Socio-spatial and temporal dimensions of transport equity for London's Night Time Economy

McArthur, J.M., Robin, E. & Smeds, E.

The sustainable mobility paradigm has dominated the urban transport research agenda for more than a decade. This paradigm gives due consideration to the environmental impacts of travel and the imperative for climate change mitigation, however the specific outcomes of transport in terms of trip type and purpose are not yet robustly conceptualised, and limited intellectual foundations to understand the ethical considerations of transport planning and policy. This paper critically considers transport strategies recently developed for London's Night Time Economy, unpacking policy discourse and associated technical approaches that shape the provision of transport services at night. To advance more systematic critical perspectives on transport provision, the case study explores the spatiotemporal dimensions of equity. Analysis of policy discourses revealed how current policy strategies conceive of night time transport as an instrumental means to grow the 'Night Time Economy', drawing from the conventional wisdom linking accessibility improvements with economic expansion. This policy viewed 'London at night' primarily as a vehicle for economic development, focusing on the consumption-side of the economy and improving individuals' access to entertainment and recreation. Policy discourse recognised the existence of night-time workers in sectors outside arts and recreation, however attempts to broaden the 'Night Time Economy' agenda to accommodate this were lost through the narrow selection of accessibility metrics used in transport planning practice. This case demonstrates a missed opportunity to improve transport equity across spatial and temporal dimensions, as night-time workers face severe accessibility barriers, often relying on low-frequency, slow bus services that have inadequate spatial coverage of across Greater London. Scrutinising socio-spatial and temporal dimensions of transport provision can advance more systematic critical perspectives on transport equity by integrating a variety of distributional issues and linking more closely to the practical barriers faced by night-time workers to access transport.

Keywords:
Transport, equity, night time economy

1. Introduction

Urban transportation research has been dominated by the sustainable mobility paradigm for over a decade, eclipsing the traditional focus of transport planning and policy on travel-time minimisation (Banister, 2008). The shift to sustainable mobility has been slower to manifest in policymaking, as transport planning practitioners in many parts of the world continue to rely on outdated technical approaches promoting car dependency through a 'predict and provide' model of transport investment (Goulden et al., 2014, Jones, 2014). This discrepancy highlights how institutional responses to new policy objectives are mediated by the analytical tools used and their implicit assumptions. As we will argue in this paper, the same argument could be extended to the issue of socially equitable transport planning: despite accessibility planning having existed for some time, the uptake and use of such tools by practitioners has been limited (Papa et al. 2016).

As authors, we agree that climate change mitigation is of paramount importance with respect to society at large, and sustainable transport strategies have an important, if not fundamental, role to play. However, for decarbonisation to be delivered in line with other broader sustainability objectives such as equity, inclusivity and justice, understanding the framing of transport policy is crucial. In other words, current transport planning tools and approaches to sustainable transportation need to be critically evaluated against their inclusion (or exclusion) of different users' needs. Transport policy typically asserts transport infrastructure and services as essential to urban quality of life, as highlighted by this quote from London's current Mayor, Sadiq Khan:

> 'Transport is a cornerstone of my vision for a fairer, greener, healthier and more prosperous city… Transport doesn't only shape our daily lives and determine how we get around London – it can create new opportunities for Londoners and shape the character of our city.' (TfL, 2017)

However, statements like this obscure inherent distributional issues and give little direction regarding how transport policy prioritises the needs of different types of users, the types of opportunities that are created, and how tensions between environmental, social and economic goals are negotiated. To date, approaches to sustainable transport have continuously sidestepped the underlying political economy of transport provision. Given the fragmentation

of critical perspectives and dispersal of knowledge supporting transport policy, there is a need to advance more systematic critical perspectives on transport (Kębłowski et al., 2016). Following the aims of this special issue to re-connect the sustainable transport research agenda with explicit political-economic considerations, this paper examines the socio-spatial and temporal dimensions of transport equity and discusses how those considerations can act to integrate critical perspectives and inform a more rigorous mode of operationalising transport equity through sustainable and just transport planning. This does not imply that spatiotemporal dimensions of transport obfuscate or displace existing critiques around socio-economic disparity, age, gender, disability or race, but rather provide a common empirical basis to consider these issues jointly. Since transport accessibility is a function of land-use patterns as well as transport provision (Martens, 2015), making spatial dimensions explicit can usefully mobilise critical approaches by asserting the spatiality of equity and inequity (Soja, 2011). Going further to also introduce temporal dimensions highlights the time-critical nature of urban transport. The provision of transport services typically focuses on peak-hour travel, however, some social groups travel predominately during off-peak hours and are thus underserved by lower frequency services, poor connectivity and associated longer travel times.

This paper centres on the recent introduction of transport for the Night Time Economy (NTE) in London, in the form of Night Tube (London Underground) services along selected routes during the weekend. The plan for introducing Night Tube services was first announced by Transport for London (TfL) in 2013. The NTE policy agenda in London was initiated with the establishment of a Night Time Commission by Mayor Boris Johnson in 2016, which focused on the future of night-time venues. Over time, these two policy agendas have become linked, manifesting in the 24-hour vision for London, a policy strategy for London's NTE published in July 2017 under Mayor Sadiq Khan. Examining the case of the London Night Tube, introduced in 2016, allows for a critical contribution to transport studies that illuminates the embedded politics of a seemingly uncontroversial, progressive transport investment. Using a mixed methods approach, we hope to provide both empirical evidence and theoretical reflection regarding the ways in which transport policy and planning for the night-time in London account for spatiotemporal differentiation of mobility needs.

