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Governing urban accessibility: moving beyond transport and mobility

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Abstract

Access to people, goods, ideas and services is the basis of economic development in cities. The better this access, the greater the economic benefits through economies of scale, agglomeration effects and networking advantages. The way in which cities facilitate accessibility also impacts directly on other key aspects of human development, social inclusion and well-being. Accessibility is created through a complex interplay of urban form and transport systems. Thus, governing urban accessibility requires moving beyond conventional urban transport considerations linked to mobility and movement. Such a re-framing implies a far greater recognition of urban form characteristics like land use, distribution of densities and urban design, in addition to transport characteristics like infrastructures, service levels and travel speeds. A new interface between these characteristics has emerged as a result of shared mobility systems, putting additional pressure on city governments to act as system integrators. Based on a literature review, empirical insights from a global survey and the case-study cities of London, NYC and Berlin, this paper explores the institutional capacities of shifting from governing urban transport to urban accessibility. The evidence shows that there are entrenched misalignments which may impact negatively on the capacity to pair planning and policies essential for delivering better accessibility. Furthermore, it is clear that 'hierarchies' and 'networks' are not mutually exclusive when it comes to integrated governance of accessibility. The findings also suggest that cities may be better equipped to integrate shared mobility and consider mobility as a service than to pursue more wide-ranging metropolitan accessibility policies.

Keywords: cities; institutional arrangements; mobility; transport policy; urban governance

1 Introduction

This paper investigates the urban governance implications of shifting disparate transport policy and spatial planning frameworks towards a joint focus on urban accessibility. This cross-sectoral focus directly targets the production of possibly the most fundamental urban quality: efficient access to people, goods, ideas and services. Accessibility in cities is created through a complex interplay of urban form and transport systems, i.e. the location and distribution of functions and how these are connected by transport. Thus, an accessibility paradigm implies going beyond conventional transport planning with its almost exclusive focus on how to enhance movement between given locations as well as beyond traditional land use planning which often has little understanding of transport systems.

In academic theory, accessibility has been of interest for some time and relevant work began maturing from the 1970s onwards alongside an increasing awareness of the shortcomings of modernist city planning. During the 1990s it became a more fully developed concept in transport studies (Topp 1994, Houghton 1995, Gertz 1997, Cervero 2001, Simpson 2004, Knoflacher et al. 2008). Over the last decades, strategic spatial planning began embracing ideas of more efficient urban access based on a better distribution of urban functions, higher densities and mixed use. Today, these characteristics make up the core of established planning ideals such as the compact city, smart growth and transit-oriented development. Similarly, transport planning has departed from single-mode planning and embraced a multi-modal mobility approach and is increasingly confronted with demands for engaging with the far more ambitious accessibility agenda.

Still, compared to the overall ambition of an accessibility approach to planning and policy making, actual transport and spatial planning practice in and for cities mostly remains of a traditional and disjointed nature. Unsurprisingly, the focus of attention has shifted from theory to praxis and city access has received considerable interest across a range of diverse initiatives. For example, alongside compact and dense urban development, a focus on accessibility features as part of the United Nation's New Urban Agenda (UN 2016) and has been embraced by the Global Commission on the Economy and Climate (Rode et al. 2014a). It is the focus of The Brookings Institution "Moving to Access" Initiative (Gutman and Tomer 2016) and part of the 2017 focus of the International Transport Forum at the OECD (ITF).

As part of this stronger focus on implementing accessibility as a policy agenda, urban governance and the 'rules of the game' of urban decision making is of particular interest (Gutman and Tomer 2016, Rode et al. 2016, Rode 2018). On the one hand, this is due to the recognition that governance arrangements will ultimately be instrumental in facilitating a more joined-up and integrated approach to transport and spatial planning. In fact, most current arrangements are instead acting as considerable barriers to horizontal and vertical planning and policy integration. On the other hand, urban governance is in any event confronted with two disruptive factors challenging 'business-as-usual'

approaches. First, climate change and the environmental agenda demand accelerated action which current arrangements seem unable to deliver. Second, technological change – above all, in the transport and communications sector – increasingly demands new institutional frameworks that can cope with an emergent sharing economy, digitalisation and automation in cities.

But rather than speculating on potential future institutional change, this paper will serve as a reality check of the current urban governance arrangements and their capacities to address the accessibility paradigm. The paper will address this objective based on empirical insights at three levels. First, it will make use of global urban governance survey, undertaken by LSE Cities in partnership with UN-Habitat and United Cities and Local Governments (UCLG) with self-reported insights from 78 city governments to analyse the vertical alignment of key policy pairs across governance levels. Second, it will present strategic spatial planning and its integration with transport policy in London and Berlin, two cities which over the last decades have embraced more compact, accessibility-oriented urban growth. And third, it will contrast as part of strategic transport policy and to what extent governance networks in London and New York enable to connect transport perspectives with spatial planning.

