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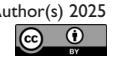

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From platform capitalism to strategic place-based platformisation?

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Abstract

Digital platforms have pervaded a broad sweep of urban life over the last decade and more. Urban mobility platforms have been particularly prevalent, often seeking to disrupt and provide alternatives to the existing organisation of provision. In this paper we argue that there is a need to strengthen understanding of the role of urban (governing and infrastructural) context in platform urbanism. Moving from debates around platform capitalism, where understanding of the role of the urban is relatively ignored, to platform urbanism, where the mutual shaping of platform and urban has been recognised, we argue that the urban can and should be conceived of more strongly as a site of possibility, where platformisation can be strategically shaped in pursuit of public priorities. The implications of this are potentially profound but poorly understood. We respond to this by developing a framework that extends existing thinking in this area via a critical synthesis of platform capitalism and platform urbanism literatures, illustrated by empirical research in two English metropolitan public transport contexts. There are signs of place-based interests seeking to corral platform technologies and existing systems of provision into new configurations that support public control of platformised systems for the pursuit of public priorities and values. We set out the relevance of the framework for contexts beyond those in which we have conducted research.

Keywords

Place-based, platformisation, strategic

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Introduction

The huge growth, in recent years, of the operation of digital platforms in urban context has been met with a rapidly expanding literature on 'platform urbanism' (Barns, 2020a; Caprotti et al., 2022; Graham, 2020; Hodson et al., 2021). The importance of the literature on platform urbanism is that it recognises the possibilities for digital platforms and urban context to be mutually shaping (Rodgers and Moore, 2018). In other words, it recognises that the analytical gaze need not primarily be on the digital platform as an organisational or institutional form (Frenken and Fuenfschilling, 2020; Gawer, 2014; Rahman and Thelen, 2019) but that urban (governing and infrastructural) context becomes important to shaping and being shaped by digital platforms. Within the broad body of work on platform urbanism, there is recognition of the importance of existing urban institutional, infrastructural and governing arrangements and that these may vary in the ways in which they are socially organised in relation to digital platforms (Graham, 2020).

It is in the area of urban mobility that platforms have been particularly prevalent, often seeking to disrupt and provide alternatives to the existing organisation of transport and mobility provision. In this paper we argue that there is a need to strengthen understanding of the active, strategic role of urban (governing and infrastructural) context in platform urbanism. In debates around platform capitalism (Srnicek, 2016), understanding of the role of urban context is relatively ignored, whereas in platform urbanism (Barns, 2020a) the mutual shaping of platform and urban has been recognised. Debates in platform urbanism exhibit a variety of perspectives, including that the urban is a parasitic site that is made amenable to platforms and where platforms seek to exercise control over places and have effects (Sadowski, 2020) or as places of resistance, where urban agency seeks to intervene and shape platformisation via exploiting 'glitches' (Leszczynski, 2020).

Undoubtedly, there is much to agree with in this. Yet, we wish to extend arguments in platform urbanism to recognise that urban (governing and infrastructural) context can be more strongly conceived of as a site of possibility and promise, where platformisation can be strategically shaped in pursuit of 'public priorities'. The implications of this are potentially profound. Platform capitalism has often meant private experimentation with new modes of mobility provision that have frequently been poorly embedded in existing systems of provision, with the potential to weaken strategic public control over urban public transport provision. Drawing on empirical research in two English urban public transport contexts, there are signs that place-based interests are seeking to corral platform technologies and existing systems of provision into new configurations (Hodson et al., 2017) that support public priorities. This argument sits in debates made in this journal (Stehlin et al., 2020) about variegated configurations of urban platformisation and the politics of who the key actors are that are shaping these trajectories. In particular, it seeks to extend understanding of the ways in which urban 'governmental fixes' (Stehlin et al., 2020) shape a platformisation trajectory whereby predominantly urban and national political actors organise platformisation to meet local, urban priorities, around, for example, economic competitiveness, social cohesion, and responses to sustainability concerns.

This form of strategic place-based platformisation is contested, embryonic and precarious. Configurations encompass multiple platformised service, infrastructure and datafication concerns, are a site of struggle, provisional and always in the process of being re-made. The struggle involves, on the one hand, an intensified role for private interests thinking of the city as 'a space to exercise dominion over' (Sadowski, 2020: 3). On the other hand, there is substantial and meaningful evidence of a re-assertion of municipal statecraft in shaping platformisation, where municipal bodies are reconfigured via building new internal capabilities and competencies and via new external partnerships (McGuirk et al., 2021).

In this context, we argue for the need for a stronger emphasis on urban context in platformisation processes. This also means it is important that strategic responses to urban platformisation take seriously that in actually-existing urban contexts, multiple (potentially contradictory) processes of platformisation are occurring simultaneously. In summary, our argument is: (1) for a new way of thinking about relationships between platforms and urban context; this is necessary (2) as the focus of what we study when we talk about platforms and urban context has changed; which (3) requires building better understanding of

the strategic shaping of place-based platformisation. Our contribution is to extend the platform urbanism literature by prioritising a focus on the shaping of platformisation by 'urban government', to enhance thinking of the platformised landscape that requires shaping and articulating key questions this raises.