2. Sustainable transport and the night-time city

2.1 Integrating issues of equity and social justice for sustainable transport planning

Sustainable transport has become the dominant paradigm shaping transport policy and technical practices. While this approach has been slow to proliferate throughout the world, and many regions continue to operate according to the neoclassical paradigm, sustainability has become a taken-for-granted concept in policy rhetoric and amongst the 'best practice' disseminated by international agencies (Gudmundsson, 2003). However, the orthodoxy of sustainable transport, which purports to address environmental and social problems through a configuration of technological, planning and design interventions, depoliticises this process, by concealing the underlying political consequences of transport provision (Kębłowski et al., 2016). Politics infuses the design of transport strategies and investment decisions (be that investment location and or investment in different modes), which eventually influences who transport is planned for. Literature from critical geography unpacks the influence of political dynamics on public transport investment (Addie, 2013; Young & Keil, 2014) and calls for more attention to the social, political and economic relations underpinning transport provision (Schwanen, 2016). From these perspectives, ignoring the social impacts of transport provision, which arise at every level of decision-making, poses a large risk to social wellbeing and social justice (Jones & Lucas, 2012; Martens, 2016).

There is a growing body of empirical literature on the social impacts of transport infrastructure (Lucas, 2012; Lucas & Porter, 2016). However, in current sustainable transport policy strategies, 'transport disadvantages' are still poorly accounted for. As put by Hine and Mitchell (2001, p.319): 'transport policy has been shaped by the notion of a universal disembodied subject which has been aided by the reluctance of transport policy to include a social agenda to be addressed', and indeed, it is telling that minimising '*Generalised* Travel Cost' (GTC) has for long been the primary objective within the traditional transport planning paradigm (Banister 2008). Hine and Mitchell (2001, p.319) add that 'the creation of a barrier-free environment is important for equality of opportunity, yet transport disadvantages persist, particularly relating to issues of safety and accessibility for women (Law, 1999; Smith, 2008), children, older and disabled groups (Schmöcker et al., 2008) and deprived populations (Church et al., 2000; Welch, 2013) located further away from employment clusters. For instance, cycling is often purported to be the cornerstone of sustainable, multimodal transport strategies, but research has highlighted that the approach taken to develop cycling

infrastructure in the United Kingdom is more likely to benefit young, educated, male populations than women and the elderly (Aldred et al., 2016).

Advancing a critical agenda for transport studies also holds potential for clarifying questions about the fundamental purpose and distributional impact of transport provision. This paper examines the socio-spatial and temporal dimensions of transport equity to inform this agenda. A first and crucial step is to develop a more nuanced understanding of transport accessibility. Since most transport planning authorities only possess data on total volumes of traffic and operational statistics on public transport systems such as journey times between destinations, relying on survey data to understand the needs, preferences, and motivations of different users, there is a high level of uncertainty around the ultimate impacts of transport provision in terms of economic activity and individual wellbeing. Providers seek to provide more mobility and connectivity between locations that they deem important, with the aim of meeting societal needs. This uncertainty around the ultimate outcomes resulting from transport provision (Bertolini, 2012) leaves potential for misalignment between the type and extent of transport services, and the actual needs of individuals. It further illustrates the need to unpack the values embedded in existing policy tools and metrics used for transport planning, instead of treating them as neutral instruments of policy-making. Those calculative devices do carry with them a wide range of assumptions about what should be measured and how (Callon & Law, 2005), what and whom is deemed worthy of being included (and what is left out) in the policy design process (Robin and Acuto, 2018).

2.2. Linking socio-spatial and temporal equity issues to transport planning: the case of the Night-Time Economy

In what follows, we examine the socio-spatial and temporal dimensions of transport equity, focusing on a specific case of transport policy change aiming to support travel during the night. 24-hour and night-time strategies are increasingly popular among city-governments worldwide, and some have strongly emphasised the expansion of public transport provision at night. The night-time economy presents a challenge to existing paradigms for transport planning and governance, due to the nature of night-time economic activities and related transport needs: security and safety issues are different at night, and both workers and consumers display different travel behaviours. The NTE first emerged as a concept describing a portion of night-time economic activity comprising entertainment, cultural

activities and hospitality sectors in cities in the Global North (Bianchini, 1995; Shaw, 2010). In conjunction with policy trends seeking to reorganise urban centres around consumption activities, imperatives for competition between cities to attract investment and people (Lovatt, 1995), the NTE acted as a 'boosterist representation of these activities as a means to regenerate inner city areas' (Talbot, 2007, p. 1). More recently, Shaw (2014) highlights that the initial intentions of this concept were much broader than the focus on the 'night-time high street' that it fostered (Hadfield et al., 2001), and argues for more comprehensive understandings of the urban night, beyond these specific consumption activities and related economic opportunities.

This paper takes a different perspective on the NTE than most literature published to date, as it focuses on NTE workers. While literature on other sectors of the economy, such as knowledge-based services, focuses directly on improving transport services for workers through transit upgrades (Chatman & Noland, 2014), the NTE as conceptualised in policy focuses heavily on transport for economic consumers with scant consideration of night-time workers. Since those working at night face distinctly different constraints and potential mobilities than daytime workers, London's NTE transport strategy provides an appropriate case to critically scrutinise the socio-spatial and temporal dimensions of transport equity. Literature on time-space geographies has explored several lines of inquiry relevant to transport equity: Neutens et al. (2010) delineate between place-based accessibility measures defined by spatial separation, and people-based measures that consider individual space-time constraints and activities. Delafontaine et al. (2011) evaluate the impact of opening hours on space-time accessibility and found that individual time geographies differ across individuals and planning to maximise overall accessibility across a population can be biased toward particular groups. This is starkly evident in many major urban transport systems, such as the London Underground, which provide the highest frequency of services for peak-hour travel in the morning and evening. Literature has also explored the temporal dimensions of mobility of groups with specific needs: the notion of 'juggling' characterises the travel behaviour and time-space constraints of adults in dual-earner households, and Schwanen & de Jong (2008) assess how these multiple constraints shape mobility and accessibility. Kwan (2013) also proposes a temporally-integrated accessibility analysis that incorporates racial segregation and environmental exposure. This body of literature elaborates on the diversity of accessibility and mobilities across individuals and social groups, and the different factors that shape these, however very limited attention is given to night time workers, even though they

