It's hard to plan a city when you don't know 100,000 of the trips that are happening every day. Where are they happening? How are they happening? What times of day are they happening? How should we think about public safety in reaction to those? How do we think about reallocating parts of infrastructure to support them? You can't really do any of that without the underlining data underneath it.

With those data, according to such planners, specific solutions could be tailored to city residents based on identified needs. For example, a different transportation planner in Boston shared:

It would be great for the T [The Massachusetts Bay Transportation Authority] to just know how many people are concentrated in certain spots within Lower Allston to say, "Okay, we need to start diverting some of our bus lines to pick up people in these areas so they have a reliable way of getting around rather than jumping in a car and adding to the congestion that's already on our roads."

From this perspective, transportation planners are especially interested in taking a holistic look at city needs and correcting limitations in existing transit systems. The motivation is not to compete with TNCs, per se, but to draw upon existing data to meet the public good.

Data sharing could also have the potential of increasing infrastructural support for TNCs, particularly if cities deemed that dedicated pick-up and drop-off zones were needed. For example, a government contact in Austin explained:

I would love to know that along this block of Congress Avenue in Austin, Texas, we see X number of TNC pick up and drop offs per day. That would help me better understand... how much parking do I need versus can I take some of those parking spots and turn them into a TNC drop off/pick up and get better mobility. At the end of the day, I'm not trying to protect parking spots; I'm trying to incentivize more sustainable mobility options for the city of Austin. Can we reduce single-occupant vehicles? Can we reduce greenhouse gasses? And can we create a more healthy environment for people to move around in?

The same informant went on to explain that in the era before TNCs, he could rather accurately assess mobility volume by mode (e.g., public transit, taxis, single-occupancy vehicles), but that the ambiguity of TNC vehicles muddies the data and makes it nearly impossible to craft precise strategic plans.

While generally resistant to data sharing, representatives from TNC companies also recognize that selective, aggregate-level data sharing could be in their financial interests too. One example that was referenced repeatedly in my study was a partnership between TNCs and Washington, DC, where the city was granted partial access to aggregate TNC data, which it drew upon to accommodate TNCs better at certain times and locations. As one TNC representative explained: "they [DC planners] were able to create new rules for the usage of certain segments of the curb in those high traffic areas that would make them available for pick up and drop off usage at the times that the data demonstrated would be when the highest demand occurred from Uber and Lyft." It is understandable why

this arrangement would be attractive to TNCs because it ultimately signals cities' adaption to ride-hailing practices, where cities attempt to minimize the problems caused by TNCs (e.g., double parking, traffic) by modifying parking rules to support these platform-based options better. When it comes to the prospect of sharing more fine-grained data that could lead to other solutions, such as pick-up/drop-off restrictions or increased bus service, TNC companies are much less willing to cooperate.<sup>4</sup>

#### 4. Resistance and evasion

Without question, TNCs' primary response to data-sharing requests is to stonewall. They perceive data sharing as introducing unacceptable risks, mostly in the form of regulation, and almost no benefits. Interestingly, the very act of cities asking for industry data positions cities as supplicants, allowing TNCs to weave various sorts of arguments—such as the need to protect the privacy of users—to evade those requests. The longer cities go without these data, though, the more entrenched TNC practices and problems become, such that public infrastructure and space are gradually absorbed into privatized platforms and repositioned as resources for platform objectives.<sup>5</sup> Cities and city officials, for their part, have to contend with the “externalities” (pollution, damaged roads, transit inequalities) produced by this neoliberal articulation of smart urbanism.

A few industry representatives in my study were candid about the risks they perceived with data sharing. One TNC administrator related:

Why are we hesitant to share it [our data]? I would say at a meta level it's because... the only responses we've seen, really, have been cap, fee, more restrictions... I cannot point to a single example anywhere in the United States where a greater level of data transparency has led to anything but a bad outcome for us in terms of regulations. So, that's a pretty dark statement, but I think that sort of explains a little bit of why there's a hesitancy there... If I know the only reason you [laughs] want to do this is to make rules that make it impossible to operate this business, how am I going to make the case that that's a good idea?