We make our argument in four sections. In the next section we critically explore relationships between digital platforms and urban context, highlighting through literatures on platform capitalism and platform urbanism that whilst there has been a broadening of emphasis on to the role of urban context in the latter literature, this requires further work. In Section 3 we clarify the further work that is required through setting out our research questions and our methodological approach. In Section 4, we move on to develop a framework to build better understanding of strategic place-based platformisation and how this is differentially configured in relation to places. We illustrate this through reference to our two case studies. Section 5 presents conclusions.

Platforms and urban context

In this section we selectively and critically engage with the expansive literatures on platform capitalism and platform urbanism. Our interest is in critically summarising the role that urban context plays in these literatures.

The literature on platform capitalism and platform studies is wide-ranging (Kenney and Zysman, 2016; Langley and Leyshon, 2017; Srnicek, 2016). Central to this body of work is the role of digital platforms in informing changes to capitalist organisation. In this context, platforms have been seen to play a 'new' intermediary role in capitalist, economic circulations. Although the literature on platforms and platform capitalism is widespread, it is possible to identify four sets of issues that are of particular importance: what platforms 'are' (Cusumano et al., 2019; de Reuver et al., 2018; Gawer, 2014; Kenney and Zysman, 2016; Srnicek, 2016); platform ecosystems and relationships between platforms (Andersson Schwarz, 2017; de Reuver et al., 2018; Van Dijck, 2021); questions of power (Harracá et al., 2023); and the ability to shape platformisation and to shape societal futures (Schüßler et al., 2021), where it is recognised that there are 'choices' about platform design, 'at the level of society' (Kenney and Zysman, 2016: 69). Within this literature, the role of urban context remains underdeveloped.

Not only are platforms malleable and 'shape-shifting' (Schüßler et al., 2021), they also operate at different scales where 'despite their global reach, a key impact of platforms is their ability to operate hyperlocally' (McNeill, 2021: 3). It has been argued that global digital platforms are 'critical infrastructures of urban societies' (Barns, 2019: 1) but also recognised that there is a 'huge gap' in our knowledge of relationships between platforms and urban contexts (McNeill, 2021: 3). As a response to this gap, the concept of 'platform urbanism' has emerged in recent years (Barns, 2020a; Hodson et al., 2021). Primarily, the premise of platform urbanism is that there is mutual shaping of platform and the urban. The platform is both parasitic on urban context and as a new form of urban infrastructure is constitutive of the urban, where interest is 'in how the urban shows up in, through and as platforms; and at the same time, how platforms show up in, through and as urban' (Rodgers and Moore, 2018: np).

'The urban', in platform urbanism, is not singular and it has been understood in a variety of ways. Private platform mobility companies, such as Uber, Mobike and Lime, have mainly focussed their services and activities in urban centres. In doing this they have sought to capitalise on the potential of densely populated urban cores for generating the network effects that platform business models often promote and to be parasitic on existing, thick transport infrastructures in city centres. Historically, this has meant that cities have often been 'recipients' of platforms where the urban is a 'testing ground' or experimental site for 'data-centred digital systems that are purposefully designed as templates to be applicable across multiple towns and cities' (Caprotti et al., 2022: np). A consequence of this is that infrastructural mobility needs are often not being met by platforms in suburban and rural areas (Bauriedl and Strüver, 2020). Beyond the dominance of private platform companies, the 'application' of platform technology and its purposive, contextual shaping has also been promoted by public, place-based governing interests (Hodson et al., 2024; Stehlin et al., 2020). So, for example, Caprotti et al.

(2022) give the example of digital twins such as Virtual Singapore to argue that a particular 'type' of platform urbanism positions municipal authorities as central actors both at the level of service provision and in deciding how the platform functions.

There have also been contributions in the literature that have focussed on the mutual shaping of platforms and particular aspects of urban life. This has included how platforms and the geographies of digital work can produce 'seemingly-contradictory spatial tendencies' and ambiguities where urban workplaces are, 'both anywhere and nowhere' (Richardson, 2022: 79). Such ambiguities highlight the ways in which digital platforms – and the socio-technical arrangements that are configured to support their operation in a specific urban context – are constantly making and re-making urban space(s). Such a relational view of urban space (Massey, 2005) takes seriously how socio-technical arrangements are configured but also, by whom. To take one example, focussing on platformised car sharing and its relationship to homecaring, Bauriedl and Strüver (2020: 273, 274) argue that such platforms are configured to attract often young, male and relatively affluent users and that they 'contribute to a gendered production of space'. Developing their argument, they point out that urban division and problems can't be addressed by 'outsourcing public services to platforms'.

Platform urbanism has explicitly contributed to developing a more sophisticated understanding of relationships between platforms and the urban. The constant mutual morphing of platforms and urban context can be understood as bound up in relationships between platforms and making space productive to generate value from it. In this respect, platforms may be positioned as using 'underused resources' (e.g. in the case of mobility platforms this could include roads, footpaths, etc) to generate new forms of value. This is particularly so in a historical context of a post-2008 financial crash, awash with technological venture capital and where under conditions of austerity, cities and public authorities were often made amenable to reconfiguring key services. Thus, platform urbanism can be understood as an ideological agenda for reconfiguring urban services and urban space (Sadowski, 2020). 'Fix-thinking' (e.g. Sadowski, 2020; see Carraro, 2023) draws on Marxist approaches to highlight 'how platforms generate new opportunities for value-extraction through processes of disembedding, datafication and deregulation' (Carraro, 2023: 1). Emphasis is placed on platforms facilitating new rounds of capital accumulation through spatial restructuring.