196 constitute a significant proportion of the workforce in many cities of the Global North and
197 South.
198
199 Finally, literature has established positive links between greater equality and economic
200 development, although there is limited evidence to support a causal relationship. Equity
201 considerations set out explicitly to support justice and a fair society give grounds for this goal
202 in itself, however we examine further whether equity considerations might also warrant
203 inclusion within the conceived transport-economy relationship. In doing so we acknowledge
204 that transport is a critical factor for participation in the labour market (Johansson et al., 2002),
205 and there are often stark inequalities in the level and quality of transport accessibility across
206 different areas of the city. Therefore, we contend that a critical agenda for transport studies
207 should attend to this issue of access to employment, as an area of transport provision with
208 significant political, social and economic implications. There is considerable literature and
209 empirical research on social-spatial and temporal equity with regards to transport
210 accessibility and mobilities, however scant consideration is given to these issues in literature
211 on the relationship between the transport and the economy, especially at night, as it is set out
212 by Banister (2008) for the sustainable mobility paradigm:
213
214 'Empirical research has concluded that the key parameters of the sustainable city are
215 that it should be over 25,000 population (preferably over 50,000), with medium densities
216 (over 40 persons per hectare), with mixed use developments, and with preference given to
217 developments in public transport accessible corridors and near to highly public transport
218 accessible interchanges (Banister, 2005; Banister, 2006)'
219
220 The expansion of activities in cities along the 24-hour cycle is relevant to broader reflections
221 on transport sustainability, notably as it offers opportunities for re-organising freight
222 activities at night to limit road congestion and/or test innovative use of public transport
223 infrastructure for moving goods and workers across large urban areas (Browne et al., 2012;
224 McKinnon et al., 2015). Transport strategies for 24-hour cities remain largely understudied,
225 especially in transport studies, hence our interest in unpacking their production. Highlighting
226 current 'blind spots' in current NTE paradigms and discussions holds the potential to find
227 opportunities for more user-friendly and equitable transport services. Our case looks into the
228 highly-publicised Night Tube services introduced in London in 2017 and examines the
229 implicit question: who is the Night (Tube) for? The realities of travelling at night in London

are particularly harsh for shift-workers commuting in the early hours of the morning, as illustrated in popular non-fiction such as *This is London* (Judah, 2017). Macarie (2017) used ethnographic approaches to explore the impacts of night shifts among migrant workers in London, showing how night workers experience physical exhaustion, isolation and lack access to modes of collective representation. In turn, this limits the ability of workers to advocate for a greater recognition of their rights and experiences in night time planning strategies. A recent report from the London Assembly (the elected scrutiny body of the Greater London Authority) highlighted that night-time workers often work in low paid jobs, and in particular, the report presented concerns with regard to these workers' access to "fair pay, a safe working environment, and access to safe transport options to and from work" (London Assembly, 2018, p. 6). Studies of night-time workers in other cities, such as Barcelona, show that women working at night suffer from the lack of direct transport to their workplace at night, in turn impacting on their safety and vulnerability within and outside of transport stations (Ortiz Escalante, 2017). Unpacking the production of London's night-time transport strategies therefore appears essential to understand whether or not they cater for the need of night-time workers. More broadly, this research contributes to illustrate that a first step towards theorising a sustainable transport paradigm that is sensitive to issues of equity and accessibility consists in assessing the policy discourse within which transport strategies are currently embedded.

3. Material and Methods

The case study evaluated in this paper considers the socio-spatial and temporal dimensions of transport equity for London's NTE. Our analysis proposes to explore the "work of framing" manifested in night-time economy discourses to question how London's night-time transport strategies attend to issues of socio-spatial disparities and inclusion. Policy frames integrate 'facts, values, theories and interests' and function as 'a way of selecting, organizing, interpreting, and making sense of a complex reality so as to provide guideposts for knowing, analysing, persuading, and acting' (Rein & Schön, 2012). Critically, frames themselves determine what counts as evidence, and how it is interpreted to support decision-making and planning. Our analysis offers new insights about the ways in which the transport-economy relationship is framed in policy discourses, allowing us to assess whether or not this framing contributes to the design of transport strategies that explicitly account for equity.

In what follows, we suggest that various elements in policy discourses contribute to framing

an issue (in this case night time transport provision) in a way that may result in the design of policy interventions that exclude specific user groups (in that case night time workers). Critical attention to policy discourse is important as we argue that policy interventions are shaped by conventional wisdom and institutional narratives about the purpose of transport policy is and who it is for. The analytical approach to unpacking policy discourse advanced by van Hulst and Yanow (2016) is adapted to elaborate on three facets of policy discourses: sense-making; selection, sorting and categorisation of phenomena; and storytelling. Firstly, sense-making is the rhetorical work of 'converting a problematic situation into a problem' (Schön, 1994) which allows various actors to abolish uncertainty on a specific issue, converting it into a situation that can be acted upon through policy interventions. Sense-making occurs through interaction between different actors (e.g. elected officials, transport planners, user groups, transport workers, etc.) and requires identifying a problem and its boundaries (what is) as well as potential desirable outcomes (what ought to be) (Rein and Schön, 2012). Secondly, once a problem has been identified, being able to select, categorise and sort relevant dimensions of that problem appears important to support the design of adapted interventions. This includes developing tools and metrics that allow identifying, categorising and, more importantly, prioritising different aspects of the problem (van Hulst and Yanow, 2016). This work of identification, selection and prioritisation helps to design various policy interventions and allow policy-makers to choose among different options. Lastly, storytelling binds together the rhetorical work of sense-making, selecting, naming and categorising into a legible causal and shared narrative, it communicates 'what needs to be done - past, present, and future - corresponding to the plot line of a policy story' (ibid., p. 100).

