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Urban mobilities in Mumbai: Towards worker-centric platformisation beyond 'urban solutionism'

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Abstract

As digital mobility platforms, such as ride-hailing apps, have become more widespread and popular, they have garnered public and scholarly interest as potential solutions to challenges of climate change, insufficient mobility services, urban congestion and pollution. This paper examines the potential of ride-hailing platforms through a more critical lens. Thereby I draw attention to how platform transportation workers in Mumbai, India, produce mobility services by collaboratively linking the social and material resources of the city. Networks and communities of transport workers have long been essential for providing intermediate mobility services in Mumbai, and continue to do so in the platform era. Building on these observations, I inquire whether there is potential for the creation of worker-centric platform models that benefit both the workers and the larger urban majority. Therefore, drawing on my fieldwork in Mumbai, I first explore how the current model of digital mobility platforms in Mumbai reinforces socio-spatial fragmentation in Mumbai while leaving workers with decreasing earnings and rising work pressure. Considering the agency of platform workers, I then aim to uncover how platform workers appropriate platform mechanisms and engage their collective knowledge and experiences in order to improve their working situation. I draw upon these insights to highlight how worker-centric approaches to digital mobility platforms can contribute to more inclusive and sustainable cities.

Keywords

alternative platform models, embeddedness, platform mobilities, platform urbanism, South Asia

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摘要

随着叫车应用等数字移动平台变得越来越普及和流行，它们作为解决气候变化、出行服务不足、城市拥堵和污染等挑战的潜在解决方案，引起了公众和学术界的关注。本文通过更具批判性的视角考察叫车平台的潜力。因此，本文关注了印度孟买的平台交通劳动者如何通过协作链接城市的社会和物质资源来提供出行服务。长期以来，运输工人网络和社区对于孟买的中间出行服务的提供都至关重要，在平台时代仍然如此。基于这些观察，本文探究是否有可能创建以劳动者为中心的平台模式，使劳动者和广大城市居民都受益。因此，根据在孟买进行的实地考察，本文首先探讨了孟买当前的数字出行平台模式如何强化孟买的社会空间碎片化，同时导致劳动者的收入减少、工作压力增加。考虑到平台劳动者的能动性，本文旨在揭示平台劳动者如何利用平台机制并运用他们的集体知识和经验来改善他们的工作状况。本文利用这些见解来强调以劳动者为中心的数字出行平台方法如何有助于建设更具包容性和可持续性的城市。

关键词

替代平台模型、嵌入性、平台出行、平台城市化、南亚

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Introduction

In recent years, digitally mediated mobility services (also called ride-hailing) have become increasingly widespread and popular in Indian cities, as in many cities worldwide. In Mumbai, these services entered into competition with the established metred and shared rickshaws and taxis that had long formed the backbone of intermediate public transportation in Mumbai. The arrival of Uber in Mumbai was met with welcoming responses. In their praises, customers and commentators often highlighted the role of digital technology in spurring change in the taxi sector. A commuter comments:

Bombay's cabs were viewed fondly by citizens because they were always available, charged by the metre, and rarely cheated riders. The system began to decay about a decade ago [...]. It took the mobile app revolution to provide a real alternative to the *kaali peeli*. In less than a year since I first rode an Uber, the service [...] has become indispensable to me. (Shahane, 2015)

Apart from providing an additional mobility option, experts point to further benefits

of digital mobility platforms, such as fostering employment and economic growth and alleviating urban environmental challenges. The image as problem solvers is nurtured by the platform firms themselves; an Uber official stated

When we started the service in Mumbai, we had solved a simple problem: How do you get a ride at the touch of a button. Now, a few years down the line, we have begun tackling an even greater challenge: Reducing congestion and pollution in our cities by getting more people into fewer cars. (Sen, 2019)

In the Mumbai metropolitan region, such expectations towards digital technologies are connected to decision-makers' and planners' confidence in solving complex urban problems with 'concrete' infrastructural and technological approaches, such as metro rail, monorail and road constructions. Particularly the region's quickly expanding network of elevated highways constitutes a prerequisite for the rise of car-based mobility, including ride-hailing. Critical scholars have challenged

such technology- and infrastructure-centric ‘solutionism’, arguing that infrastructure development and deployment of technologies are always subject to particular configurations of dominant social, political and economic interests (León and Rosen, 2021; Sætra, 2023), and the result of ‘acritical adoption of urban policy solutions from elsewhere’ (Montero, 2020: 2278). Hence, technology and infrastructure developments often fail to measure up to expected outcomes. In the case of Mumbai, it has been argued that the development of urban highway and metro rail systems disproportionately benefits the affluent parts of society (Low and Banerjee-Guha, 2003; Shaban and Sattar, 2023; Tiwari, 2013), while causing considerable environmental damage (Motiram, 2022).

However, examining the case of Mumbai, I argue that digital platforms still show promise as potential contributors to equitable, inclusive and sustainable cities. Therefore, I suggest utilising a worker- instead of a technology-centric approach to estimate this potential. As the case of Mumbai shows, operations of digital mobility platforms build on the knowledge, expertise and networks of established taxi driving communities (Kuttler, 2022). However, workers and their communities are not given active roles by the platforms in shaping the configuration and development of these services.