Obscurity with data sharing allows companies to deny their effects upon urban environments—to dismiss complaints of increased traffic, for example, as subjective or anecdotal rather than objectively measurable and systemic. Data asymmetries place cities at a disadvantage both for managing everyday flows and for interrupting problematic industry trends.

Whenever possible, in the US, the central TNC strategy for evading data sharing or regulation has been to petition to states to claim jurisdiction over cities and override their ordinances (Collier et al., 2018; Davidson and Infranca, 2018). Known as “state preemption,” this is a move that holds true for other platform sectors too, such as Airbnb appealing to state legislators in Texas to overturn rental restrictions passed by the city of Austin (Davidson and Infranca, 2018). As an industry informant explained:

Uber and Lyft saw the benefit of being regulated at the state level rather than by things like city agencies that were, sort of, in bed with the taxi industry, so they actively sought that in a lot of other jurisdictions. Now, that meant that cities, who had been preempted by states, did not have any authority to compel the TNCs who might be operating in their city to share data with them. That was a great frustration to cities.

Some of my TNC informants even laughed at the disconnect of state-level Department of Transportation workers, who may be “very nice people, but they're focused on highways,” and are otherwise out of touch with urban policy needs. That said, TNC representatives anticipate that states may not always be so industry friendly or unaware, and they also acknowledge heightened threats of regulation in some large US cities—such as Seattle, New York, and Chicago—that have maintained municipal authority. Consequently, they are turning to other legal arguments to challenge data sharing.

Across the board, TNCs are now making a case against sharing data, especially individual trip-level data, on the grounds of protecting users' privacy. This is a multi-pronged argument that spuriously situates industry players as legally responsible and technically capable actors, while positioning city authorities as less capable and potentially malicious. One TNC representative made a privacy appeal on these grounds:

At the end of the day, we have consumers' personal information that they've entrusted us with... We take it very seriously. So, I don't know that most cities are equipped to handle that sort of data or would want that liability hoisted upon them once they do take over that data.

Industry informants also expressed concern not about industry-based “platform surveillance” (Murakami Wood and Monahan, 2019), which is normalized in this scenario, but about state authorities who could use industry data to target undocumented immigrants or even stalk former romantic partners. The same TNC representative quoted above related that the problem with TNCs sharing data would be with state agents

<sup>4</sup> While certainly an anomaly in my study, one TNC representative did indicate that there could be *city data* that they would like to have access to also, but that—by and large—cities do not have those data at present, or at least not in forms that would be most useful: “Having access to high-fidelity public data sets about the uses that are allowable on different street/curb segments would actually be really useful to these [TNC] companies. I wish I could say that they have access to that, but most cities actually don't have those kinds of data sets available in a format that can be ingested and really implemented effectively by TNCs.”

<sup>5</sup> This trend can be seen quite clearly with the move to include selected public transit options within TNCs' apps, slowly making these apps a one-stop-shop for all transportation planning (van Dijck et al., 2018). In the process, TNCs can subtly steer customers to their preferred options and amass valuable data on customer choices and routes along the way.

having personal identifying information of their citizens without [citizens] expressly giving consent to the city of having it... [With trip-level data], it's not hard for a city employee to go, "Oh, that's where my ex-girlfriend lives," and "Oh, why is she going to this place every day," or "Why are you going there?"

This is a line of argumentation that conveniently ignores this exact type of behavior at tech companies like Google and Uber (Chen, 2010; Hern, 2016), while also presenting an all-or-nothing approach to data sharing that overlooks mechanisms for anonymization or aggregate reporting.

Transportation planners and other non-industry informants, by contrast, saw few privacy risks to cities receiving industry data. When asked directly, they would say things like, "I think there are no risks, meaning that ... if we get to a point where there is more data sharing happening, there are ways to anonymize the data or to aggregate it in ways that, you know, individuals are not identified." Others, anticipating data-commons types of solutions, pointed to third-party partnerships as somewhat intuitive answers for keeping sensitive data protected:

I think third party is one option. Academic partners would be a good option. There's lots of other trusted parties that you could have to house that data and to do the analysis on it. I think the ride-hail companies are just reluctant to do so because they don't necessarily see the win in it for them. They see sort of a bigger authoritarian thumb instead.