By articulating and critically evaluating the framing of the NTE for transport, we scrutinise the 'facts, values, theories and interests' that are inferred through transport provision for the NTE. Our analysis is based on the review of three strategic documents in the London context: the Mayor's 24-Hour Vision: 'From good night to great night' (Greater London Authority, 2017a), the Mayor's Draft Transport Strategy (TfL, 2017a) and the Business Case for the Night Tube (Volterra Partners, 2014). These strategic documents drew heavily from additional reports providing evidence to support the policy, including Impact of the Night Tube on London's Night-Time Economy (Volterra Partners, 2017), The Economic Value of London's 24-hour economy (Ernst & Young, 2016), Integrated Impact Assessment of the Consultation Draft Mayor's Transport Strategy 3 (Jacobs, 2017) and Draft Mayor's Transport

Strategy Evidence Base: Challenges and Opportunities Report, and Outcomes Summary Report (TfL, 2017b). Publicly-available reports by TfL provided important contextual information on night-time travel trends and current planning tools.

The Mayor's 24-Hour Vision and Mayor's Draft Transport Strategy were coded thematically to extract all fragments of text related to the NTE, associated transport interventions, equity and inequality. Coded text was subsequently analysed according to the three dimensions of framing 'work' articulated by van Hulst and Yanow (2016): Selecting, sorting and story-telling. Transport policy for London is accompanied by professional planning practices and tools that are critical to translate policy objectives into specific transport interventions.

While the Mayor's Draft Transport Strategy (TfL, 2017a) has significant shortcomings in relation to transport provision for night time users, it has to be acknowledged that this document does not capture or represent the full extent of transport policy and planning in London. Indeed, as a high-level policy document, it is inevitably limited in detail, while more specific planning and implementation work is undertaken at TfL. However, public documentation on these more specific aspects of transport planning is not always available and our analysis is based on Greater London Authority documents. In what follows, we apply the outlined analytical framework to analyse night-time transport strategies in London, seeking unpacks the multiple dimensions of the 'work of framing' to better understand: 1) how transport policy is problematized in relation to the night time; 2) which tools are used to identify and prioritise relevant areas for policy interventions in relation to night-time transport planning; 3) how are those tools brought together into a coherent night-time narrative for London, and what does it tell us about the inclusion and exclusion of different types of users from current night-time transport planning strategies.

4. Assessing policy discourses of the night and sustainable transport strategies in London

4.1 Problematizing transport at night: transport as a means to boost the Night Time Economy

The Mayor's 24-Hour Vision identifies the objective of governing London at night as the development of the NTE, reflecting how the economic potential of the night-time hours are prioritised, amidst the city's global ambitions to become a 'leader in the way we plan for life at night' and maintaining the vibrant nightlife as a 'mark of cultural status for a global city' (Greater London Authority, 2017a). The 'economy' in the NTE is understood predominately as constituted by leisure activities provided by cultural, entertainment and food sectors, i.e. the consumption opportunities provided by the economy, rather than the production side and (re)productive labour such as health and social care, transport and logistics, and retail. This conceptualisation of the NTE reiterates earlier approaches within urban policy that focus mostly on recreation and entertainment at night and improving outcomes for economic consumers (Shaw 2010, 2014). Transport provision for the NTE is framed in terms of overall connectivity improvements, with very limited mention of strategic planning to link travel demand at night with the services provided.

The Mayor's 24-Hour Vision for London sets out ten principles for the city's development. Table 1 summarises the attention to transport needs within this strategy, illustrating the NTE's strong bias toward providing transport services as a means to access consumption opportunities, and enhancing the value of specific locations within the city. This document does acknowledge that night-time workers exist, however, instead of focusing on improved accessibility to employment, the strategy raises the need for night-time workers to access shops and services outside typical working hours. While the strategy highlights the need for safe transport for night-time workers, it largely conceals existing inequalities in the existence and quality of transport provision across spatial and temporal dimensions.

Table 1 – Attention to transport provision in Mayor's 24-Hour Vision for London (Greater London Authority, 2017a)

	Principle	Consideration of transport needs
1.	Be a global leader	*'We want London to be known as the most vibrant city on Earth … With a **growing creative population, great buildings, good transport at night and a positive agenda, we can achieve our ambition**.'*
2.	Provide vibrant opportunities for all Londoners, regardless of age, disability, gender, gender	*'To succeed, London's night time offer must be accessible, safe and attractive to all…. **Some people feel unsafe or find it difficult to get***

	identity, race, religion, sexual orientation or means	***around at night. We have to understand the barriers to enjoying London at night.'***
3.	Promote all forms of cultural, leisure, retail and service activity	*'Those employed in hospitals, call centres, transport or policing may work at any time of day or night.* ***Why should they only be able to access high street shops and services during day-time hours****?'*
4.	Promote the safety and wellbeing of residents, workers and visitors	*'We must protect night workers.* ***They have to be able to get to work and home safely.'***
5.	Promote welcoming and accessible nightlife	*'Our centres at night should be places for everyone. People of all ages, abilities and backgrounds should be able to arrive by any form of transport, including walking and cycling.'*
9.	Become a 24-hour city that supports flexible lifestyles	*'London is already a 24-hour city and not just for culture and entertainment. Many businesses and organisations, like* ***those working in health, policing and security, hospitality, transport and financial services, must operate at night.'***

The focus of the Night-Time Commission established by former Mayor Boris Johnson in 2016 was strictly on night-time venues. The 24-hour Vision broadens this agenda to an extent, with minor references to the diversity within the NTE, highlighting that "*we can also do more for our vital nurses, police, freight and transport workers whose shifts go through the night*" (Greater London Authority, 2017a, p.6). However, this broadened agenda was only partially incorporated into the Mayor's Draft Transport Strategy (TfL, 2017a). The Transport Strategy acknowledges that "*Londoners' travel habits are changing and off-peak, weekend and night-time public transport services also need to be better developed, enabling London to become a fully 24-hour city, with a strong night-time economy*" (p.126). Policy 17 of the Strategy states that "*the Mayor, through TfL and the boroughs, Network Rail and train operating companies, will seek the development of London's public transport services to support the growth of the night-time economy*" (p.185). While the transport strategy identifies the temporal changes in travel demand, it posits a direct link between the development of public transport services and growth of the NTE, without identifying what kind of trips transport provision is catering for.