Yet, this is only part of the story in that although '[u]rban platform economies change the consumption, perception and production of material urban space. . .this change is not only economically driven, but also practiced by citizens who shape urban structures from their smartphones' (Bauriedl and Strüver, 2020: 270). Thus, 'the use of digital platforms enrols the urban dweller as an active contributor in the continued shaping of urban space through distributed agency' (Odendaal, 2022: 21). The point being that 'it is evident that platforms function *across* space, but are rooted *in* place' (Caprotti et al., 2022: 12, original emphasis). One consequence of this is that platforms may exert control over urban interactions but without accountability, as they are simultaneously embedded and disembedded in urban context. Yet, this also points to potential weaknesses for platforms in that they can be avoided and replicated by alternatives (Graham, 2020).

In contrast to fix-thinking, 'glitch-thinking' (e.g. Leszczynski, 2020; see Carraro, 2023), with its roots in feminist, queer and Black media studies, 'performatively underscores the breakdowns and openings in the working of platforms'. Glitch-thinking seeks to open up what is seen as a reductive form of analysis to encompass a broader range of voices and perspectives. For a leading proponent of glitch-thinking it 'offers a necessary corollary – indeed, an erratum – to the totalising analytics of masculinist critiques which overdetermine the expanding presence of platform enterprises to be the catalyst of an imminent urban technopocalypse, the scale and inevitability of which may only be truly appreciated once apprehended in terms of logics of dialectics, late capitalism, and neoliberalism by those who demonstrate mastery of their maxims' (Leszczynski, 2020: 202). The fundamental point of difference in these approaches is that whilst 'fix-thinking highlights the role of platforms in furthering urban capitalism, glitch-thinking encourages us to envision how things could be otherwise' (Carraro, 2023: 1). Glitch-thinking explores the alternatives and practices shaping relationships between platforms and space.

This emphasis on heterogeneity challenges the dominance in platform studies and platform urbanism on large, global platforms such as Uber and opens up discussion of the possibilities of non-profit and socially-minded platforms. Numerous socially-minded and non-profit platforms have been promoted, including city-owned platform cooperatives and various other forms of cooperativism, such as union-backed labour platforms, where questions of ownership and control of platforms become central issues; where platforms and their services are in shared, community ownership (Scholz, 2023). The category of cooperative is also not singular and encompasses an 'ecosystem of platform co-ops' which 'is composed of an array of business, including small and medium-sized projects, as well as some with a per-annum turnover exceeding $200 million and close to 300 and employees many just starting with a business plan on paper, three founders, and a cat' (Scholz, 2023: 9). It allows us to ask questions of how we understand simultaneous experimentation with multiple digital mobility platforms in an urban context and the consequences of this in terms of transformation of existing urban transport/mobility systems. This also requires recognising relationships between platforms and cities and informal settlements in the Global South, where local alternatives to powerful platforms such as Go-Jek in Indonesia and Pathao in Bangladesh (Caprotti et al., 2022) have developed, but also where the imaginaries and challenges of existing and future urban life come together with platforms often in very different ways than those in the Global North. This may, for example, inform the platform mediating and bringing together urban precarity and multiple forms of informal urban mobility through an 'algorithmic suturing' which involves 'knitting together of the loose ends of splintered urban networks and informal economic activities through platform business models that visualize the last mile as a site of optimization and value creation' (Pollio et al., 2023: 959).

Platform urbanism develops a sophisticated view of the role of urban context. Yet, much of this work focuses on single or small numbers of platforms in relation to single or small numbers of urban contexts; there have also been contributions that focus on relationships between platforms in platform ecosystems (Barns, 2020b) and embedding platforms in urban space via partnerships (van Doorn et al., 2021). This view of the mutual shaping of platforms and the urban subtly privileges platform over urban context. It also underplays the possibilities for *strategic shaping of the urban landscape of multiple interacting platforms by public, urban authorities and interests.*

In this section, we have discussed how platform capitalism and platform urbanism literatures deal with relationships between platforms and urban context (see Table 1).

The constructive critique we have presented in this section speaks to the need to develop a new way of thinking about relationships between platforms and urban context where a distinctly *strategic place-based* platformisation, which recognises and builds on the insights of platform urbanism and its focus on mutual shaping, is required. One, that in particular, takes seriously the possibilities for public authorities strategically shaping urban landscapes of platformisation.

Methodology

Whilst there are flourishing literatures on platform capitalism and platform urbanism, place-based platformisation and the role of public authorities in strategically shaping urban landscapes of platformisation is poorly understood and requires research. Given the underdeveloped understanding of this area, two questions need to be addressed:

(1) How can we better understand, conceptually, strategic-place-based platformisation at urban scale?
(2) In what ways are public authorities seeking to strategically configure platformisation in particular places?

To do this, we focus on mobility/transport platforms, which have become pervasive in urban contexts over the last decade or so (Hodson et al., 2023). We aim to (i) develop a framework for understanding

Table 1. Platforms and urban context.