While concerns about data being used for state surveillance should not be disregarded, particularly given the centrality of security and policing in smart urbanism schemes (Laufs et al., 2020; Leszczynsk, 2016; Klauser and Söderström, 2016), the privacy arguments of TNCs are also a form of misdirection that masks their voracious data acquisition and shores up their data monopolies. Some of the community group members in my study zeroed in on just these concerns:

A lot of these companies like to pat themselves on the backs for giving some basic data over to cities and towns... I think it's more important for our cities and towns to be asking, "How is data being managed and protected by these companies?" We have a lot of good laws on the books to protect credit card information, but we're still pretty murky on what it means to protect someone's trip from point A to point B and who gets to see that and how they get to use that information... But what are the questions that we are asking of that data? That is more important. And, TNCs are collecting significantly more vast data than we need to solve those problems.

Privacy is at risk with TNC practices, but the companies themselves are key agents in generating that risk as they fabricate massive databases of customer data, locations, associations, routes, and other elements to pursue platform dominance through surveillance-based profiling and prediction. While cities, especially their transportation and engineering departments, have missions of providing for the public, even if they invariably fall short in some way, TNCs may instead have more to gain through the privatization of the public, by poaching upon existing infrastructures while public transit options are eroded. In this context, privacy-protection arguments allow TNCs to paint themselves as protectors of fundamental rights and state agents as threats to those rights, all the while postponing data sharing or disclosure that might support smart urbanism partnerships for the public good.

## 5. Pursuing a data commons

Underlying most disputes over TNC data sharing is the question of who has a right to the city. If city roadways and spaces are perceived as a commons—as collectively owned resources that should, ideally, support public needs above all others—then private use (and abuse) of those resources is in tension with that view. Recognizing their tenuous position with respect to appropriating publicly owned and managed urban infrastructures, representatives from TNC companies often speak of their services as providing unmet transportation needs and supplementing—rather than competing with—public transportation systems.<sup>6</sup> They present themselves as city partners. Yet, when city transportation planners and engineers see opposite trends (such as a decline in transit use) and feel hamstrung by a lack of data about TNC vehicles on roadways, they are more likely to veer toward the need for regulation to compel companies to share their data and otherwise cooperate with city agencies.

There was a range of positions on how to approach data sharing, with the strongest of them starting with assertions of city rights that were being overridden in some way. Some of the community advocacy groups in my study were the most outraged about the relative impotence of cities in dealing with TNCs. For instance, one organizer proclaimed:

The fact that we have to compel a private company to share the data that they're using on publicly owned streets is ridiculous. In order to use these streets that should have been a part of the contract from day one; if you're going to use curbside space, if you're going to use these streets that are owned by the residents of this city, you should share the data that we could use to make the lives of our residents better. That is not your data to hoard.

<sup>6</sup> Seeing TNCs as complementing public transit is typically framed in terms of solving the "first-mile/last-mile" problem of connecting transit modes, not taking into account the valence of TNCs to become the *only* mode once people commit to it. The following quote from a TNC representative in my study illustrates this position: "If you lived three miles from a bus station, or a train station, that's a lot to walk in work attire, especially if you live in Texas where it's hot as it is here. And again, you're not going to drive your car three miles to get on that [bus or train], but if you could push a button and you and your neighbors split a \$6 Uber ride to get to the station y'all both go to, that's great... So, I think it really does supplement public transportation. It makes it more accessible."



Many city transportation planners concurred with this sentiment but recognized the legal constraints placed upon most cities, especially given the state-preemption strategies of TNCs. One planner in the Boston region related:

I think the best examples of this you're seeing [of data sharing] is sort of through legislation and regulation, like New York City's TLC [Taxi and Limousine Commission] or some of the stuff that's in Chicago where they have actually said, "Well, you can't operate without sharing this information." That seems like a pretty good path forward. There's not enough cities that have that authority... You've got to work through the state legislature, and that's hard to do.

Because TNCs have already penetrated cities and have been operating without much oversight up until now, it is difficult to position them as unwelcome outsiders who should agree to terms for continuing to use common resources. In this context, legal remedies are performative agonistic ones that, while surely necessary, are unlikely to foster meaningful long-term cooperation.