Inferring a direct causal link between improved accessibility and economic growth is common across many transport strategies: evidence for this effect at the local scale is significant, albeit highly variable and dependent on local contextual factors (Melia, 2018). *Impact of the Night Tube on London's Night Time Economy*, a report prepared by Volterra

Partners (2014) for TfL and London First (a business member group) sheds light on the framing of the Night Tube as the chosen policy option for night-time transport, providing details on both the internal 'business case' prepared by TfL and the wider economic impacts estimated by Volterra. The report cites growth-boosting benefits including the estimated generation of 2000 permanent jobs supported by the Night Tube with "the net additional output produced as a result equates to an additional £360m as a Present Value over 30 years, which would increase the BCR [benefit-cost ratio] to approximately 3.9:1" (Volterra, 2014)., p.8), stating in addition that:

"*The way that the Night Tube can really add to the scale of economic activity and money circulating in the economy is by making London a more attractive place to live, work and visit – so that more people and businesses locate and invest here, and more tourists visit*" (*ibid.,* p.2).

In the documents analysed, transport infrastructure is framed as the key to expanding economic activity into the night-time hours. In line with the focus on consumption in the NTE, transport provision is framed as a question of ensuring access for consumers to the Central Activities Zone and other NTE 'hotspots'. Figure 1 illustrates the 'strategic clusters' of night time activity identified for the Greater London area, showing the local areas designated to be of international, national or local significance for London's NTE.

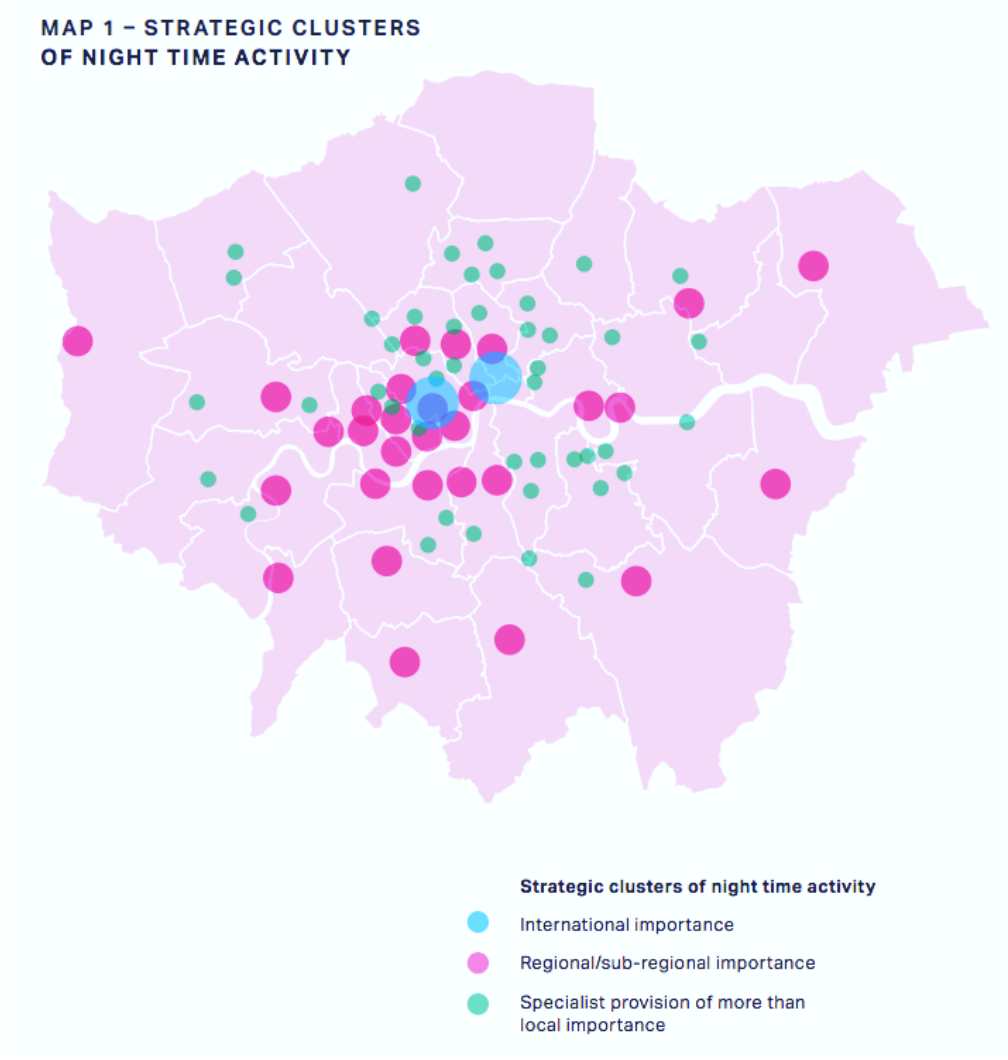

Figure 1 - Strategic clusters of night time activity (Greater London Authority, 2017b, p. 68)

These clusters are determined on the basis of current or hoped future growth in NTE-related activity, designated as part of strategic spatial planning for economic development in the 2010 London Plan, rather than any spatial analysis regarding current locations of night-time work as broadly defined (including productive sectors). Besides this spatial designation of London's centres and subcentres, there is very little focus on ensuring accessibility of locations (e.g. access to NTE employment clusters); instead, transport infrastructure is framed as an enabler of growth by improving general connectivity.

4.2 Analytical tools and policy interventions: catering for night-time consumers

Van Hulst and Yanow (2016) identify the work that policy discourse does to select and categorize, and critical perspectives can unpack the 'work' that policy frames do to highlight

and conceal specific phenomena and processes. In the context of transport provision, the use of analytical tools and technical practices to operationalise transport policy has a significant bearing on the way that policy objectives are ordered and selected when new investments or upgrades are planned.