Acknowledging that digital platforms can have enormous value in supporting people in their everyday lives, but also recognising that current big capital supported platforms further foster inequality and concentration of wealth, one may ask: if the current techno-centric and exclusivist platform approach was turned into a worker-centric model, with ownership and operations in the hands of workers themselves, would digital platforms be able to serve the urban majority and contribute to making cities and their transport systems more equitable, inclusive and sustainable?

This paper seeks to foreground that platformisation of mobility services is embedded in existing urban transport regimes of cities in the Global South. This contribution has two major aims. First, it examines how the techno-centric ideas of platforms are entangled with Mumbai’s trajectory of transport infrastructure development, and how such solutionism builds on precarious platform working conditions and an extractive model of the city’s social and economic networks. Secondly, it explores how socially embedded, everyday practices of producing platform services hint towards potentially transformative models of platforms.

Accordingly, in the first part of the paper, I identify the characteristics of the current techno-solutionist model of platformisation. Then I connect the emergence of contemporary platform-mediated mobility services in Mumbai to the city’s fragmented infrastructural history and the evolution of its intermediate public transport (IPT) sector in the second part. In the third part, building on my empirical work, I turn to the collective and collaborative practices of mobility platform workers, as well as to the knowledge and expertise of driver communities. I conclude by highlighting how worker-centric initiatives could contribute to more equitable platform models.

Digital mobility platforms as urban solutions: Promises and realities

Globally, many governments at various levels, alongside different institutions and media outlets, expect digital platforms to aid in solving the challenges of climate change, urban congestion and deepening fiscal austerity (Santos, 2018; Stehlin et al., 2020). The narrative that digital platforms efficiently use ‘shared’ assets such as existing cars, infrastructures and resources creates assumptions among research communities that mobility

platforms could support sustainable mobility systems beyond a car-centric imperative (Kesselring et al., 2020; Schaller, 2021). At the same time, neoclassical economists and business analysts believe that digital platforms enable perfect competition, resulting in increased comfort, convenience and access for the cost-sensitive consumer (Parker et al., 2016). Therefore, it is expected that digital mobility platforms enable a system of multi-modal, on-demand mobility services that seamlessly integrate different transport modes, a system called ‘mobility as a service’ among transport planners (Jittrapirom et al., 2017). Platform companies actively nurture such expectations by highlighting their achievements and by promising to further improve their services according to sustainability criteria (Gromis, 2021).¹

These global tendencies can also be observed in regional and local contexts, for example in South Asia. The Government of India welcomed the introduction of digital mobility platforms as ‘problem solvers’. In India, mobility platforms have filled the void that the limited public transport options and capacities in Indian cities have created. Therefore, the federal and several state-level governments reiterate the claims made by platform firms (Kuttler, 2023b; NITI Aayog, 2018). Interestingly, some problems digital platforms are expected to respond to today are the consequence of earlier initiatives that – in the name of spurring economic growth – fostered individual, car-based urban mobility. In the 1990s and 2000s, rising car ownership led to increased congestion in inner cities and the dispersal of settlement structures (Pucher et al., 2005; Verma et al., 2021). The Indian government responded by investing large amounts into the construction of elevated highways and road overpasses in attempts to decongest cities and enable uninterrupted flows of private car traffic (Gopakumar, 2015, 2022), further incentivising motorised mobility. In Mumbai,

highway development focussed on linking areas deemed as relatively more valuable, such as business parks, malls, the airport and affluent housing zones (Harris, 2013; Low and Banerjee-Guha, 2003). The government’s recent expectations towards ride-hailing platforms build upon these earlier and ongoing infrastructural developments. At the same time, these expectations also represent a shift away from the panacea of large investments into monumental transport infrastructure projects, since trust is invested in efficiency gains through algorithmic governance (Basukie et al., 2020).

Overall, as global urban policies and discourses shift ‘from the city as a sustainability problem to the city as a sustainability solution’ (Angelo and Wachsmuth, 2020: 2201), digital platforms have become part of a more comprehensive *solutionism* that regards cities and technologies themselves as leverages for ‘saving the planet’ (see also Montero, 2020). However, this techno-optimism obscures the more diverse outcomes of platformisation in the urban environment.

These outcomes, but also the ramifications of platforms’ failures to meet expectations, are becoming more thoroughly examined and understood (Dattani, 2021; Leszczynski, 2020). Transportation studies, for example, have painted a mixed picture regarding the benefits of ride-hailing so far.² Still, the trajectories of urban technological solutionism – that digital platforms are part of – and the character of the problems to be addressed by these platforms need to be further examined. Platforms primarily serve the demands of urban elite and middle classes for increased comfort and convenience; however, simultaneously they are expected to *also* solve the repercussions that the rise of automobility in cities like Mumbai have produced in the first place (congestion, air pollution etc.). Similarly, due to the focus on technology, the role of the producers of services – specifically the platform workers – in

the creation of urban solutions has not been explored sufficiently. In the current platform model, workers are taken for granted and expected to respond almost robotically to the consumption demands of customers. As a result, all over the world, platform work is characterised by low remuneration, unsafe working conditions, comprehensive surveillance and little to no guaranteed rights to unionisation and worker representation (Graham et al., 2017; Woodcock and Graham, 2019). In this regard, current platformisation is the continuation of an urban development model that builds on the urban small-scale economy as it creates pathways of accumulation for urban elites on the shoulders of vulnerable and marginalised urban dwellers and their precarious labour conditions (Harriss-White, 2020; Marx and Kelling, 2019). According to the beliefs of regulators, platform work may solve severe urban unemployment; however, rather than focussing on efforts to create secure employment opportunities, decision-makers are more interested in spurring a platform-based economic growth model that seeks to capture socially produced value and foster 'micro entrepreneurship' (Rossi, 2019).³

Since observation has shown that platform workers are often depicted as passive bystanders in descriptions and narratives of platformisation, it is important to investigate the relationship between platforms and their workforce and the respective local context in more depth, thereby shedding light on their socio-spatial embeddedness.