An alternative, or complementary, approach would be to erect some sort of "data commons" for the sharing of data across organizations. In theory, a data commons could allow TNCs to share sufficiently granular data with cities for planning purposes, could provide a way for cities to share data with TNCs on traffic patterns and curb space rules, and could offer sufficient protections for customers by enforcing access controls and anonymizing (or aggregating) trip-level data. As one city worker conveyed: "There's immense importance in figuring out how you share information back and forth. If you're utilizing a public asset to run your business and your business is dependent upon that asset, there should be some exchange of information as a result." Anticipating resistance from TNCs that fear the risk of regulation or the loss of intellectual property, transportation planners pushing for a data commons are quick to clarify that such a repository would not include all data elements indiscriminately:

Data commons doesn't mean throw all your data into this one big open lake and everybody can look at it. Data commons means that we're all agreeing on a common approach on how we're going to manage data and, more importantly, different layers or levels of data and how those are managed.

For instance, the informant continued, there could be cases where personally identifiable information (PII) might be subpoenaed by law enforcement to assist with investigations, provided they followed appropriate legal routes for doing so. Another possibility could be to provide cities with some demographic data of TNC users in order to identify transportation inequities by group so that cities could work toward social justice solutions. A data commons, from this perspective, would not be a free-for-all but would instead necessitate petitions for data access based on specific articulated needs and established authority. It would also necessitate the involvement of intermediaries, either from industry, academia, or other governmental bodies, to manage the data and access to it. Along these lines, the US Department of Transportation hosts a "Secure Data Commons" that allows researchers and city planners selective access to data for analysis while restricting access to raw data (D'Agostino, 2019; U.S. Dept. of Transportation, 2020); likewise, companies such as "SharedStreets" are entering this space as well, offering similar services for industry and government clients.<sup>7</sup>

There is some precedent for these types of data sharing arrangements. For example, my informants related that because transportation planners in Los Angeles felt taken off guard by the rapid infiltration of TNCs, they decided to be much more proactive with the regulation of so-called micromobility companies, such as those offering app-based scooter or bicycle rentals. They mandated that such companies adhere to Mobility Data Specification (MDS) protocols to make data from their devices (e.g., real-time location information) available to city workers while also ensuring the privacy of users (LADOT, 2018). Interestingly, micromobility companies were initially quite eager to comply with these requirements so that they could saturate urban markets as quickly as possible. Once the big TNC companies such as Uber and Lyft entered the micromobility scene, they were far less compliant. A former micromobility representative in my study explained:

There's been this big policy conversation happening about a proposed data standard that the Los Angeles Department of Transportation developed, called MDS, or the Mobility Data Specification, and it's something that both Lime and Bird were both very supportive of and... [the companies] actively evangelized and helped promote to other cities around the country to try to get all the cities using the same format so that it would be more efficient for them to share data. But, now that Uber and Lyft are, themselves, becoming active through their acquisitions of Motivate and Jump [bike and scooter-rental platforms] in the micromobility space—they are now operators of bike and scooter services—they are trying to kind of put the genie back in the bottle, opposing MDS on the basis of privacy, going to state legislatures, like in California with AB-1112,<sup>8</sup> and trying to preempt cities from being able to collect this data through a format like MDS.

This pattern of opposition to data sharing, even when there are very few apparent financial risks to doing so, reveals how monopolistic tendencies are woven into the DNA of large-scale digital platform companies. If platform dominance is achieved through colonization of other markets, products, and spaces (Murakami Wood and Monahan, 2019; Srnicek, 2017), then cooperation or data sharing will always be anathema to platform logics. As cities are enfolded into and subordinated by platform ecosystems, possibilities for ensuring the public good—however fraught they might be—are eroded. The fact that platform companies are so allergic to participating in a data commons should be a sign of the merits and importance of such an effort.<sup>9</sup>

<sup>7</sup> <https://sharedstreets.io/> [accessed January 31, 2020]. See also the UK's "Open Data Institute": <https://theodi.org/> [accessed May 7, 2021].

<sup>8</sup> California's Assembly Bill 1112 would prohibit cities from requiring "companies like Bird, Lime, and Jump to limit numbers, meet equity goals, or fully share data" (Zipper, 2019).