Proposed transport policy interventions to support the NTE focus on the extension Night Tube services to include more lines, and the introduction of night-time services on the Overground (2017-2020) and Docklands Light Rail services (2020-2030). Bus services are only mentioned briefly: "Night Bus services will be adjusted to complement night-time rail services and areas with a thriving night-time economy" (TfL, 2017, p.185). However, recent TfL plans to cut down bus services (both day time and night time) have been released by several media and raised concerns about low-paid workers living in outer London's ability to access jobs in the central parts of the city (Walker, 2018). Current transport policy strategies thus feature a strong focus on the extension of night-time rail services and contain no evidence indicating that different or additional policy options – for example investment in night-time buses – had been considered. The publicly available 'evidence base' document (Volterra Partners, 2014) supporting night-time transport planning in London (referred to in the two key policy documents) only presents analysis on the Night Tube. Albeit blatantly limited by all conventional standards of rigorous, evidence-based policy development, this is unsurprising, as the Night Tube was announced already in 2014 before the development of the strategies analysed – demonstrating how non-linearity and path-dependency feature strongly in the policy process, as is established in critical literature on policy-making.

There are two separate pieces of analysis presented in the report by Volterra Partners (2014). The first is TfL's internal business case analysis for the Night Tube, with the second being Volterra's analysis of wider economic benefits. TfL's analysis combines a trip generation forecast generated through transport modelling, as well as an estimation of journey time savings, and the costing of these: "*TfL's modelling suggests that nearly 180,000 trips will be made on the Night Tube between 00:30 and 06:00… Those who switch from night bus to Night Tube are estimated to get an average time saving of 20 minutes*" (TfL, 2015a, p.5), with the total value of these time savings being calculated as £481 million over 30 years. This use of 'Value of Travel Time' calculation founded on neoclassical transport economics to estimate the economic value of savings (Mackie et al. 2001) is reflective of the UK Department for Transport nation-wide WebTAG (Transport Assessment Guidance). The

442 business case analysis estimates an average time saving of 20 minutes based on 13 origin-
443 destination pairs and the assumption that transport users will and can switch from using night
444 buses to the Night Tube along these routes. This approach falls in line with the standard way
445 of presenting benefits for the 'general population' of transport users (Hine and Mitchell,
446 2001) and fails to acknowledge how socio-economically and spatio-temporally differentiated
447 needs shape travel behaviours and preferences. The report mentions night-time workers in
448 stating that time saving benefits may be especially important to them, yet, in contrast to the
449 sophisticated modelling discussed above, specific analysis of benefits to workers is limited to
450 two anecdotal quotes from employees in the food industry. These "improved commuter
451 journeys for many people who work during the night-time in central London but live further
452 out" are qualified as a wider, 'unquantifiable' impact (Volterra Partners, 2014, p.3) clearly
453 not warranting deeper analysis.
454
455 Despite stating provision for night-time workers as an element of London's NTE, neither of
456 the TfL and GLA policy strategies nor the Volterra report present evidence of accessibility
457 analysis that would reflect this concern. If policy-makers were seeking to operationalise this
458 normative commitment, the most obvious planning exercise to undertake would be to carry
459 out a spatial analysis of the location of current night-time employment and the residential
460 locations of night-shift workers, and analyse transport connectivity, quality of service and/or
461 journey times between these points. TfL routinely undertakes such exercises, termed
462 'catchment analysis', to understand general employment accessibility for the London region
463 (TfL, 2015) and thus there is no reason why this has not been employed to the case of night-
464 time transport, too. Instead, the policy analysis uses transport economics to justify the
465 planned and now realised investment into weekend Night Tube services.
466
467 These policy interventions and analytical tools that form part of London's NTE transport
468 planning reveal the narrow way in which economic and social needs in relation to transport
469 are understood by policy actors. As discussed above, so far, the NTE policy agenda in
470 London has focused only on the extension of rapid rail transit services to operate on a 24-
471 hour basis over the weekends (Greater London Authority, 2017a). Indeed, the Night Tube
472 may appear an 'easy sell' – who could be against such a socially progressive transport
473 service, fitting for a global city? We demonstrate, in this paper, that some analysis of publicly
474 available data is all it takes to reveal the equity issues posed by the current policy approach
475 and exclusive focus on the Night Tube.

Considering the needs of low-paid night-time workers, it is crucial to consider that night bus services are heavily used by this group for commuting (TfL 2017b). According to the latest TfL Bus User Survey, 51% of night bus passengers are travelling to and from work, and 57% of night bus passengers have an annual household income of less than £20,000 (TfL, 2014). According to the latest 2012/13 figures, the mean annual household income in London is £51,770 (Greater London Authority, 2015), thus shedding light on the extent to which night bus riders are socio-economically disadvantaged. One reason for low-paid workers relying on night bus services may hence be public transport affordability: TfL rail fares are considerably more expensive than bus fares. The difference between the cost of an annual Bus and Tram Pass (£848) and an annual Zone 1-4 Travel Card (£1892) is equivalent to 5.2% of an annual household income of £20,000 (10.4% if assuming there are two commuters in the household). To reduce redundancy of transport provision along new Night Tube routes (and likely achieve cost savings to fund the operational costs of new services) London night buses are to be 'rationalised' with changes to routes and frequencies of many lines. The report on the public consultation regarding these changes reveals a significant number of concerns raised by respondents regarding 'night work' and the affordability of switching from night buses to the Night Tube (TfL, 2016). The equity impacts of the current policy approach to investing in night-time rail, as opposed to night bus, provision are thus questionable, speaking to a long-standing academic and policy debate regarding bus versus rail investment as an issue of spatial justice in cities (Soja, 2010). Furthermore, *weekend* rail services are unlikely to significantly address the needs of low-paid night-time workers outside the nightlife or entertainment industries: night-time work in lower-paid sectors such as transport and logistics, health and social care and hospitality (including cleaning) is of course distributed across the week, rather than concentrated to the weekend. The anecdotal evidence cited by the Volterra report regarding benefits of the Night Tube for night-time workers thus fails to acknowledge this crucial limitation: the fact that benefits of the Night Tube can only accrue to individuals working weekend shifts.