Platform power and worker disenfranchisement

The operational models of contemporary ride-hailing platforms rely on the existing local infrastructures and assets as well as the presence of a substantial share of urban dwellers in search of work (Sadowski, 2020; Stehlin et al., 2020). It has been frequently

argued that as digital platforms are embedded in particular local contexts, asymmetrical relationships between platforms, workers and local regulators evolve. Srnicek (2017) argues that platforms' 'parasitic' mechanisms of local embedment advance private profit interests through the use of publicly funded assets, and, at the same time, put additional pressure on public infrastructure. Observations show that platforms concretely reshape urban spaces and infrastructures as well as altering the use and perception of urban space through their various algorithms, internal architectures and mechanisms (Richardson, 2020; Shapiro, 2023; Valdez, 2023). However, the logics of platform algorithms are usually invisible and 'black-boxed' (Lee and Björklund, 2019). This opacity leaves workers with incomplete information about working conditions (Shapiro, 2020), and also permits frequent changes to rating system criteria, and reward and loyalty programmes. Such mechanisms make workers highly dependent on the volatilities of the platform economy and encourage workers to compete against each other (Sivarajan et al., 2021; Vasudevan and Chan, 2022). Mobility platform work is characterised by highly individualised work schedules and isolated driving practices (Wells et al., 2021). Furthermore, authors have argued that algorithmic management in platform work is deskilling labour, risking platform work, such as driving a taxi, being increasingly considered to be menial labour (Cole et al., 2022; Mahmoudi et al., 2020). These characteristics further limit workers' capacities to take ownership of a potentially more equitable and sustainable urban transport system.

Both platform firms and state institutions consider platform workers to be solely interested in individual gains, but not to play meaningful roles in achieving collective societal aims. However, such an understanding ignores how strongly the platform economy

shapes, and is shaped by, the particular local socio-spatial conditions and the way workers engage their social networks, experiences and mutual understandings to make platform services operational (Nowak, 2023; Qadri and D'Ignazio, 2022 for Jakarta). This shows how platform firms are actually heavily dependent on these local socio-material networks. This dependence allows workers to manoeuvre and appropriate platform mechanisms, for example, to gain additional income without paying commission to platforms, but also to achieve (collective) aims, such as growing their networks or practising models of economic solidarity (Anwar and Graham, 2020; Chen and Qiu, 2019; Rossi, 2019). Although platforms try to prevent such unintended activities, they cannot completely control workers and the logics of worker networks. Hence, this dependence makes platform operations vulnerable to some degree (Leszczynski, 2020). The interception of urban embeddedness and platform vulnerability raises potential ways for more progressive and democratic 'alternate platform futures' (Graham, 2020: 455). Hence, digitally mediated operations carry the potential of being turned into an inclusive model that serves those who are producing services and possibly the urban majority society.

In this regard, alternative platform models have been receiving increased attention in recent years. Diverse alternative models exist, including, for example, platform cooperatives (either for- or not-for-profit) that are co-owned by their members and democratically governed (Scholz, 2016, 2023). Community-based digital economies of solidarity that differ substantially from the big capital platform model also exhibit such democratic and inclusive potential. These do not necessarily designate themselves as cooperatives, but can be understood as 'worker-owned technologies from below' that are 'experimental, prefigurative, and [of] proto-typing nature' (Grohmann, 2023: 281). As

Zhu and Marjanovic (2020) argue, platform cooperatives provide social benefits, such as poverty and inequality reduction as well as gender equality, but also potentially contribute to reducing climate impacts and fostering responsible consumption patterns.

Bridging the gaps within transportation infrastructure: Mumbai's IPT services and platform mobilities

Mumbai's transportation infrastructure has simultaneously united and divided places and people since the colonial era; hence the city's 'splintering' and fragmentation can be traced back to early urban infrastructure development (Zerah, 2008). In the postcolonial era, modernist visions of 'rational' transportation infrastructure according to a networked infrastructure ideal became more prominent (Harris, 2013). Governments developed plans and programmes for providing fast and uninterrupted mobility by both individual and collective transportation services (Bedi, 2016a; Low and Banerjee-Guha, 2003). After economic liberalisation in India in 1991, efforts to implement large, iconic transportation projects supported by international expertise and finance were intensified.

As these projects continually emerged, they contributed to further fragmentation and polarisation of Mumbai. Although public transportation development has received increasing attention since the 2000s, the construction of new infrastructure is prioritised over efforts to upgrade pre-existing transportation services – such as the suburban rail and public bus systems – that are vital to millions of daily commuters (Banerjee-Guha, 2008). Hence, Mumbai's transportation infrastructure and services continue to be fragmented and characterised by disruptions, contradicting the imaginations of the modern

networked, circulatory city that the urban elites adhere to. Instead, Mumbai's recent infrastructural developments have created enclosed 'spaces of noninterruption [...] outside the infrastructural unreliability of the rest of the city' (McFarlane, 2010: 134).