This paper is divided into four main sections. It first presents a literature review of the shift towards accessibility planning and its implications for urban governance. It then introduces the methodology based on a comparative case study approach. The main three sections that follow are dedicated to discussing the empirical findings.

2 Cities as transport solutions: Access beyond movement

Over the last decades, transport planning in many cities has shifted from a narrower focus of planning for individual transport modes to mobility planning which is considering multiple modes of travel. However, a further shift towards accessibility planning which considers access beyond movement through land use decisions, has, by and large, remained an ideal which urban practitioners struggle to embrace. In many ways, shifts in theory and practice reflect perceived and real failures of modernist transport planning, which has, for example, informed the car-oriented designs of suburbia, the roll-out of urban motorways and conversion of vast amounts of public space to parking.

Above all, accessibility planning is a critique of functionally segregated land use and its simplistic view of the relationship between urban life and city design (Peters 2017). With that critique comes a new ambition for better addressing the complexities, interrelationships and codependencies – the *urban nexus* – characteristic of city systems. Instead of planning the city through self-contained and segregated policy sectors, this ambition directly targets this urban nexus as part of the spatial governance of the city. As we will show, this becomes most evident in the context of the relationship between urban form and transport and how both elements need to be dealt with jointly to provide accessibility to people, goods and ideas in cities.

The accessibility paradigm

Contemporary transport planning theory provides a backdrop for an increasing interest in city access. No longer, it is argued, should transport be regarded as the simple facilitation of movement; instead, it should concern itself with the overarching objective of increasing accessibility (Topp 1994, Houghton 1995, Gertz 1997, Cervero 2001, Simpson 2004, Knoflacher et al. 2008, Sheller and Urry 2016). Since the early 1990s, calls for a 'new realism' (Goodwin et al. 1991, Owens 1995, Docherty and Shaw 2008) in transport planning have forcefully argued for the 'predict-and-provide' model of transport planning to be replaced by a greater focus on demand management and land-use planning. These acknowledge that the transport sector alone – the 'maker and breaker of cities' (Clark 1958 p237) – is not able to achieve accessibility objectives and has so far failed to address successfully not only wider negative externalities, such as high resource intensity, air pollution and carbon emissions, but also narrower transport concerns, in particular traffic congestion, road accidents, loss of productivity and transport inequalities (Hajer and Kesselring 1999, Vasconcellos 2001, World Bank 2002, Litman 2011).

Transport has the potential to increase accessibility between different activities and services such as housing, working, shopping, education and leisure opportunities. This logic has also been at the heart of modern transport planning, which aimed to 'integrate' metropolitan regions based on car-oriented infrastructure and urban form (Gandy 2003). It is the kind of traditional transport planning that is essentially driven by objectives of 'time-space compression' (Harvey 1990, Urry 2001) and which only looks narrowly at optimising the trip from activity A to activity B, usually by increasing travel speeds. Yet, this approach tends to miss the far greater opportunity for facilitating access to activities A and B: reducing the physical distance between the two, or even co-locating them in one place and thereby reducing the need to travel (Owens 1995, Banister 1997).

Furthermore, many transport solutions of the past have even severely compromised accessibility (Topp 1994, Gertz 1997, Hajer and Kesselring 1999) by facilitating the segregation of different land uses, increasing community severance and reducing the attractiveness of urban environments. By contrast, accessibility based on physical proximity implies a particular attention to planning, designing and managing the specific local condition at a human scale that often escaped the transport profession in the past (Baxter 2001).

It is further argued that successful co-location of different uses such as residential functions, community services, retail, health and educational facilities at the neighbourhood level relies on improved walkability and micro-accessibility rather than facilitating greater speeds for urban mobility. Also, it is suggested that a greater consideration of this 'last mile' of urban travel needs to be carefully balanced with the macro-accessibility required at the metropolitan scale. Following this perspective, future urban transport planning would therefore have to aim at '… connecting places

while at the same time creating locations' (Knoflacher et al. 2008 p347). Thus, accessibility-based transport planning and compact urban development is increasingly regarded as more successful in addressing traffic congestion and excessive travel costs, increasing energy and carbon efficiency as well as advancing the sociability function of cities (Rode et al. 2014a).