These two basic observations demonstrate the extent to which it is questionable that the Night Tube would cater to low-paid night-time workers in London. The current policy discourse and investment approach illustrates the limited socio-spatial engagement of policy-makers with the differentiation of travel needs at night, as a significant proportion of London's night time workers are in fact working in health and social care, transport and retail, all of whom

currently face limited travel options and long journey times for commuting. The map below displays the current night bus and night tube network across Greater London (current at August 2018), including Night Tube and night bus routes, alongside new night bus routes operating on weekends to supplement the Night Tube. The map illustrates the incomplete coverage of the night-time transport network, and dominance of radial routes between the centre and periphery.

Figure 2 – Night time transport provision (Source: Authors. Tube and bus routes mapped from Transport for London data, retrieved August 25, 2018 from https://tfl.gov.uk/maps_/bus-spider-maps)

For night-time workers living in areas of Outer London with poor public transport accessibility at night, equitable transport provision is not only a question of connectivity, but also service quality and the journey experience. Night-time workers commuting to and from such areas via night bus during weekdays may suffer from having to transfer between buses or between bus and rail, which has been proven by existing studies of public transport use in London and the UK to amount to a significant transfer 'penalty' that often increases the monetary cost, journey time and comfort of travel (Guo et al. 2011, Paulley et al. 2006).

4.3 Policy narrative: entertainment, nightlife and creativity are the cornerstone of London's NTE

The discourse put forward in the London 24-hour Vision "From good night to great night: a vision for London as a 24-hour city" (Greater London Authority, 2017a) emphasises the importance of the creative and entertainment sectors in London's NTE. London's status as a global city is paramount, and developing the NTE to support higher quality culture and entertainment is viewed as a vehicle to maintain and enhance this status. The narrative hints at a young, creative and vibrant night-life for Londoners and visitors. It has to be noted that the vision recognizes the diversity of what constitutes the NTE in some instances, highlighting that "*we can also do more for our vital nurses, police, freight and transport workers whose shifts go through the night*" (Greater London Authority, 2017a, p.6). Yet, the concrete policy measures proposed as part of this strategy predominately relate to nightlife, pubs and clubs and connecting consumers to nightlife centres during the weekend. As shown in the previous sections, night-time transport planning has been problematized around its potential for generating increased economic activity; and the tools and policy instruments used to achieve this objective have been relatively insensitive to issues of equity and accessibility for night time workers. Similarly, the narrative adopted by the 24-hour vision stresses the importance of economic activities and businesses that support London's nightlife. The strategy also highlights need to create safer, more accessible spaces for people to keep consuming at night.

This imbalance is further reflected in the Night Time Commission, which does not include representatives from sectors such as healthcare: "*The vision will be realized by Night Czar Amy Lamé alongside the new Night Time Commission chaired by Philip Kolvin QC,*[1] *which will include planners, licensing experts, venue owners, artists, the police, media entrepreneurs as well as leaders of major cultural organizations*" (Greater London Authority, 2017a). Paying attention to the type of actors involved in strategy setting and policy discussions is essential to understand how issues are problematized, how specific

[1] Who, at the time of writing, has been replaced by the CEO of the Association of Licensed Multiple Retailers as the new chair of the Night Time Commission.

policy instruments are chosen, and how common narratives are defined. The absence of organizations representing key night-times workers is surprising, as data from the report produced by Ernst & Young (2016) show that across all sectors featuring a higher likelihood of night-time work, there are many more employees in transport and storage, health and social, and administrative sectors. Arts, entertainment and recreation are significant, but by no means the dominant sectors of London's NTE. As shown in Figure 2 below, arts and entertainment only account for 6.4% of the employment in the NTE, and hotels, restaurants and bars for 13.4%.