Since transportation infrastructure and services are far from ubiquitous and comprehensive in most Global South cities, intermediate public transport (IPT) services are widespread. IPT services are vital to many cities, but are usually not operated, commissioned or endorsed by state institutions. Instead, self-employed owner-drivers or small groups of vehicle owners and renters operate and organise these services, relying on small-scale networks of exchange, communication and transaction consisting of people who engage technologies and material resources (Hyrapiet and Greiner, 2012; Parsons and Lawreniuk, 2017; Sopranzetti, 2013). In Mumbai, shared and metred auto rickshaws and taxis close the existing gap in public transportation provision. When mobility platforms started operating in Mumbai in 2013,⁴ the metropolitan region was characterised by a highly uneven and fragmented socio-spatial landscape. Its transport infrastructure favoured uninterrupted car mobility, while the development of a new metro rail system was just about to begin. For many upwardly mobile, middle-class urbanites, the aspiration for private automobility – which is connected to perceptions of identity and social status – still remained unattainable (Nielsen and Wilhite, 2015). Hence, metred and shared taxis and rickshaws had continued to fill the gaps in the transportation system across all socio-economic strata of Mumbai's population, until radio and fleet taxis started operations in Mumbai in the late 2000s, and ride-hailing platforms emerged shortly after. Ride-hailing services met the demand of the young urban middle class for convenient and safe (auto)mobility (Kashyap and Bhatia, 2018), a demand

especially prevalent amongst young women (Annavarapu, 2022; Butcher, 2019).

While an average commute of low-income and middle-class citizens in Mumbai is inter-modal (besides the train, it involves walking or travelling by metred or shared auto or taxi to reach the train station), ride-hailing provides direct, uninterrupted point-to-point mobility. Hence, platform mediated mobility services have become particularly important to the white-collar workforce as the preferred mode of commuting. In major Indian cities, about 40–50% of ride-hailing users are employees of IT industries (Bhattacharya, 2021). For Mumbai, the dispersed settlement structure in the periphery of the Mumbai Metropolitan Region (MMR) provides fertile ground for commutes with private cars (Shirgaokar, 2014) and, hence, also for platform mobility services. As a result, the presence of digital mobility platforms could further propel premium road infrastructure developments that cater mostly to private motorised transportation rather than public transportation. As platform mobility services have become increasingly popular, large road infrastructure projects that aim to decongest the city and 'eliminate bottlenecks' – such as the controversial Coastal Road and the recently inaugurated Trans Harbour Link – could receive additional justification and approval.

Additionally, the passenger experience of riding platform taxis is distinct from those of conventional metred taxis, auto rickshaws or public transportation in Mumbai. Providing point-to-point connection from the doorstep inside gated apartment blocks to workplaces within fenced office complexes, air-conditioned platform taxis render the sensory experience of the urban environment amorphous. In such a 'capsular secession' (Graham, 2018: 540), digital mobility platforms provide another avenue for the kinetic elite of Mumbai to create exclusive comfort zones and to enjoy the amenities and

opportunities of the city without being exposed to the everyday squalor. Such detachment, however, is not a form of circumventing the existing city in the sense of a “bypass” approach to urbanisation’ that creates premium enclave spaces at the city’s periphery (Bhattacharya and Sanyal, 2011: 47). Instead, platform mobility services allow the middle classes and urban elites to conduct their lives in upscale spaces right in the core of Mumbai.

Digital mobility platforms do not only reproduce and legitimate infrastructural splintering of the city and enable detached lifestyles. Circumvention of the urban reality also engenders urban imaginations that invoke a sense of modernity while it obfuscates the mobility needs of the poor. As early as 2006, Nikhil Anand wrote:

Administrators and elected political representatives [...] make transportation policy on the city as they see it through the windscreens of their air-conditioned cars. [...] A reading of planning documents and interviews with planners and the political elite tell of the situated interests of these citizens. (Anand, 2006: 3425)

Such perceptions are in stark contrast to the reality of the poorest urban dwellers in Mumbai who walk to work in order to save money, or spend up to a fifth of their household income on transportation (Cropper and Bhattacharya, 2012).

This short examination of the evolution of Mumbai’s transportation landscape allows the following conclusions: first, contemporary mobility platforms are running in parallel to (and partially replacing) existing IPT services that had hitherto closed the gaps in Mumbai’s public transportation infrastructure and had so far met urban dwellers’ increasingly road-based mobility demands. From such a perspective, ride-hailing presents a continuation of Mumbai’s infrastructural pathway and a consolidation of mobility patterns. However, digitally

mediated mobility services that target the upwardly mobile middle classes also allow a larger part of the urban population to practise lifestyles that were once reserved for the affluent. This demand for convenient, comfortable and safe automobility could possibly result in the different realities of living in Mumbai becoming even further detached.

For many decades, taxi drivers in Mumbai enjoyed a favourable reputation, especially as the services they provided were considered vital to the functioning of the city, thereby contributing to the iconic status of the *kaali peeli* (the black and yellow taxi) in the city (Bedi, 2016b; Sharma, 2019b). Drivers of Mumbai’s conventional taxis often belong to distinct ‘motoring communities’ (Bedi, 2016a: 1014) based on ethnicity, religion and origin. These communities reduce entry barriers for labour migrants and provide them with access to resources and accommodation. Taxi operations are often not geared towards profit maximisation for individuals, but aim at distributing gains and risks equally among all members of the communities, thereby providing stability, security and resilience in livelihood provision, as well as a degree of independence from state intervention (Bedi, 2021; Samanta, 2016; Sood, 2012, 2014).