<sup>9</sup> This is not to say that data sharing should be equated unproblematically with the public good. The easy circulation and fusion of data has

That said, a data commons approach cannot serve as a panacea for the transportation challenges of cities. A call for more data, even open data geared toward public needs, risks reifying mythologies of data as neutral, unconstructed, and accurate representations of the world (Kitchin et al., 2015). Such a call may unwittingly valorize data and their collection and thereby support a systems-informed mode of urban governance that itself has contributed to many city problems and inequalities (Graham and Marvin, 2001). A data commons approach may stand a greater chance of succeeding if its proponents confront these inherent politics and work to align data resources to a city's holistic needs, not just its discrete transportation components. This is the case, for instance, in Barcelona, where recent planning goals extend beyond optimizing transportation flow to reducing the total number of vehicles, restricting TNCs, and supporting healthier, less polluting options such as bicycling (Cardullo et al., 2019). Additionally, a robust and functional data commons would entail "data commoning" to invite scrutiny through standardized formats and accessible interfaces (such as dashboards) for researchers, policymakers, and the public (De Lange, 2019; Stehle and Kitchin, 2020). In short, a functional data commons would require activation through an ongoing investment of labor and capital to achieve its full potential and maintain its harmonization with public needs.

## 6. Conclusion

Access to data may seem like a somewhat technocratic field upon which to wage battles over the purpose and function of cities. Yet, when urban problems and needs are blurred through the relative invisibility and increasing prevalence of platform-mediated practices, lack of data impedes corrective action. In the absence of data, government bodies, community groups, and others find themselves struggling to measure the effects of digital platforms upon city systems or to intervene intelligently to provide for people. In the case of transportation network companies like Uber and Lyft, data from the companies could aid city transportation planners and engineers in locating needs (e.g., additional bus stops, transit options for the disabled) or correcting TNC-induced problems (e.g., congestion, blocked rights-of-way). With the spread of TNCs in cities, however, city transportation workers are akin to individuals gradually losing their vision: not only are they having a hard time apprehending new developments with any clarity, but they are also losing sight of general traffic flows and patterns that were once central to their operations. The regulation of TNCs is also made more difficult in the absence of data about their direct impacts upon physical infrastructures, neighborhoods, or transit systems.

Large-scale digital platforms are imperialistic and monopolistic by design: they gain dominance by appropriating existing spaces and services, positioning themselves as obligatory passage points, and crowding out competition (Langley and Leyshon, 2017; Murakami Wood and Monahan, 2019; Pasquale, 2017).<sup>10</sup> Data define and infuse these companies. Platform companies' competitive edge is secured almost exclusively through the data they produce and stockpile, through the fine-grained and often real-time adjustments they make to control markets and extract capital from them (e.g., through TNC surge pricing). Therefore, it should not be surprising that TNCs would sternly oppose any data sharing that would not benefit them directly and unambiguously. From this perspective, the much-touted DC partnership is no exception because it freed up additional curb space for passenger pick up and drop off, thereby solidifying rather than challenging TNC penetration. Even public transit presents a threat to TNC profits, as revealed by surveys of TNC customers who claimed they would use transit if TNCs were not available. So, the prospect of TNC data being used to improve transit services provides another reason for TNCs to hoard their data.

Given these trends, the notion of a data commons is a call for TNCs to live up to the smart-urbanism discourse of collaboratively using data to solve city problems. A data commons *could* provide a resource for cities to make informed transit decisions while simultaneously safeguarding user privacy and TNCs' intellectual property. This resource could also provide TNCs with data about city curb space segments and rules, traffic patterns, and so on to assist with their planning. Yet, as the example of micromobility companies in Los Angeles shows, TNCs actually have very little interest in participating in any sort of data commons. Instead, they are committed to data dominance through monopoly. For a data commons to have any promise, therefore, it would have to be predicated in the first instance on a reassertion of cities as shared spaces and lived environments for the public good. It would have to advance a vision of smart urbanism that required platform companies to petition for the use of city spaces and resources, rather than plead for their cooperation after the fact. Otherwise, the public will continue to be colonized and depleted for private gain, and the politics of these moves will be obscured by the elusive technological platforms that govern our lives.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

(footnote continued)

supported various forms of profiling and social sorting, increasing insecurity and vulnerability for many groups in society (Monahan, 2017; Regan et al., 2015; Sadowski and Pasquale, 2015). At the same time, however, data restrictions can be linked to troubling conservative efforts to erode the scientific foundations of public institutions (e.g., the Census Bureau, the Environmental Protection Agency), thereby attenuating mechanisms for correcting social or environmental problems (Kinchy, 2020; Miller, 2017; Smith-Doerr, 2020).