	View of urban context
Platform Capitalism	Intermediary role of platforms in capital circulations; key role for venture capital; underdeveloped view of the urban; but where there is the view that there are choices about platform design
Platform Urbanism	Mutually shaping, in theory, but where the platform is still – often subtly – prioritised
Strategic place-based Platformisation	Mutual shaping but where public authorities are more strategic in shaping urban landscapes of platformisation

strategic place-based platformisation; and (ii) build a more critical analysis of the role of public authorities in strategically configuring place-based platformisation, which we illustrate via empirical insights from two case-studies.

To address both questions, we draw on a programme of 80 semi-structured interviews with a range of interests, including representatives of combined local authorities, transport authorities, UK Department for Transport, transport operators and platform companies and document analysis of a range of strategy, policy and media documents, For question one, we draw on existing literature and empirical insights to construct a threefold conceptual framework for understanding strategic place-based platformisation. Analysis was iterative, moving between existing platform capitalism and platform urbanism literatures, data and emerging themes, seeing patterns in the data (Seal, 2016) and subsequently generating themes (Bryman, 2016). We used this understanding to extend an existing framework – the urban stack (Mattern, 2014; Shapiro et al., 2021) – to help us to better understand the ways in which public authorities are seeking to strategically configure place-based platformisation.

For the second question, we used this extended framework to critically engage with two case studies of public authority attempts to strategically configure place-based platformisation. The two case studies focus on the English 'city-regional' (metropolitan) contexts of Greater Manchester and the West Midlands.[1] The reasons for focussing on these places is that they provide a potentially fruitful way of understanding how public authorities are seeking to configure place-based platformisation, for three reasons in particular. First, both city-regions have been at the forefront of the UK government's efforts over recent years to promote a 'devolution' agenda where new governing arrangements ('combined authorities' and elected mayors) and new political geographies have been promoted (Sandford, 2020) and where local transport services and infrastructure are central to the 'deals' on devolution that central government has agreed with these city-regions.[2] These two city-regions were selected by the UK government as 'trailblazers' of 'deeper' devolution in 2022.[3] Second, both city-regions have relatively splintered (Graham and Marvin, 2001) existing public transportation systems, largely as a consequence of processes of privatisation and liberalisation in the 1980s and 1990s. Third, in a context of institutional and governing reconfiguration and fragmented public transportation provision, it is unclear how metropolitan public transport authorities are responding to the possibilities and the challenges presented by digital platforms (see Table 2 for a summary of these two city-regions). We have used two cases, rather than a single case, to illustrate the variegated nature of strategic place-based platformisation. In other words, strategic place-based platformisation is likely to tangibly manifest in places in different ways.

Given this combination of issues our approach to case studies is exploratory (Thomas, 2011), revelatory (Bell et al., 2022) and about creating compelling narrative in relation to our second question. It is exploratory in the sense that, a priori, we have 'little rounded knowledge' to be able to answer our second question (Thomas, 2011: 104). It is revelatory in that we use a case study approach to 'analyse and observe a phenomenon that has been previously inaccessible to scientific study but also where previously researched phenomena can be opened up to new, revelatory understandings' (Bell et al., 2022: 66). Our aim is to use these case studies, which are 'important for the development of a nuanced view of reality. . .' (Flyvbjerg, 2006, p.223)' to build better understanding in relation to our question. To do this we employ a summary, narrative analysis (Robson, 2024) to construct stories of the role of

Table 2. Greater Manchester and the West Midlands in summary.

	Governing	Public transport system	Platforms (data generated from our document analysis)
Greater Manchester	• 10 local authorities; c2.8 million • Formal metro governing arrangements and institutions abolished in mid-1980s • Post-1986 voluntary governing arrangements replaced by statutory combined authority arrangements 2011; elected mayor 2017	• Established multi-modal (bus, rail, light-rail) public transport system; Liberalised, deregulated, privatised in 1980s/1990s	• At least 70 transport/ mobility platforms operating between 2015 and 2022
West Midlands	• 7 local authorities; c2.9 million; 'Polycentric' organised around Birmingham, Wolverhampton, Coventry • Formal metro governing arrangements and institutions abolished in mid-1980s • Formal governing arrangements re-instated at 'new' geographical scale 2016; elected mayor 2017	• Established multi-modal public transport system around existing cities liberalised, deregulated, privatised in 1980s/1990s – but new 'city-region' geography means some pressures for re-scaled system	• At least 60 transport/ mobility platforms operating between 2015 and 2022

public authorities in place-based platformisation, selectively locating significant events, contexts and plots. These narratives are structured by seeing urban platformisation in actually-existing urban contexts as constituted through three levels of an urban stack: (i) urban services, (ii) urban infrastructures, and (iii) producers of data. Our research took place between January 2021 and December 2022. Methodologically, the breadth of functions and multiple kinds of platforms provided challenges as did the proprietary nature of some technologies and data infrastructures. This means that the narrative we produce is impressionistic rather than comprehensive.

Extending a framework to understand strategic place-based platformisation

Strategic place-based platformisation refers to purposive, public authority efforts to platformise the integration of existing urban public transport systems, to support the delivery of wider public policy priorities (e.g. supporting place-based economic growth; contribution to reducing carbon emissions). This section addresses how we can build better understanding of strategic place-based platformisation in relation to particular places. In doing so, our motivation is to demonstrate that public authorities, in the same national-state space, can and are shaping platformisation but that the ways in which they do so is variegated and built on differential historical infrastructural legacies and governing capacities. In short, strategic place-based platformisation is variegated in its constitution.