Communities of IPT workers possess substantial knowledge and experience about the local transportation system, which This allows them to provide regularity, predictability and familiarity in passenger transportation. Detailed knowledge about the city also enables them to flexibly respond and adapt their services to changing urban patterns as well as to diversifying mobility options and customer demands. In Delhi and Kolkata, where metro rail systems were extended or new routes created in recent decades, bicycle and motorised rickshaw operators have realigned their operations to the altered mobility landscapes and have become even more important as last mile

travel options (Murthy and Sur, 2023; Tiwari, 2014). In Mumbai, taxi associations are also very adaptive to local requirements, for example, running shared taxi routes on corridors of high demand or operating taxis that allow the simultaneous transportation of passengers and large goods quantities.

Due to its considerable size in many cities of the Global South, the IPT sector is also able to make a significant contribution to the alleviation of the climate emergency. In Dhaka, for example, small-scale networks consisting of transport workers, vehicle owners, merchants and technicians have been successful in developing electric rickshaws without government support (van der Straeten, 2022). Although raising a number of safety concerns, compared to conventional cycle rickshaws, these e-rickshaws not only allow improved comfort and higher incomes for drivers, but also present a low-carbon alternative to conventional fossil fuel rickshaws (Khan et al., 2022). Similarly, the ongoing transition of the rickshaw sector in Delhi towards electric rickshaws shows that transportation workers are willing to adopt new technologies, if they receive adequate support from governments, and these alternatives provide better livelihood opportunities and working conditions (Priye et al., 2021).

However, for decision-makers, globally oriented middle classes and urban elites in cities around the world, IPT workers have increasingly become perceived not as valuable contributors, but as a 'nuisance' and threat to global aspirations, world-class aesthetics and corporate formalised economies, leaving these workers marginalised or even criminalised (Rekhviashvili et al., 2022; Rekhviashvili and Sgibnev, 2018). As a result, workers in Mumbai's established IPT sector, especially *kaali peeli* drivers, consider the platform companies as competitors and a threat to their independence as operators. Due to these sentiments – as also has been

observed in other Asian cities such as Phnom Penh and Bangkok (Jack, 2020; Sopranzetti, 2022) – taxi unions and associations protested against the introduction of mobility platforms in Mumbai and many drivers also refuse to work on the platforms (Kuttler, 2023a; Kuttler, 2023c). In the following paragraphs, based on my own fieldwork, I investigate the current role and position of platform taxi drivers, thereby taking a closer look how they are embedded in networks of pre-existing IPT services. Thereby I seek to shed light on the potential of transport workers to (continue to) play a meaningful role in shaping socially inclusive urban spaces.

Methodology

This paper draws on fieldwork conducted between January 2019 and February 2020, prior to the alterations that COVID-19 pandemic brought to everyday life in Mumbai. The fieldwork included observations, interactions, and in-depth interviews with drivers, vehicle owners, fleet managers, passengers, representatives of authorities and platform companies, planning experts and urbanists.⁵ The fieldwork was complemented by a review of relevant documents and newspaper articles. Initially, the location of the fieldwork was primarily the eastern suburbs of Mumbai (mostly M East ward). This area was chosen due to its central location in the metropolitan region, good connectivity by road and rail, and because there are conventional taxi stands located at many railway stations and major road junctions. Additionally, the eastern suburbs are in close proximity to major white-collar employment centres such as the Bandra-Kurla Complex. Vehicle driving is one of the major sources of income in this area due to a high number of low-income settlements (Bhide, 2015; Nainan, 2008) and a large migrant population (Contractor, 2012). For

migrants and low-income groups, community affiliation plays a key role in determining which employment sectors are engaged with (in this example taxi driving) but is also important for finding housing arrangements in Mumbai's low-income settlements. Accompanying and observing drivers at their places of habitation allowed me to better understand drivers' experiences and motivations, as well as their biographies and social networks. For contextualisation of the socio-spatial conditions of taxi driving, I conducted further research in central and southern Mumbai, the western suburbs and the wider metropolitan region. Research participants amongst platform workers were initially recruited through the personal contacts of friends and acquaintances living in the eastern suburbs of Mumbai, and subsequently snowball sampling was used to contact more drivers and vehicle owners that lived in other parts of the Mumbai metropolitan region. Interviews and observations were conducted at railway stations, malls, office complexes, taxi stands, gas stations and driver shift change sites, but also in neighbourhoods and in drivers' homes. I also took numerous rides with platform and conventional taxis across the metropolitan region.