<sup>10</sup> In this respect, large-scale digital platforms are somewhat like what Bruno Latour (1987) has called "centers of calculation," which build knowledge through the combination of data to achieve control at a distance.

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## References

- Anderson, Donald N., 2016. Wheels in the head: ridesharing as monitored performance. *Surveillance Soc.* 14 (2), 240–258.
- Cardullo, Paolo, Kitchin, Rob, 2019. Smart urbanism and smart citizenship: The neoliberal logic of ‘citizen-focused’ smart cities in Europe. *Environ. Plann. C: Politics Space* 37 (5), 813–830.
- Cardullo, Paolo, Di Felicianantonio, Cesare, Kitchin, Rob, 2019. Citizenship, justice, and the right to the smart city. In: Cardullo, P., Di Felicianantonio, C., Kitchin, R. (Eds.), *The Right to the Smart City*. Emerald, Bingley, UK, pp. 1–24.
- Charmaz, Kathy, 2014. *Constructing Grounded Theory*, second ed. Sage Publications, Thousand Oaks.
- Chen, Adrian, 2010. GCreep: Google Engineer Stalked Teens, Spied on Chats. *Gawker.com*. Available from <http://m.gawker.com/5637234/gcreep-google-engineer-stalked-teens-spied-on-chats?skyline=true&s=i> [accessed June 17, 2011].
- Clewlou, Regina R., Mishra, Gouri S., 2017. Disruptive transportation: The adoption, utilization, and impacts of ride-hailing in the United States. *Institute of Transportation Studies, Davis, CA* (accessed January 28, 2020).
- Collier, Ruth Berins, Dubal, V.B., Carter, Christopher L., 2018. Disrupting regulation, regulating disruption: the politics of Uber in the United States. *Perspect. Politics* 16 (4), 919–937.
- Cooper, Drew, Castiglione, Joe, Mislove, Alan, Wilson, Christo, 2018. Profiling transport network company activity using big data. *Transp. Res. Record* 2672 (42), 192–202.
- D’Agostino, Mollie Cohen, 2019. Mobility Data: How Your Travel Patterns Could Inform Policy. *Planetizen*, August 19. Available from <https://www.planetizen.com/features/105786-mobility-data-how-your-travel-patterns-could-inform-policy> (accessed January 31, 2020).
- Davidson, Nestor M., Infranca, John, 2018. The place of the sharing economy. In: Davidson, N.M., Finck, M., Infranca, J.J. (Eds.), *Cambridge Handbook on the Law of the Sharing Economy*. Cambridge University Press, Cambridge, pp. 205–219.
- De Lange, Michiel, 2019. The right to the datafied city: interfacing the urban data commons. In: Cardullo, P., Di Felicianantonio, C., Kitchin, R. (Eds.), *The Right to the Smart City*, Emerald, Bingley, UK, pp. 71–83.
- Erhardt, Gregory D., Roy, Sneha, Cooper, Drew, Sana, Bhargava, Chen, Mei, Castiglione, Joe, 2019. Do transportation network companies decrease or increase congestion? *Sci. Adv.* 5 (5) eau2670.
- Friedman, Gerald, 2014. Workers without employers: shadow corporations and the rise of the gig economy. *Rev. Keynesian Econ.* 2 (2), 171–188.
- Galbraith, Kate, 2016. Are Uber and Lyft helping or hurting the environment? *The Guardian*, January 21. Available from <https://www.theguardian.com/environment/2016/jan/21/uber-lyft-helping-hurting-environment-climate-change> (accessed January 5, 2018).
- Gibbs, David, Krueger, Rob, MacLeod, Gordon, 2013. Grappling with smart city politics in an era of market triumphalism. *Urban Stud.* 50 (11), 2151–2157.
- Graham, Stephen, Marvin, Simon, 2001. *Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition*. Routledge, New York.
- Griswold, Alison, 2019. Uber’s free-wheeling era of growth is coming to an end. *Quartz*, December 3. Available from <https://qz.com/1759492/uber-faces-tighter-regulations-in-its-most-important-cities/> (accessed January 30, 2020).
- Grubestic, Tony H., Alizadeh, Tooran, 2019. Introduction to the special issue: Why ‘Access to data’ is now more important than ever. *Inf. Soc.* 35 (2), 55–56.
- Hall, Jonathan D., Palsson, Craig, Price, Joseph, 2018. Is Uber a substitute or complement for public transit? *J. Urban Econ.* 108, 36–50.
- Henao, Alejandro, Marshall, Wesley E., 2018. The impact of ride-hailing on vehicle miles traveled. *Transportation* 46 (6), 2173–2194.