The new interest in accessibility in cities also rests on advances in the empirical analysis of the transport and land-use relationship (Newman and Kenworthy 1996, Handy et al. 2006, Cao et al. 2009, National Research Council 2009, Dimitriou and Gakenheimer 2011, Zhao 2011, Baum-Snow et al. 2012, Rode et al. 2017). The interdependence of fixed structures such as buildings, public space, streets and infrastructure as well as their uses and the possibilities for moving people, goods and information is often regarded as a determining factor in shaping the city (Knoflacher et al. 2008, Rydin 2011). It is also a relationship where cause and effect can be identified in both directions: urban form affects transport and transport has an impact on urban form.

Most recently, new digital technology and emerging patterns of shared mobility have shed further light into the transport urban form relationship. Rather than surveys, travel diaries, and traffic counts, trackable smart phones, GIS-enabled sensors and vehicles present researchers with detailed maps of actual behaviour patterns as it occurs (Kitchin 2014, Shin et al. 2015, Birenboim and Shoval 2016, Canzler and Knie 2016). Most of this confirms what was established through more resource intensive research earlier: walking, cycling and the use of public transport is strongly associated with denser, mixed-use urban environments while car use prevails in more sub- and ex-urban environments.

As new and often real-time data presents an ever more detailed mirror of how we are engaging with the built environment, the underlying technologies have begun to alter travel patterns in cities. Multi-modality where users combine two or more transport modes is conveniently assisted by mobile travel apps which have also revolutionised the use of car and bike sharing. As a result, a pronounced shift away from conventional car use and towards multi-modal, public, and shared mobility has been observed in many OECD country cities (Rode et al. 2015). Alongside the massification of smartphone connectivity, mobility services such as Bridj, Lyft and Uber, alongside car sharing by Zipcar, Car2Go and DriveNow, have become a clear alternative to conventional car ownership.

However, similar to public transport, car sharing relies on certain threshold densities allowing for walkable access to shared vehicles. In turn, the spatial implications, above all the distribution of parking slots, for station-sharing is of critical importance. A study of mobility attitudes towards shared mobility services in London and Berlin also showed a strong relationship with residential location of individuals with positive attitudes towards sharing significantly more likely in denser, more central urban areas (Rode et al. 2015).

Governance implications

Theories about urban governance range from the ones focused on the quality and effectiveness of institutions and the behaviours of public agents (governments, authorities, agencies, politicians, bureaucrats and civil servants) – the way power is exercised – to the ones that instead focus on the interactions between different agents (public, private or mixed) and how those interactions shape public policies – the rules and traditions that underpin policy-making (da Cruz and Marques 2017). In recent decades, and to a large extent due to new public management reforms and the hollowing out of the state through austerity policies, the concept of 'network governance' gained traction at the global scale (Rhodes 1997, Klijn 2016). Indeed, whilst pursuing their vision for the city, local governments are subject to the influence of other levels of government, the need to coordinate with neighbouring municipalities, lobbying pressures, and democratic concerns (Pollitt, Pierre 2011). So it makes sense to conceptualise these processes as a complex network of different actors interconnected in formal and informal ways. Still, Rode (2017) shows that the hierarchy-network duality is ineffective in accounting for institutional change in cities. Successful policy-making in the transport sector may require top-down hierarchical organization and new forms of metagovernance that ensure the buy-in of more loosely and self-organized networks of actors.

Governing accessibility including the new shared mobility opportunities relies on strategic planning capabilities, which in turn tend to be based on more coordinated and integrated policymaking. Concepts closely related to integration and prominently featured in the literature are 'policy coherence' or 'holistic' and joined-up policy, governance and government (OECD 1996, Wilkinson and Applebee 1999, UK Cabinet Office 2000, 6 et al. 2002), whereas fragmentation and inconsistency are commonly regarded as their opposite (Lawrence and Lorsch 1967, OECD 1996). With regard to the latter, some scholars stress that fragmentation should not be equated with specialisation (6 et al. 2002) and that high levels of integration can indeed be achieved in contexts that are highly specialised and differentiated (Lawrence and Lorsch 1967).

The new emphasis on integration relates above all to the challenge of managing complex, interrelated issues and the benefits of increased efficiency and effectiveness of policies and governance regimes. A central case for integrated planning and holistic governance emerges from recent demands to orientate policy around problems and challenges rather than policy sectors (6 et al. 2002) – the provision of access to the city being a prime example. It has also been noted that most policy outcomes that matter to citizens are produced by multiple departments and professions (Smith 1996). As a result, governance discourses have, for example, turned away from new public management and the deconstruction of public agencies towards the reintegration agenda of digital-era governance (Dunleavy et al. 2006).