Over recent years urban platformisation has unfolded in two ways in particular. First, the dominance of technology and finance companies means that platforms have often been 'dropped-in' to urban context with the expectation that once a platform 'lands' then network effects in urban areas will expand the operation of the platform. This can be seen, for example, with multiple ride-hailing, bikeshare, e-scooter and car club platforms. Second, there have also been attempts to integrate multiple, largely private but sometimes public mobility platforms into private Mobility-as-a-Service (MaaS) platform systems by private platform organisations to extract value (what could be called a 'systems of extraction' approach).

Analytically, our approach explicitly broadens the field of social interests that are conventionally the focus of platform and platformisation thinking, from an emphasis on hardware and software interests, to encompass 'established' urban and metropolitan social interests. Taking the example of platformising metropolitan public transport systems, this means taking seriously the role of incumbent metropolitan public transport authorities, public and private operators and so on, who have key roles in shaping platformisation.

To conceptualise the dynamics and multiple actors involved, we turn to 'stack thinking'. The stack has been used as a concept in software development, where it provides a way of thinking collectively about assemblages of hardware and software (Shapiro et al., 2021). Stack thinking has been extended to the urban scale (Mattern, 2014; Shapiro et al., 2021) where the urban stack (US) has been used as a heuristic to understand how platforms are constituted as multi-layered assemblages of hardware, software and human practices. Taking inspiration from Koray Caliskan's work on seeing platforms as 'stacks', we recognise that. . . 'it is inadequate to describe platforms as mere digital infrastructures, devices, places or markets' and that it is important to view platforms and platformisation as 'stacks that weave multiple layers and types of interaction, and facilitate an empirically observable range of variegated economic activities' (Caliskan, 2021: 115).

To build better understanding of how strategic place-based platformisation is constituted (differentially) we, therefore, extend and illustrate stack thinking into a framework. Using platform capitalism and platform urbanism literatures and empirical exploration and interrogation, it is possible to see, impressionistically, how strategic place-based platformisation is constructed and how this varies between place-based contexts, even within the same national state context. This requires seeing and understanding platformisation not as 'ruptural' change but, in our case, as situated in how relationships between existing public transport services, infrastructures and knowledge are arranged in new configurations with platform technology. In that sense, platformisation is about (re-)configuring the 'old' and the 'new' and can be understood as socio-technical.

The multiple layers that this involves, in terms of platformising urban public transport, means that we have developed a 'stack' framework for place-based platformisation focussing on: (1) configuring urban services via platformisation (the transport/mobility services that are reconfigured via platformisation), (2) configuring urban infrastructures via platformisation (how existing and new forms of - material and digital - infrastructure are organised) and (3) configuring data via platformisation (how data and knowledge of the system is configured; see Table 3). We set out what the focus of each of these facets is and summarise how they can be understood in Greater Manchester and the English West Midlands. These 'city-regions' have been at the forefront of an agenda, over the last 15 years, of national state 'devolution' of powers and responsibilities, particularly in relation to public transport. They have also been sites of experimentation with digital mobility/transport platforms. In that respect, they provide useful contexts in which to understand strategic place-based platformisation and the varieties of its configurations.

Configuring urban services via platformisation

The platformisation of urban transport/mobility services means that a range of new and existing urban transport/mobility services can be accessed by users, usually mediated by a smart phone interface. This includes the provision of 'new' transport services, such as ride-hailing, car club, bikesharing and escooter platforms, as well as journey planning, mapping platform services and mobility-as-a-service functions which allow users to move 'seamlessly' across a given urban area. It also includes the platformisation of existing bus, rail, tram and other services. Such services involve new ways of organising the way in which the user engages with transport/mobility services.

There are many possibilities for how these multiple forms of urban service can be collectively organised at urban scale. At a technical level, digital platforms can expand their functionality via 'add-on' third party-designed applications (de Reuver et al., 2018). Via Application Programming Interfaces (APIs) platform services are able to interact and be coordinated with each other. This poses

Table 3. An extended urban stack and understanding strategic place-based platformisation.

	Focus	Greater Manchester	West Midlands
(1) Configuring urban services via platformisation	• Range of new and existing urban transport/mobility services accessed by users, via smart phone interface	• Addressing fragmentation of services via gaining control over 'conventional' public transport services in advance of platformised integration of services	• Attempts to integrate public transport services through a public authority-driven attempt to build a MaaS Platform; Preceded by a privately-driven attempt
	• New ways of organising user engagement with transport/mobility services	• Aspirations to re-enforce territorial integration via integrating services across the city-region	• Aspirations that transport service integration contributes to process of city-region-building
	• To what extent platform services remain disconnected from existing provision or are integrated with them	• In pursuit of stronger public governance and control over services, territory and achieving policy priorities	• Driven by new city-regional governing arrangements and institutions and pursuit of public priorities at that scale
(2) Configuring urban infrastructures via platformisation	• Range of infrastructures support platformised services in an actually-existing urban area	• History of experimentation to develop an app for accessing integrated transport services;	• Aim to integrate via private MaaS provider with their own software and hardware configuration, using existing public infrastructure
	• Requires focussing on three interrelated categories: hardware, software and existing urban transport infrastructure	• Involves experimenting with hardware and software-as-a-service providers (often outside the city-region and reconfiguration of existing infrastructure;	• Subsequent, efforts to build a publicly-controlled MaaS platform fusing 'back office' system of existing public smart ticketing card with a procured 'front-end' app
	• Multiple, loosely connected infrastructures or a more integrated platformised urban infrastructure?	• Constitutes strategic attempt at building 'deeper' integrated infrastructures	• Constitutes a clear attempt to build public authority, 'deep' integration
(3) Configuring data via platformisation	• Platform activity produces substantial amounts of data; and important to understand as data infrastructure (production, storage, communication and analytics)	• Seeking to move beyond seeing data as capital	• Seeking to move beyond data as capital
	• How is data infrastructure organised and by whom: as extractive capital or 'open' data-driven urban governance? • Is data organisation Balkanised or integrated?	• Recognition that the system and data is fragmented and therefore a commitment to integrating the system over time and experimenting with developing public data infrastructures, particularly via open data sources	• There is a pre-existing data infrastructure in the form of the Swift travel card back-office • Efforts to use data to understand users/riders via building archetypes.