- Hern, Alex, 2016. Uber employees ‘spied on ex-partners, politicians and Beyoncé’. *The Guardian*, December 13. Available from <https://www.theguardian.com/technology/2016/dec/13/uber-employees-spying-ex-partners-politicians-beyonce> (accessed January 30, 2020).
- Jin, Scarlett T., Kong, Hui, Rachel, Wu., Sui, Daniel Z., 2018. Ridesourcing, the sharing economy, and the future of cities. *Cities* 76, 96–104.
- Kinchy, Abby J., 2020. STS currents against the ‘Anti-Science’ tide. *Engaging Sci., Technol.*, Soc. 6, 76–80.
- Kitchin, Rob, 2014. The real-time city? Big data and smart urbanism. *GeoJournal* 79 (1), 1–14.
- Kitchin, Rob, Lauriault, Tracey P., McArdle, Gavin, 2015. Knowing and governing cities through urban indicators, city benchmarking and real-time dashboards. *Reg. Stud., Reg. Sci.* 2 (1), 6–28.
- Klauser, Francisco R., Söderström, Ola, 2016. Smart city initiatives and the Foucauldian logics of governing through code. In: Marvin, S., Luque-Ayala, A., McFarlane, C. (Eds.), *Smart urbanism: Utopian vision or false dawn?*. Routledge, New York, pp. 108–124.
- LADOT, 2018. *Mobility Data Specification*. Los Angeles Department of Transportation, October 31. Available from <https://ladot.io/wp-content/uploads/2018/12/What-is-MDS-Cities.pdf> (accessed January 31, 2020).
- Langley, Paul, Leyshon, Andrew, 2017. Platform capitalism: the intermediation and capitalisation of digital economic circulation. *Finance Soc.* 3 (1), 11–31.
- Latour, Bruno, 1987. *Science in Action: How to Follow Scientists and Engineers through Society*. Harvard University Press, Cambridge.
- Laufs, Julian, Borion, Hervé, Bradford, Ben, 2020. Security and the smart city: a systematic review. *Sustainable Cities Soc.* 55.
- Lee, Ashlin, Mackenzie, Adrian, Smith, Gavin J.D., Box, Paul, 2020. Mapping platform urbanism: charting the nuance of the platform pivot. *Urban Planning* 5 (1), 116–128.
- Leszczynski, Agnieszka, 2016. Speculative futures: cities, data, and governance beyond smart urbanism. *Environ. Plann. A: Econ. Space* 48 (9), 1691–1708.
- Marshall, Aarian, 2017. Uber and Lyft Haven’t Revolutionized the American City—Yet. *Wired.com*, October 14. Available from <https://www.wired.com/story/uber-and-lyft-havent-revolutionized-cities/> (accessed January 5, 2018).
- McFeely, Shane, Ryan Pendell, 2018. What Workplace Leaders Can Learn From the Real Gig Economy. *Gallup*, August 16. Available from <https://www.gallup.com/workplace/240929/workplace-leaders-learn-real-gig-economy.aspx> (accessed January 28, 2020).
- Miller, Clark A., 2017. It’s not a war on science. *Issues Sci. Technol.* 33 (3), 26–30.
- Monahan, Torin, 2017. Regulating belonging: surveillance, inequality, and the cultural production of abjection. *J. Cult. Econ.* 10 (2), 191–206.
- Monahan, Torin, 2018. The Image of the Smart City: Surveillance Protocols and Social Inequality. In: Watanabe, Y. (Ed.), *Handbook of Cultural Security*. Edward Elgar, Cheltenham, UK, pp. 210–226.
- Morozov, Evgeny, Bria, Francesca, 2018. *Rethinking the Smart City*. Rosa Luxemburg Stiftung, New York.
- Murakami Wood, David, Mackinnon, Debra, 2019. Partial platforms and oligoptic surveillance in the smart city. *Surveillance Soc.* 17 (1/2), 176–182.
- Murakami Wood, David, Monahan, Torin, 2019. Editorial: platform surveillance. *Surveillance Soc.* 17 (1/2), 1–6.
- Pasquale, Frank, 2017. Two narratives of platform capitalism. *Yale Law Policy Rev.* 35 (1), 309–319.
- Petersen, Andrew Boyles, 2019. Scoot over smart devices: the invisible costs of rental scooters. *Surveillance Soc.* 17 (1/2), 191–197.
- Raval, Noopur, Paul Dourish, 2016. Standing out from the crowd: Emotional labor, body labor, and temporal labor in ridesharing. Paper read at Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing, at San Francisco.
- Ravenelle, Alexandra J., 2019. *Hustle and Gig: Struggling and Surviving in the Sharing Economy*. University of California Press, Oakland.
- Rayle, Lisa, Dai, Danielle, Chan, Nelson, Cervero, Robert, Shaheen, Susan, 2016. Just a better taxi? A survey-based comparison of taxis, transit, and ridesourcing services in San Francisco. *Transp. Policy* 45, 168–178.