While sustainability is often identified as a central reference for policy integration, territorial development has been singled out as strategically positioned for its translation into specific investment programmes and regulatory practices (Albrechts et al. 2003). The latter directly relates to

city-level governance and the opportunities that exist for metropolitan and city governments to address the urban nexus and to steer spatial development. Urban governance tends to be seen as a mode of organising policy around place-based intervention, which requires horizontal integration instead of functionally organised sectors, and silos that prevail at higher levels of governance (Stoker 2005).

Furthermore, the recognition of various integrative skills and capacities of local government (Richards 1999) has itself motivated the desire to devolve powers from national to metropolitan and city governments. Spatial planning in particular – a policy field that is usually led by city governments (Rode et al. 2014b) – is driven by a desire for greater coordination, and contemporary planning has been characterised as ultimately being 'about integration and joined-up thinking in the development of a vision for an area' (Rydin 2011, p19). The recent UN Habitat (2009) report on planning sustainable cities even points to the potential 'to use spatial planning to integrate public-sector functions' (pvi).

Across various spatial policy sectors, the particular dynamics between land use and transport position the pair at the forefront of the policy integration agenda. Within urban transport, related challenges have been specifically linked to a 'bad distribution of the responsibilities between the many parties involved' (Dijst et al. 2002 p3). Hence, a range of policy statements has highlighted the role of integration and cooperation across different departments, service providers and different levels of government in helping to 'green' the sector (DETR 2000, ECMT 2002, US EPA 2010).

Cost-effectiveness and infrastructure funding opportunities also support a more integrated agenda (Lautso et al. 2004, Laconte 2005, Litman 2011), and combining the development of land and transport infrastructure further can lead to unique financing opportunities (Cervero and Murakami 2009). Finally, important arguments integrated planning and policy making within the urban transport ecosystem are put forward by those concerned with shared mobility and mobility as a service (Giesecke et al. 2016, Salice and Pais 2017).

By investigating contemporary integration and joined-up thinking for urban planning, city design and transport policies in the three case study cities of Berlin, London and New York, we aim to offer insights into a possible new approach to planning and policy integration. In particular, our research intends to inquire to what degree institutional arrangements may or may not be able to cope with more integrated accessibility governance.

3 Research framework and methodology

This paper examines current urban governance arrangements and their capacities to address the accessibility paradigm. The empirical research presented below includes three different components, each with its own data collection and analysis.

The first component is a global survey of city governments which was undertaken from July 2014 to September 2016 by LSE Cities in partnership with UN-Habitat and United Cities and Local Governments (UCLG). The sample analysed in this paper comes from a set of 78 out of 127 city governments that took part in the survey in the run-up to the UCLG World Summit and Habitat III (LSE Cities et al. 2016). To provide a more representative perspective on urban governance across different nation states, no more than two cities from the same country were included in the analysis. The sample includes data from all continents and 53 countries, with stronger representation of cities from the Americas (26%) and Europe (40%). It considered a range of governance issues, including political power, budget and financing, multi-level governance, participation and accountability, strategic planning and institutional change. For this paper, two questions are particularly relevant: the indication of the level of influence different tiers of government have over different aspects of (1) planning and (2) transport policy.

In these two questions, representatives from city governments were asked to rate the level of influence that different tiers of government have over decision making in spatial planning and in the transport sector in their cities. In their responses, participants had to use the following scale: '0 – no influence'; '1 – limited influence', '2 – moderate influence', and '3 – significant influence'. The different tiers were labelled as 'below city level (e.g. borough)', 'city', 'metropolitan area', 'state/province/region', 'central/national/federal', and 'supranational'. Both questions listed relevant components, aspects or subsectors. For example, 'strategic planning', 'land use planning' and 'design standards/building codes' for spatial planning and 'urban design/walking', 'traffic management' and 'highway infrastructure' for the transport sector (see Appendix for other categories).

Given our objective of gauging the vertical alignment or integration of several policy subsectors – that is, whether the same tier of government as similar levels of influence over different components, aspects or subsectors of spatial planning and transport – we computed the 'distances' (or the differences) between the levels of influence of the various government tiers over different policy pairs. In other words, for each government tier, we calculated the difference in the influence score of all possible pairs of policy subsectors (e.g. 'strategic planning' and 'land use planning', 'strategic planning' and 'traffic management', and so on, for all the feasible combinations). To obtain a 'total distance' or 'total misalignment' score for each policy pair, we added the average distances in each government tier. Mathematically, the average total distance scores were obtained through the sum of the average of the differences between subsectors (at the same governance level), which were calculated for each of the 78 cities.

The second and third components are based on comparative, multiple case study method (Agranoff and Radin 1991, Yin 2013) and looks at three case study cities and their regions, London, Berlin and New York for which data on actual governance practices was also available through prior research by the authors (LSE Cities 2017, Rode 2018) .