Platforms and their workers: An asymmetric relationship

In my fieldwork conducted prior to the COVID-19 pandemic, I observed that platform taxi drivers in Mumbai experienced high levels of vulnerability, insecurity and uncertainty. With an increasing share of commission deducted by the platform firms and gradually decreasing bonuses for drivers, a growing number of drivers could not pay their loans and rents or meet the financial expectations of their families at home. As a result, drivers started to compensate for these shrinking payments by working longer

hours. I frequently met drivers who, in the recent past, had been logged into the platform system for 14–17 hours a day.⁶ Many drivers were visibly sleep deprived and expressed that they were facing physical and mental health repercussions. Besides having little power to determine the conditions of their work, drivers complained that platform firms do not inform drivers of a passenger's destination when they accept the trip.⁷ Especially during rush hours, such 'information asymmetries' (Shapiro, 2020) forced drivers to conduct time-consuming or otherwise undesired trips. Many platform drivers expressed their confusion about incomprehensible platform features and inconsistent or arbitrary processes. Commonly mentioned malfunctions and ambiguities were related to the GPS, digital billing and payment, the incurring of cancellation fees, the modalities of surge pricing, *priority zones*,⁸ the *going home*⁹ option and the various bonus schemes. Due to drivers' constant hassle with the platform mechanisms, many felt that the platforms were playing a cat-and-mouse game with them. Platform firms frequently asserted disciplinary measures on drivers, and regularly adjusted their systems by fixing glitches, changing algorithms or adjusting the criteria for bonuses. With the introduction of large platform fleets in Mumbai in 2017,¹⁰ platform firms also established a new layer of driver control and surveillance, with fleet managers and vehicle owners monitoring the locations of their cars and drivers in the app, and additionally supervising their drivers by calling them on their phones and attending the driver shift change procedures.

Driver communities appropriate the platform

Platform work in Mumbai is highly collaborative and socio-spatially connected in order to make the mobility services

operational. Since platform drivers in Mumbai are mostly migrants from other parts of India, it requires intensive networking to get started as a platform worker. For new drivers, networking is necessary to gather financial support, access a vehicle, gain knowledge as a driver and find a place to stay in the city. Decisions to become a driver on digital platforms and to invest in platform-attached vehicles and fleets are often made along community lines. Community-based networks that were already active in metred taxi driving in Mumbai have expanded and adapted to platform operations. Besides building upon existing communities active in taxi driving, there has also been an emergence of new driving networks without linkages to the established metred taxi sector. I observed that in the context of platform fleet operations, new groups consisting of fleet managers, vehicle owners and drivers emerged. From 2017 on, small-scale investors from diverse backgrounds without prior connection to the taxi sector – such as members from established business communities in Mumbai or business school graduates – started to initiate fleets and operate them on platforms. They assembled their fleets by integrating owners and drivers of conventional taxis – who also brought their knowledge of the taxi trade to the fleet – and recruited new drivers via community channels. A fleet operator was explaining to me in 2019: ‘At the moment, we have three groups that refer good new drivers to us, one from Pratapgarh, one from Allahabad and one from Pune, people who work hard and are of kind behaviour’. Another fleet owner confirmed:

There are so many people that want to drive, they are always in the waiting line. My name is known in my community in Uttar Pradesh as one of the biggest fleet operators. This has the benefit that I am being trusted as a businessman.

Such associations of established networks with new actors are characterised by the flexibility of the fleet networks to partially define their own terms of operation, not only regarding the selection process of drivers, but also regarding drivers’ working conditions, levels of remuneration and bonuses. Larger fleet networks also have stronger bargaining power with the platform firms and can interrupt platform operations in the city when they seek to negotiate the terms with the platforms. Fleet operators keep shifting their cars between the two large competitors in Mumbai, according to which platform firm is offering better conditions and benefits.

Dissatisfaction with the two dominant platforms in Mumbai is also a result of drivers’ own perceptions of their statuses and roles. For most interviewed drivers, their livelihoods and personal aspirations were the prime motivators for doing platform work. However, among many veteran drivers from established motoring communities, a sense of pride prevailed about being a taxi driver. They perceived their occupation as service and duty to the city, its residents and communities. In Mumbai, it is common that conventional taxi associations actively contribute to neighbourhood festivities, including making donations. Drivers who had previously worked in the conventional taxi sector bemoaned that in platform taxi driving esteem for the driver’s occupation as well as the sense of responsibility and local attachment of drivers shrinks.

The linkages between platform and conventional taxi driving are also visible in the solidarities of platform drivers with their colleagues driving conventional taxis, and vice versa. Deteriorating working conditions for drivers and the shrinking prestige of the occupation affecting *all* kinds of drivers were the main reasons why drivers frequently expressed that ‘we drivers are all in the same boat’, and subsequently accused both the

state and the platform firms for neglecting their concerns. The fact that drivers also frequently switch between different forms of driving – app-mediated, street-hailed or as a private driver, with different vehicles during different times of the day – also contributes to these solidarities. Lastly, it is important to consider that platform and conventional taxis use the same ancillary services in Mumbai, such as banks for providing loans, car repair shops, spare part dealers etc. In a highly informalised, trust-based urban economy, these service networks are indispensable. Overall, these interconnections and solidarities rather create a picture of *one* taxi sector in Mumbai, instead of two sectors divided into conventional and platform-mediated taxi driving.

Local networked knowledge in platform taxi driving

Even though driving directions are provided via GPS, platform taxi driving requires local knowledge and experience that is continuously shared among drivers. Many middle-class and elite housing colonies in Mumbai, in addition to university and other campuses that are common passenger sources and destinations, are gated and walled. Transporting passengers to and from places in these gated areas complicates navigation for drivers due to the access barriers for non-residents, but also erroneous cartographic representations and inaccuracy of GPS in these private spaces. Similar complication arises due to the circumstance that the connectivity of Mumbai's road systems often changes overnight, for example due to metro rail construction along major thoroughfares or for political rallies. Such changes are often not represented in real-time in the cartographic system. In all these cases, drivers rely on conventional taxi-driver knowledge and instant communication with colleagues over phone to be able

to quickly find alternative routing. One driver explained:

When we go in a certain direction during rush hour, I would call my friends, and they would say 'don't take this or that route today, it is too congested'. In the same way we are able to manage the monsoon season, we are constantly informing each other about flooded roads.