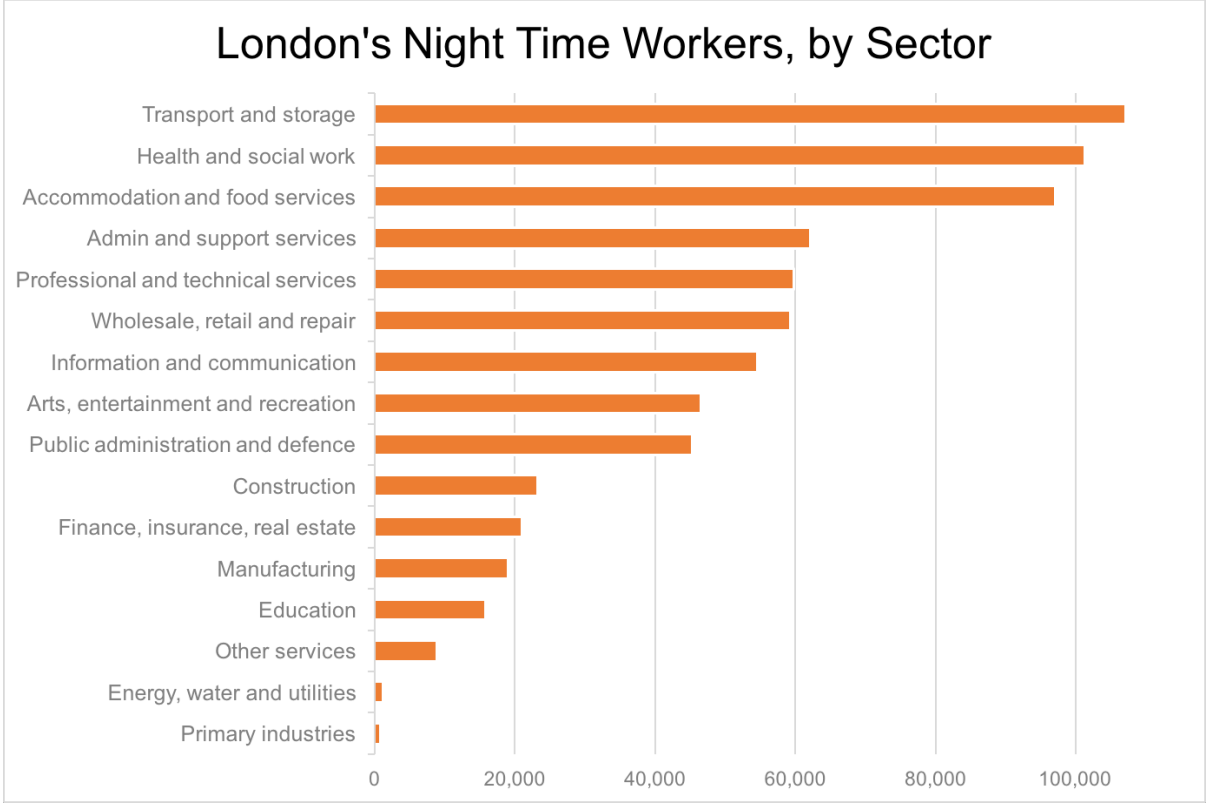

Figure 3 - London's night time workers, by sector (Ernst & Young, 2016)

With respect to neglected sectors such as health and social care, this asymmetry between the real nature of the NTE and the sectors and workers afforded the attention of policy-makers is stark. In responding to a call for evidence to inform this research, the Royal College of Nursing (RCN), a membership organization representing nurses and healthcare professionals across the UK, stated:

"The NTE is simultaneously reliant on the labour of health care workers, but as of yet, does not serve their needs adequately. Health care workers finishing shifts between 12am and 2am are left with a slimmer service, and for those requiring public transport into the outskirts of the city, it means extended waits, more changes and longer journeys... Higher housing costs and expensive travel... mean that more and more of the capital's health care professionals are being forced to spend increasing proportions of their wage on travel." (RCN, 2017)

Indeed, a 2015 survey of nursing staff in London showed that while rail services are heavily used by staff for the commute to work, 49% of staff also use bus services to get to work; furthermore, 7% of the average London nurse's pay is spent on transport (RCN, 2016). Yet, the voices of such sectors have, to date, not been included or discussed as part of London's formal governance structure for NTE policy-making.

5. Discussion and Conclusions

The London case we have discussed highlights that emerging policy paradigms, in this case the NTE, pose new challenges to transport planning, especially when it comes to issues of equity. Time-space geography has made significant progress in developing a more nuanced understanding of mobilities and travel demands across time and space, illustrating how different social and temporal needs intersect. In this paper, we consider the socio-economic and spatio-temporal dimensions of equitable transport provision emerging from analysis of London's policy interest in the night, and the accompanying investment set out in policy strategies. As a growing number of cities around the world are attempting to leverage the opportunities of "24-hour city" planning (van Liempt et al., 2015), the London example illustrates the blind spots of current transport planning strategies and their limited capacity to support equity across socio-economic and spatio-temporal dimensions. By relying on approaches to transport planning drawing on neoclassical economics and the minimisation of Generalised Travel Cost, and identifying transport needs based on the location of nightlife hubs, the current paradigm neglects the perspectives and needs of those workers and sectors upon which the NTE depends. Mirroring the issues of implementing pedestrian zones in Brussels, London's Night Tube 'brackets questions of uneven development, gentrification, class politics and urban democracy' (Kębłowski et al., 2016, p. 4). Scrutinising the work done by policy frames reveals the apparent blindness of policy-making to the existing context of vast socio-spatial and temporal inequities in London's transport provision, alongside critical

608 distributional impacts of the Night Tube, resulted in transport investments that unwittingly
609 risk exacerbating these inequities. This policy approach thus continues to underprovide for
610 night-time workers, while seeking to grow the night time economy. London 24-hour Vision
611 makes discursive commitments to addressing the needs of night-time workers, but the reality
612 of planning for nocturnal transport highlights a clear emphasis on increasing the connectivity
613 of night-life consumption hotspots (as highlighted in a recent report by the London
614 Assembly, 2018). Temporal equity is a pivotal consideration for labour market accessibility,
615 given that many transport systems provide the highest service quality and frequency for peak-
616 hour travel, and tend to equate a smaller level of travel demand with lower levels of service
617 provision. In light of the low-wage sectors in which many night workers are employed,
618 workers' ability to shift from night bus services to the Night Tube is uncertain and thus
619 estimated benefits may obscure distributional impacts whereby the Night Tube
620 disproportionately benefits night-time consumers and weekend night-time workers whose
621 workplace is located in nightlife hotspots and who can (in some cases) afford travelling by
622 tube. Furthermore, the London case analysed effectively illustrates how transport choices are
623 heavily shaped by the type of institutions involved in defining transport issues, the tools used
624 to assess and define priorities for transport planning, and global city narratives around the
625 creative 24-hour city. This paper hopes to offer a valuable contribution to a re-politicised
626 approach to transport studies by showing how deconstructing discursive framings of the NTE
627 and associated transport interventions can help revive discussions on equity and spatial
628 justice. In particular, it has shown that 'best practices' and 'global city visions' put forward
629 by local political coalitions alongside with one-sided transport options assessments contribute
630 to obscuring the needs of less organised and less resourceful groups, in this case low-paid
631 night-time workers. Reflecting simultaneously on socio-economic, spatial and temporal
632 aspects of transport equity, in terms of problem definition, creation and sorting of specific
633 spatiotemporal categories, and narratives, illustrates both the politicisation of transport policy
634 and the limited attention given to transport equity. Research for more inclusive transport
635 planning strategies should therefore attend to the mobility needs of those who actively
636 contribute to urban night-time economies, through quantitative, spatial and qualitative
637 analysis revealing how differentiated access to transport is shaped by spatio-temporal and
638 economic constraints.
639

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