For the second component focussing on strategic spatial planning, the chosen cases of urban governance and government come from the two cities Berlin and London and their metropolitan regions. These cities were selected as they combine 'critical cases' (i.e. cities that are of particular relevance for a better understanding of integrated urban practice) and 'extreme cases' (i.e. the largest conurbations within broader geographic regions characterised by significant urban change and a certain degree of urban complexity). In addition the cases are bounded by a temporal focus covering the two decades from the early 1990s onwards, following the introduction of a global commitment to sustainable development. Embedded in these cases is the unit of analysis which is defined as 'integration mechanisms' facilitating the integration of urban planning and transport policy. The analysed groups of integration mechanisms are governance structures, planning processes, integration instruments and enabling conditions. The effectiveness of these integration mechanisms is considered in relation to planning and policy capacity (as judged by interviewees and other empirical evidence from the relevant literature) rather than with regards to policy outcomes.

Three types of data sources were used for this component: newly generated data was based on expert interviews, and existing data consisted of documentary information and archival records. Understanding how urban planning and transport policies are related to each other requires access to tacit knowledge not readily available in existing documents and archives. Thus, this research component included over 20 in-depth interviews with key stakeholders in each city. Most interviews were conducted in batches during two main phases, a first scoping phase in 2007 and an in-depth follow-up phase in 2012 and 2013. Given the role of leadership in integrated governance, a considerable number of political and administrative leaders were included. Interviewees included the former Mayor of London Ken Livingstone, former Minister for London Nick Raynsford and former Berlin Senators for Urban Development Peter Strieder and Ingeborg Junge-Reyer. Interviewed senior executives and civil servants were London's Transport Commissioner Peter Hendy, State Secretary Engelbert Lütke Daldrup and several borough heads (borough mayor/head of urban development) in both cities. Their views and insights were complemented by a range of other experts, civil servants, policymakers and private/third sector representatives.

The third research component focusses more narrowly on the governance of strategic transport. For this part, data from London and New York was considered (the related field work was conducted for the New Urban Governance project, LSE Cities, 2017). This choice also stems from the fact that given the considerable similarities of London's and New York's global economic status (Sassen 1991), there has been a sustained and advanced interest in comparative perspectives of urban transport governance across the two cities (Frug 2010). This data was collected via structured interviews with key individuals from different types of organisations/movements relevant to the respective governance networks. To identify who the key actors are and what is the network boundary we employed a snowball sampling approach. A reliance on empirically observed connections rather than

formal or theoretical assumptions or expectations about who governors are and how they work is central to this data collection process. This approach does not differentiate between informal and formal ties between actors. Rather, the interest is on 'real' ties, of different types, representing different exchanges (e.g. authority, resources, information, advice, reputation, etc.).

The initial group of respondents, singled out through desk research, nominated other individuals (and organisations and looser groups of individuals) in their replies to the questions of the interview script. There was an attempt select a heterogeneous group of respondents to use different 'entry points' into the networks (given the nature of this method, anonymity was guaranteed to all respondents in this research component). We conducted a total of 55 interviews in London and 40 for the case of NYC. The underlying urban governance patterns were formalised by mapping the ways actors relate to each other (the audio records of the interviews were transcribed and the transcripts were then used to produce the network data). A case-by-case matrix was produced for each question of the script. In other words, for each question, we produced a table that identifies which names (of individuals, organisations and other social groups) were mentioned in the responses to that question, and by whom.

After coding the narrative answers to the relevant questions the size of the transport governance networks of both cities were as follows: London included 424 unique nodes whereas in the case of NYC the total size was 321 (this includes all types of actors, that is, individuals, organisations and looser groups of individuals such as 'tube users' or 'cycling movement'). In terms of individuals, there are 265 people with particular stakes or capacity to influence transport strategies in London (the 'magnitude' of this influence, however, varies immensely among these individuals). In NYC this number is even lower, only 217 individuals were named in the course of the interviews. Looking instead at organisational data (which is more relevant for our current purposes), there are 190 entities in London and 163 in NYC that are particularly relevant for the governance of this policy sector.

4 The vertical alignment of key policy pairs across governance levels

The analysis of the vertical distribution of decision making power linked to different policy pairs presents a considerable range of the level of alignment/misalignment for the various planning and transport policy pairings. Our underlying interest here in what allows for effective policy making and coherence is less the absolute 'level of governance controls for different policy sector?' (though this is an important issue on its own right) but 'what policy sectors are governed at the same level?'. Whether it is the city, metropolitan area or central government that controls a particular policy sector has clear implications on issues of accountability and territorial equity. On top, if certain policy sectors are controlled by different tiers of government, this has implications on policy integration and on the deployment of an urban accessibility paradigm. The assumption here is that the greater the difference in the vertical distribution of policy remits, the greater the coordination effort. Table 1

presents the top (most misaligned) and bottom (most aligned) 10 policy pairs in terms of 'total distance' or 'total misalignment' score. The scores for all analysed policy pairs are introduced in the Appendix 1. It should be stressed that these scores correspond to a 'global average', not a particular local, regional or national setting. According to the survey data and these distance scores, there are favorable and unfavorable conditions for improved accessibility in cities.