challenges about what strategic organisation of platformised urban mobility service provision is desired and realisable in an actually-existing urban area. Drawing on literature from innovation studies, we can understand platforms as architectural and modular innovations (Henderson and Clark, 1990) in the sense that they change both elements of and linkages between different mobility services. A critical issue for public, urban authorities pursuing strategic place-based platformisation is to what extent platform services remain disconnected from those provided by existing systems and from each other. At poles of a spectrum there are ways of characterising the organisation of urban service provision as 'fragmented' and 'integrated'. Fragmented provision can be summarised as encompassing platformised urban services that are either disconnected from each other or loosely connected. Integrated provision is where services are more tightly coupled with each other.

The organisation of platformised services manifests in varying configurations in place-based contexts and over time. Strategic place-based platformisation, land-and-expand and systems of extraction co-exist in places but the balance between them has shifted between 2010 and 2024, from land-and-expand towards strategic place-based platformisation. How they are configured is shaped by the capacity to imagine the future of public transport services by place-based governing interests, the historical legacy of transport services in a place and the ways in which platform organisations see a place and its possibilities. In both Greater Manchester and the West Midlands public authorities have, over the last decade and more, drawn on socio-technical and spatial imaginaries (Jasanoff, 2015; Watkins, 2015) of *integrated* public transport services; but the legacy of fragmented services is arguably more pronounced in Greater Manchester, particularly with its multiple private bus service operators vis-à-vis the dominance of a single operator in the West Midlands.

This has meant that in Greater Manchester, in a context of fragmented public transport services, public authorities have sought to strengthen public control of existing services prior to developing system-wide platformisation. This has involved and continues to involve gaining control over 'conventional' public transport services to prefigure platformised integration of services across a networked geography of the city-region, but where platformised services are also seen as providing the potential for a variety of new urban spaces (Brenner, 2019), including the agglomeration-led development of its urban core and the servicing of this with a range of transport service options. Within particular parts of the city-region multiple land-and-expand platforms (e.g. Uber, Mobike, Lime) have been experimented with for different periods of time. As a category, there is often an ambivalence to whether these platforms disrupt and fragment existing service provision in a place or whether they complement and contribute to integration.

In the West Midlands, the aim is to integrate public transport services through a public transport authority-driven attempt to build a MaaS Platform. The sequence differs from Greater Manchester in that integration is driven by platformisation rather than platformisation requiring a process of gaining back public control of transport services, prior to it. In the West Midlands, this was preceded by a privately-driven attempt to integrate public transport provision by 'importing' a MaaS platform into the city-region. There has also been experimentation with multiple land-and-expand platform services (Co-Wheels, Nextbike, Voi) over the period. In a city-region whose current administrative boundaries are relatively new (2016), the aspirations are that platformisation and the transport service integration that it supports contributes to a process of city-region-building. In a context of relatively fragmented metropolitan governing arrangements prior to 2016, this is driven by new city-regional governing arrangements and institutions and pursuit of public priorities at this scale. As a configuration, place-based platformisation is underpinned by the pursuit of stronger public governance and control over services, territory and achieving policy priorities.

Configuring urban infrastructures via platformisation

A range of socio-technical infrastructures support platformised urban mobility services in actually-existing urban areas. This requires focussing on three interrelated categories of infrastructure: hardware (e.g.

the hardware of the cloud, server farms etc.), software (e.g. operating systems, algorithms, codes etc.) and those parts of the existing urban transport infrastructure that are incorporated into the architecture of a platformised infrastructure. The construction of new platformised services may involve not only hardware and software but also a reconfiguration and re-valuing of existing assets and infrastructures (e.g. use of pavements and forecourts of public transport hubs for bike docking stations; street parking bays for car club vehicles). Digital *platforms* can be seen at a general level as a complicated mix of software, hardware, operations and networks that are open to being built on and constantly evolving (Kenney and Zysman, 2016). The hierarchical and interdependent structures that maintain and evolve platforms are also power structures that enable and constrain strategies of vertical integration, infrastructuralisation and cross-sectorisation (Van Dijck, 2021).