Clearly, mobility platform work is highly interactive. Drivers regularly connect with each other during or after shift changes, in messenger groups, in conference calls during their rides, but also at tea stalls and mosques.

Platform driving also requires knowledge about how different infrastructures and public spaces can be utilised to create mobility services, and when they can be accessed. Dedicated spaces where platform taxi drivers can rest, eat or wait for passengers do not exist in Mumbai (with a few exceptions). In inner city Mumbai, where public space is notoriously constrained, parking and even temporary stopping at the roadside can be problematic and often results in penalties from the traffic police. As such, drivers need to negotiate access to space for parking vehicles, a procedure that – like for many other types of services that need access to public space such as street vending – requires experience, collaboration and investment of resources in the form of social capital. This can be illustrated with the example of car cleaning: in order to clean the car on the roadside near a water body, drivers need to align the timing of car cleaning with traffic volumes but also with the police's goodwill towards such activities, usually in the in early morning hours. Near one of the upscale office complexes in the city centre, traffic police only allow ambulant car cleaning by juvenile groups from adjacent squatter settlements during the 'invisible' night and early morning hours.

Drivers' housing is another important infrastructure that supports platform operations.

Via networks of drivers, vehicle owners and trusted landlords, accommodation for newly arriving migrant drivers is arranged near the places of driver shift change, where platform taxis are handed from the driver of the day shift to the one of the night shift (and again back in the morning). Since migrants usually arrive in Mumbai without their families, it is very common for them to stay in board and lodging places known as *khanawalis*.¹¹ Thereby, Mumbai's spatial reorganisation in the last decades is favouring today's mobility platform operations. Since large tracts of former mill land in central Mumbai have been converted into premium real estate, today many places of upscale residence and white-collar employment are situated right next to low-income workers' housing (*chawls*) and squatter settlements (*zopadpattis*). Also, in the wider MMR, new residential areas for the middle classes have emerged in close proximity to settlements of low-income and migrant groups that work in the IPT sector.

Practices to adjust working conditions and make additional gains

Drivers also use their knowledge, experience and channels of communication in attempts to better organise their work schedule according to their requirements. One strategy to earn additional income without having to pay taxes and commission to the platforms is to seek rides 'off-platform'. Drivers engage in street hailing, which, however, provokes confrontation with drivers of conventional IPT services, especially when conducted near taxi or rickshaw stands. As a result, platform drivers have found ways to access 'private jobs' – as they refer to such rides – via different methods, for example, by waiting in areas that taxis and rickshaws do not serve. Alternatively, they try to gain the trust of customers too, with the objective of becoming the passenger's regular driver

for non-platform mediated commuting trips – a form of driver–passenger relationship that is very common in the metred taxi sector in Mumbai. In addition, drivers try to establish such relationships of trust for whole-day bookings, especially for weekend trips. For the same purpose, drivers also organise in messenger groups to arrange and forward booking requests, for example, for trips to popular weekend destinations outside Mumbai.

I observed how drivers were vigilant observers and analysers of how platform algorithms function and how they change. Drivers use such knowledge to make small adjustments to their everyday driving schedules. Many drivers have established a practice to call or message passengers after the bookings are made via the app, inquiring about destinations and cancelling in cases where rides promise to be unprofitable. In response to passengers' furious reactions to these practices, platform firms have resorted to sending push messages to drivers to prevent them from cancelling rides and black-listing 'misbehaving' drivers.

The actions taken by drivers in efforts to make additional gains or to relieve the pressure of the work are also ways to alleviate the deskilling and social isolation mechanisms of platforms. Since platform firms are constantly advancing their control and surveillance strategies, practices of drivers that circumvent or reinterpret platform provisions are mostly marginal and seek to stay under the radar of platform firms.

Conclusion: Is there potential for bottom-up platformisation?

Drawing on the above observations made during fieldwork, what opportunities for bottom-up platformisation exist that would benefit both platform workers and support sustainable and just urbanism? As highlighted for the case of Mumbai, transportation

workers' knowledge and experience in building collaborations and social networks provide resources necessary for urban mobility services to function properly. Therefore, transport workers are essential actors in efforts to build more accessible and inclusive cities. Workers and their communities should be publicly supported in building digitally mediated, integrated public transportation systems that combine street-hailing and app-mediated hailing, that are able to alternate between collective and individual transportation according to demand, and that also take the logistics of goods and food within the city into account – all vital services that transport workers have provided for decades without digital support. Thereby platform mobilities could serve larger and more diverse user groups, and public institutions could foster local accountability and economic circuits while countering the increasing 'super-appification' and creation of conglomerates in the platform economy (van der Vlist et al., 2024).

Until now, locally based platform alternatives facilitated by municipalities or taxi unions have often failed in environments that are dominated by a few big capital competitors, and they have also failed in Mumbai so far.¹² However, in light of the drastic consequences of the COVID-19 pandemic and the cost of living crisis for transportation workers, local and regional governmental institutions in India are increasingly protecting and supporting the IPT sector and its workers. In Mumbai, the Maharashtra state government initiated a stakeholder consultation that brought taxi and rickshaw unions, platform firms, state institutions and consumer organisations together to facilitate deliberation about a fairer and more inclusive transport environment (Khatua et al., 2017).