Table 1. Top (least aligned) 10 and bottom 10 (more aligned) policy pairs in terms of vertical alignment across governance levels.

Pair	**Total distance**	**Ranking**
Least vertically aligned		
Suburban rail infrastructure - Strategic planning	9.13	1
Metro infrastructure - Strategic planning	7.81	2
Tram operations - Strategic planning	7.78	3
Metro infrastructure - Land use planning	7.70	4
Highway infrastructure - Strategic planning	7.31	5
Highway infrastructure - Land use planning	7.20	6
Suburban rail infrastructure - Transport & major infrastructure planning	7.09	7
Local roads operations - Transport & major infrastructure planning	7.04	8
Suburban rail infrastructure - Land use planning	7.04	9
Tram infrastructure - Strategic planning	7.03	10
More vertically aligned	*(...)*	*(...)*
Highway infrastructure - Metro infrastructure	3.38	162
Bus operations - Main streets operations	3.37	163
Cycling - Main streets operations	3.24	164
Taxi - Bus operations	3.04	165
Tram infrastructure - Metro infrastructure	2.94	166
Taxi - Main streets operations	2.88	167
Tram operations - Tram infrastructure	2.56	168
Local roads operations - Main streets operations	2.54	169
Density regulation - Design standards & building codes	2.47	170
Main streets operations - Traffic management	1.83	171

Regarding the 'capacity for metropolitan accessibility policy', the results are mostly discouraging. There is a large disconnect between capital intensive transport infrastructure (in particular, rail-based) and high level urban planning. Strategic planning (and land use planning) is consistently part of the most misaligned policy pairs, usually in tandem with suburban rail, but also metro, tram and highway infrastructure. This increases the coordination efforts and reduces the capacity of governments at any level to shift towards a great focus on urban accessibility as the underlying policy objective. Greater

potentials for transport and planning integration appear to be linked to density regulation, housing planning, land use planning and design standards & building codes seem similarly distributed across governance levels.

On the increasingly important 'capacity for integrating shared mobility and mobility as a service', the survey results indicate a greater potential policy capacity. For example, taxi services seem to be somewhat vertically aligned with various other modes of public transport, most notably bus (operations), paratransit and even tram (operations). Moreover, the same government tiers seem to hold similar levels of influence over taxis, main streets operations, local roads operations and urban design/walking. In a context where shared mobility and the platform economy are placing new pressures on transport systems, this suggests that existing governance structures may be able to deal with the tech-based disruptors in an integrated manner – both in terms of intermodality and the interface/relationship with public space. If governments (at any level) can do this successfully, new digital technologies may present a real opportunity rather than simply a threat to urban accessibility. However, although urban design and walking aligns well with other 'light' transport modes, influence over this sector is not shared with major transport infrastructure. Remarkably, it is also not aligned with design standards & building codes, housing planning and land use planning. Again, it seems it is necessary to build bridges between spatial planning policies and transport policies.

To provide a further illustration of the above, Figure 1 shows the partial scores for four selected policy pairs. Overall, the largest differences in magnitude of influence in decision making powers occurs at the city, national and sub-city levels (many contexts do not have formal metropolitan areas, administrative regions and/or are not subject to significant influence from supranational entities such as the European Union). Still, these differences are much smaller for (sub)sectors that mostly impact on shared mobility than for the ones that bear on the capacity to formulate and implement urban or metropolitan accessibility policies.