It is critical for analysing strategic place-based platformisation that better frameworks are developed for understanding the ways in which the three interrelated categories of infrastructure are configured in relation to actually-existing urban contexts. Extending our focus on fragmented and integrated services, this raises questions as to whether we see an architecture that consists of multiple, loosely connected socio-technical infrastructures or a more integrated platformised urban infrastructure. Platformised urban mobility services that are loosely coupled to each other or disconnected are likely to result in multiple infrastructural configurations supporting platformisation of services in a place. This creates an inherent tension between public planning of infrastructures of platformised urban mobility systems and the ways in which multiple digital platforms may shape increasingly self-organising urban mobility systems (van der Graaf and Ballon, 2019). There is, in short, an openness to evolving platformised infrastructures. This raises three sets of issues in response to the challenges of how urban platformised infrastructures are organised. The first issue relates to the *extent to which* there is fragmentation or integration of platformised infrastructures in an actually-existing urban context. Second, is the *shallowness or depth* of infrastructure integration. Third, is who the coalitions of socio-technical interests are shaping the previous two points. Platforms may be uncoupled or loosely coupled to each other through APIs, resulting in fragmentation or 'shallow' integration. Where there is seemingly deeper integration of urban services – for example through mobility-as-a-service platforms – the issue is around how deep that integration is and to what extent there is integration of hardware, software and selective elements of existing urban transport systems. Where multiple service operators are involved this raises serious questions about the politics of platform architectures and whether a particular platform operator (e.g. a platformised private bus service, bikeshare operator or car club) might have their platform architecture integrated with wider urban platform arrangements (e.g. a mobility-as-a-service platform), on what terms, and who is in control of the architecture.

Efforts to develop place-based configurations of platformised services are not straightforward, often uncertain and involve ongoing experimentation with infrastructural configurations. In Greater Manchester, there has been a long history of experimentation to develop an app for accessing multiple, integrated transport services (a network plan was launched in 2018 but with a longer history of aiming for integrated transport). This has involved and continues to involve experimenting with hardware and software-as-a-service providers, outside of the city-region, to produce an app that either has or aims to have journey planning and payment functions across bus, tram, train, cycling and walking. This has also required some reconfiguration of existing infrastructure – for example, buses returning to public control; bikeshare infrastructure on pavements and at transport interchanges. Such a configuration of hardware, software and existing infrastructure constitutes a strategic attempt to experiment with building integrated infrastructures, that goes beyond 'shallow' integration and that, whilst being driven by metropolitan public authorities, involves building new relationships with hardware and software providers.

In the West Midlands, the aim to build integration via a private-provider MaaS platform was launched April 2018, with the MaaS provider, MaaS Global, using their own software and hardware configuration and attempting to fuse this with existing public transport infrastructure in the West Midlands. After the failure of this attempt to build the architecture for a system of extraction, efforts proceeded through the 2020s to build a publicly-controlled MaaS platform. This constitutes a clear

attempt to build 'deep' integration, driven by a public authority and via building relationships with relevant technological interests and expertise. This has involved fusing the 'back office' system of the transport authority's existing smart ticketing card with a procured 'front-end' app from FOD Mobility Group and their Mobilleo MaaS platform and also collaborating with other infrastructure providers and engineers (e.g. Unicard, WSP). In addition, in both Greater Manchester and the West Midlands, land-and-expand platforms have their own hardware and software configurations but draw on public roads, footpaths, interchanges and other existing infrastructure.

Configuring data via platformisation

Platform activity produces substantial amounts of data (Gawer, 2022) and can helpfully be understood through the lens of data infrastructure. This means it is important to see data in terms of data production, storage, communication and analytics, where data derives its value and use from particular configurations of technologies and institutions. Data can be generated, for example, about particular urban transport systems or parts of systems (e.g. via locational, usage, temporal and other forms of data about the movements of bikes in a platformised urban bike share system). Platform technology, by definition, is reliant on the engagement of users to generate data through their varied interactions with digital mobility platforms. The data generated is not just at the individual level but involves big data, algorithms and predictive analytics to shape choices for individuals.

In relation to urban context, the issue is how configurations of data infrastructure are organised and by whom. Whether, for example, the organisation of datafication is understood on the basis of data being extractive capital (Sadowski et al., 2021) or where there is resistance by city authorities to corporate control of urban data (Fernandez-Monge et al., 2023) and data is organised into new modes of 'open' data-driven urban governance (Barns, 2018; Kitchin et al., 2015; Lee et al., 2020). Platforms have opened-up the range of urban governing actors to include multiple 'new' interests, including tech companies, hackers and social movements (Vadiati, 2022). A consequence of this is that 'the public's interest in ensuring both the accessibility of information and services and the democratic control of data have taken on a new significance as private corporations, governments and civil society compete for control over these interests' (Bauriedl and Strüver, 2020: 267). This competition for control is one where data infrastructure may be organised in ways that is fragmented and that produces data Balkanisation, particularly if fragmented platforms are operating according to competitive and commercial logics. Alternatively, more integrated provision of urban mobility services and organisation of platform architectures may create conditions in which data is produced in a way in which it is available to be stored in a common repository and where the development of analytics capability can inform the manipulation and use of a potentially expansive data set.