- Regan, Priscilla M., Monahan, Torin, Craven, Krista, 2015. Constructing the suspicious: data production, circulation, and interpretation by DHS fusion centers. *Admin. Soc.* 47 (6), 740–762.
- Sadowski, Jathan, Bendor, Roy, 2019. Selling smartness: corporate narratives and the smart city as a sociotechnical imaginary. *Sci. Technol. Human Values* 44 (3), 540–563.
- Sadowski, Jathan, Pasquale, Frank, 2015. The spectrum of control: a social theory of the smart city. *First Monday* 20 (7) (accessed December 17, 2016).
- Shapiro, Aaron, 2019. Predictive policing for reform? Indeterminacy and intervention in big data policing. *Surveillance Society* 17 (3/4), 456–472.
- Smith-Doerr, Laurel, 2020. Hidden injustice and anti-science. *Engaging Sci. Technol. Soc.* 6, 94–101.
- Speck, Jeff, 2018. *Walkable City Rules: 101 Steps to Making Better Places*. Island Press, Washington, DC.
- Srnicek, Nick, 2017. *Platform Capitalism*. Polity, Malden, MA.
- Stehle, Samuel, Kitchin, Rob, 2020. Real-time and archival data visualisation techniques in city dashboards. *Int. J. Geogr. Inf. Sci.* 34 (2), 344–366.
- Stehlin, John, Hodson, Michael, McMeekin, Andrew, 2020. Platform mobilities and the production of urban space: toward a typology of platformization trajectories. *Environ. Plann. A: Econ. Space*. <https://doi.org/10.1177/0308518x19896801>.
- Tavory, Iddo, Timmermans, Stefan, 2014. *Abductive analysis: Theorizing Qualitative Research*. University of Chicago Press, Chicago.
- U.S. Dept. of Transportation, 2020. Secure Data Commons. U.S. Department of Transportation. Available from <https://its.dot.gov/data/secure/> (accessed January 31, 2020).
- van Dijck, José, Poell, Thomas, de Waal, Martijn, 2018. *The Platform Society: Public Values in a Connective World*. Oxford University Press, Oxford.
- Webster, Juliet, 2016. Microworkers of the gig economy: separate and precarious. *New Labor Forum* 25 (3), 56–64.
- Wenzel, Tom, Rames, Clement, Kontou, Eleftheria, Henao, Alejandro, 2019. Travel and energy implications of ridesourcing service in Austin, Texas. *Transp. Res. Part D: Transp. Environ.* 70, 18–34.
- Zipper, David, 2019. The California Legislature Is Getting Played by Micromobility Companies. *CityLab.com*, May 17. Available from <https://www.citylab.com/perspective/2019/05/california-state-laws-shared-mobility-city-rules-ab-1112/589705/> (accessed January 25, 2020).