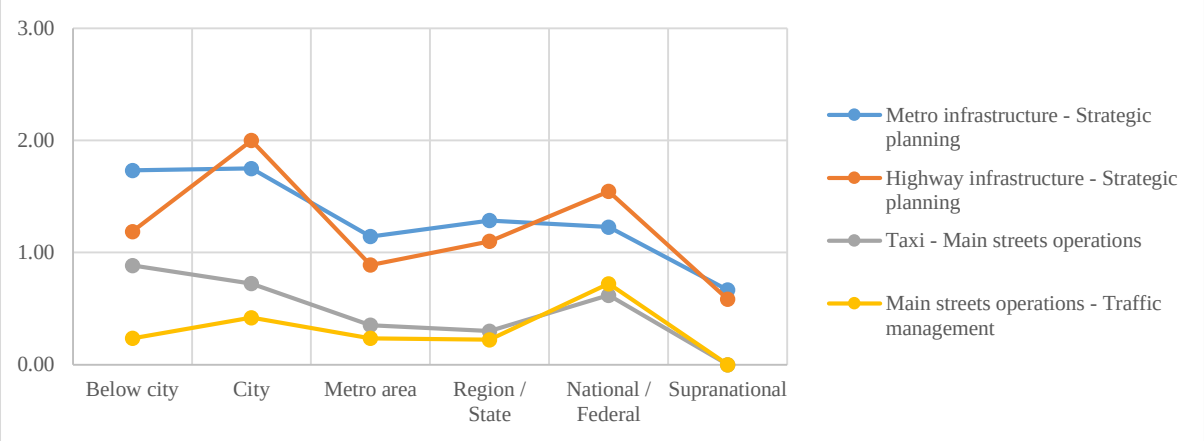

Figure 1: Average distances between policy sectors (at the same governance level)

Source: own representation based on data from LSE Cities et al. (2016) (2015) (2015) (2015) (2015) (2015)

The analysis presented in the next two sections focuses on specific case study cities and adds to the above perspective more details on how the integration of transport and urban planning can also be facilitated (or hindered) at the same governance levels.

5 Strategic spatial planning and its integration with transport policy in Berlin and London

As a result of their particular histories and the path dependent evolution of systems of government, Berlin and London today feature distinctively different arrangements. Above all, it is important to emphasise their distinct national systems: In the case of Germany, a federal state with strong, constitutional powers assigned to state and municipal level governments and in the case of the UK (England), a unitary state with a particularly strong centralisation at the national level. The main context of recent urban governance change in Berlin has been Germany's reunification while in London it is linked to the UK's devolution agenda.

Alongside these governance changes, Rode (2016) suggests that in both cities the integration of urban planning and transport strategies has markedly improved from the 1990s onwards. Based on this research, the sections below compare mechanisms that assisted the integration of urban planning and transport strategies in Berlin and London. This discussion is structured around an exploration of tendencies towards convergence and divergence of the two city's respective approaches to integration. Four groups of integration mechanisms were differentiated: first, those related to governance structures, second, those that focus primarily on processes of planning and policy making, third, a range of more specific integration instruments and fourth, underlying enabling conditions.

Governance structures

Convergence of integrating governance structures in the two cities is greatest for sectoral links at the citywide level. This was centrally informed by administrative reforms that made the overall governance of the two cities more similar (Röber et al. 2002): the decentralised model of London's governance became more centralised with a new strategic citywide administration while Berlin's powerful administrative centre become more strategic, reducing costs and devolve some planning powers to the boroughs. Today, both cities represent urban governance cases that combine and try to balance centralised and decentralised governance (see Figures 2 and 3). It should be noted, however, that coordination between land use and transport planning should not be regarded as a merely administrative-technical issue; it is clearly also a politically-contested one (e.g. the re-establishment of a London-wide government with vast planning powers had rippling effects in the city's politics that needed to be managed at all levels of governance (Travers 2015)).