Apart from interventions in the regulatory sphere, the fieldwork exhibits the important contribution of platform work to

the urban economy, and directs attention to the growing presence of platform workers in the city and their use of urban space. In this regard, it is important to investigate platform workers' requirement for adequate accommodation near the areas of operation, a prerequisite for decent working conditions in the platform sector *and* for effective platform services. However, the link between platform work and decent housing provision has attracted little regulatory and scholarly attention yet.¹³ In Mumbai, metred taxi and rickshaw drivers (via their unions and associations) have been able to establish and maintain dedicated taxi and rickshaw stands in decade-long negotiations with municipal authorities, and even managed to form a housing society to provide (a small share of) drivers with secure housing. Apart from housing, use of and access to centrally located public places is essential to ride-hailing workers. These places are usually claimed by different user groups (such as drivers, street and food vendors), and ride-hailing workers need to share adequate spots to park vehicles, wait for customers and take undisturbed rest with their street-hailing counterparts. Additionally, such spatial claims compete and are confronted with middle-class and elite groups' efforts to redevelop and transform Mumbai's spaces for commercial or other exclusivist gains (e.g. Parikh, 2021; Sankalia, 2019). However, with limited collective representation, such spatial claims are yet denied to drivers of app-based mobility services (and other platform workers). Most governments meanwhile accept globally operating ride-hailing firms as legitimate actors in the local economy. It remains to be seen whether transport workers can successfully leverage their affiliation with these firms in claims for urban citizenship, a form of contested legal recognition that is often the basis for accessing (formal) housing space in Mumbai (Jha, 2020).

The central and regional governments in India also introduced legal measures to protect the interests and livelihoods of drivers in both the established and the platform-mediated IPT sector (Sharma, 2019a). As part of local experimental coalitions with platform companies, Indian state institutions sought to create benefits for workers, and initiated COVID-19 responses, such as emergency food delivery to migrant workers and elderly people (Surie, 2021). While governments hitherto often feared negative effects to economic growth and innovative capacity when setting boundaries to the platform economy (e.g. Brail, 2017), such experiences illustrate that governments shift their policies surrounding digital mobility platforms. They are becoming more supportive of local initiatives and are even initiating their own platform programmes. In Kerala, the first state-wide public ride-hailing platform started operating in August 2022. In Bengaluru, a new mobility platform – a local collaboration between auto unions and a software company – has gained a substantial market share since starting its operations in November 2022. Although it has struggled to gain traction in Kerala (George, 2023), and is currently experiencing setbacks due to conflicts over decision-making procedures in Bengaluru (Devaiah, 2023), these initiatives nonetheless provide important lessons for locally developed and managed ride-hailing apps in other regions, such as those in West Bengal and Assam, and a state-driven platform in Karnataka (Nagriika, 2023). No doubt these initiatives are less about creating more democratic and inclusive mobilities than creating new ‘marketplaces’ for private investment (Stehlin et al., 2020). Hence, platforms that are initiated or supported publicly or by cooperatives may equally foster ‘reproduction of Silicon Valley’s own vision of the good life’ (van Doorn, 2017: 910). Yet, these developments nonetheless exhibit that governments are increasingly successful

in providing frameworks to curb the power of big capital platforms, protect platform workers and leverage the platform economy for the majority of urban dwellers.

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Notes

1. Uber is promising to become a fully zero-emission platform by 2040, and all rides with Uber in the US, Canada and Europe will take place with electric vehicles by 2030 (Gromis, 2021: 1).
2. Evidence from the US suggests that ride-hailing increases overall vehicle miles

- travelled and, therefore, aggravates street congestion (Clewlow and Mishra, 2017).
3. Platform firms refer to their drivers as 'entrepreneurs', advertising flexibility and adaptability as a major benefit of their occupational model, see also Kuttler (2023b).
 4. Uber operated in more than 125 cities and Ola – Uber's main competitor in India – in more than 200 cities in India by the end of 2023 (Ola, 2024; Uber Newsroom, 2023). The number of mobility platform taxis increased from roughly 10,000 in 2014 to 75,000 in 2019 (Korde, 2019a, 2019b; Rao, 2019). Additionally, more than 200,000 licenced auto rickshaws operate in Mumbai.
 5. A total of 74 in-depth and 48 short interviews as well as 32 informal conversations were conducted.
 6. Many drivers kindly showed me their driving statistics in the app.
 7. In 2022, platform firms had meanwhile changed this provision in Mumbai.
 8. *Priority zones* or *demand areas* are parts of the city that the platforms temporarily and dynamically designated as locations where drivers can achieve higher payments for conducted trips.
 9. When a driver selects the *going home* option, a customer request with destination close to the driver's registered residence is assigned to the driver.
 10. Fleet operators aggregate between 100 and 200 taxis and drivers in their fleets.
 11. It is common that several drivers share one room (up to eight persons, food not necessarily provided), reducing the monthly rent to around 5000–6000 rupees (roughly 70–85 USD, 2019), but possibly to as low as 2000 rupees (28 USD, 2019).
 12. In 2016 and 2017, local taxi unions temporarily introduced their own smartphone applications.
 13. The limited attention to this issue is highlighted by Metawala et al. (2021) who discuss the 'housing question' with regard to migrant workers on delivery platforms in Barcelona.
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