In empirical contexts that we undertook research, public authorities are seeking to move beyond seeing data as capital. There is increasing recognition over time of the public value of data, for journey planning and for understanding how the system functions; but also recognising that the existing organisation of systems produces fragmentation of data. This means that building the purpose and infrastructure for producing, capturing and using place-based data is often uncertain and requires experimentation and learning over time. In Greater Manchester there is recognition that the system is fragmented and so is data and there is therefore a commitment to integrating the system over time and experimenting with developing public data and open data infrastructures to enhance movement about the public transport system and understanding of it. In the West Midlands, there is a pre-existing data infrastructure in the form of the Swift smart card back-office. There have been purposive public efforts to use data to understand users/riders via public officials building archetypes to understand user behaviours and usage patterns. In addition, the operation of land-and-expand platforms in both Greater Manchester and the West Midlands means that public authority access to data is frequently part of contractual arrangements; but access to such data doesn't mean that these forms of data can always be understood by public authorities.

Conclusion

In this paper we have engaged with debates in platform capitalism and platform urbanism to argue that urban and metropolitan contexts can be conceived of as sites of possibility and promise, where platformisation can be strategically shaped in pursuit of public priorities. In this context, our first question asked about how we can better understand, conceptually, strategic-place-based platformisation at urban scale. To answer this, we extended 'stack thinking' to develop a threefold way of understanding configurations of place-based platformisation and the extent to which place-based interests can shape platformisation in a framework to support research and analytical understanding of this issue.

We illustrated the use of this framework to address our second question: in what ways are public authorities seeking to strategically configure platformisation in particular places? We showed how the framework allows us to better understand not only the constitution of strategic place-based platformisation but also its variegated manifestations - through examples from Greater Manchester and the English West Midlands. In doing this, we recognise platformisation as being constituted by and having implications for urban transport/mobility services, digital and material socio-technical infrastructures, and data and its generation, storage and use. In developing this threefold understanding of strategic place-based platformisation, we have done so: (1) to theorise the variegated relational construction of urban context and a multiplicity of platforms; (2) in a context of multiplicity, to begin to draw out implications of the differential organisation of urban platformisation; and (3) to think through how urban and metropolitan public authorities do and may strategically shape urban platformisation in pursuit of policy objectives.

Making our argument has allowed us to continue a discussion about the various ways in which urban platforms and their relationship to existing context and forms of provision can be organised and to illuminate how urban government may intervene and strategically shape urban platformisation. We used existing literature and empirical material to develop a narrative of the differential organisation of configurations and the social interests at the forefront of shaping these. In drawing out implications of these configurations, we have sought to open up a debate around questions of (public) control in relation to urban platformisation in contexts where multiple processes of platformisation are taking place. This links to wider debates around whether urban platformisation is organised to extract value, as efforts to exercise dominion over an urban context and population or to build new forms of civic provision. More specifically, we have demonstrated a way of understanding how place-based processes of urban platformisation are organised and the social interests that are key to shaping these processes. This is a starting point and further work is needed to address in finer granularity the issue of how place-based interests seek to achieve forms of control via shaping processes of urban platformisation.

Furthermore, our focus on two English city-regions provided some initial insights into the variegated nature of strategic place-based platformisation. But, the framework can be applied and elaborated through further research to extend understanding of strategic place-based platformisation of urban and metropolitan areas in other national contexts (e.g. the French city of Dijon, with its 23 municipalities, aims to connect its transport (and other public) services to a digitalised 'central nervous system'[4]; or Singapore, where public authorities are seeking to control the platformisation of public transport.[5]

Whilst we constituted our argument through engagement with urban *mobility* platforms and the urban social and governing relations supporting this, debates around place-based platformisation are relevant for other forms of provision, including energy and food. In contributing to the literature on platform urbanism, our argument recognises that the place-based shaping of platformisation needs to take seriously the multiplicity of platforms operating in a given urban area. It also recognises that the mutual shaping of urban context and multiple processes of platformisation needs to be interrogated across interweaved configurations that take urban services, urban infrastructures and data infrastructures seriously.

Our approach to place-based platformisation is intended to be both academically rigorous and robust as well as being flexible and adaptable. In terms of future research, it is important to interrogate configurations of place-based platformisation in actually-existing urban contexts and to use empirical insights generated, alongside developments in the platform urbanism literature, to further refine our understandings of place-based platformsiation. Given that there are potentially many ways of organising urban platformisation, the underpinning challenge is how legitimisation of a particular way of organising place-based platformisation is accomplished. We have contributed to this endeavour via providing a means to critically analyse the specifics of the place-based shaping of urban platformisation, by urban government, in particular urban contexts.

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Notes

1. The West Midlands is sometimes characterised as a region as well as a city-region, this overlaps with but is different from seeing the West Midlands as a ceremonial county.
2. https://www.greatermanchester-ca.gov.uk/who-we-are/devolutionhttps://www.greatermanchester-ca.gov.uk/who-we-are/devolution https://assets.publishing.service.gov.uk/media/5a8169cbed915d74e33fe131/West_Midlands_devolution_deal_unsigned_final_web.pdf (accessed 16 December 2024).
3. https://assets.publishing.service.gov.uk/media/61fd3c71d3bf7f78df30b3c2/Levelling_Up_WP_HRES.pdf (accessed 10 January 2025).
4. https://www.consultancy.eu/news/5484/how-dijon-is-becoming-frances-leading-smart-city (accessed 10 January 2025).
5. https://govinsider.asia/intl-en/article/how-can-singapores-transport-deal-with-disruptive-tech (accessed 10 January 2025).

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