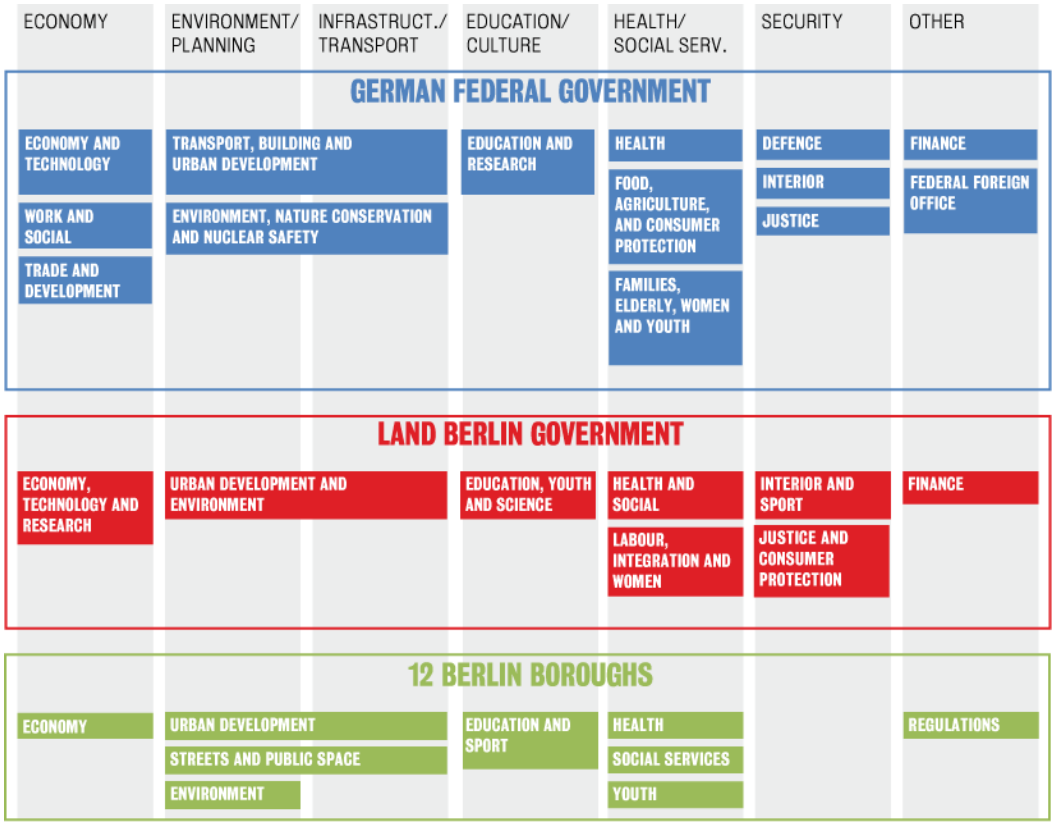

Figure 2: Structure of Berlin's government
Source: Rode (2018)

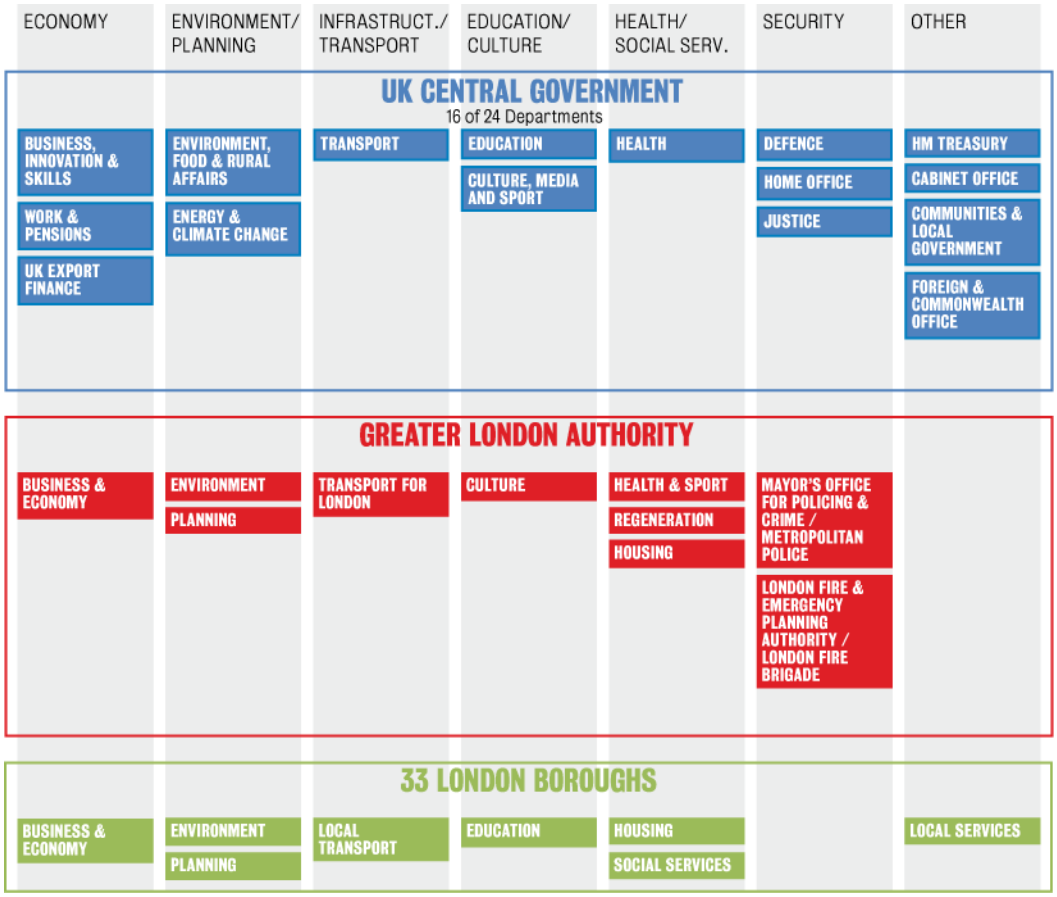

Figure 3: Structure of London's Government
Source: Rode et al. (2014b)

As part of these broader shifts, Berlin and London share three principal structural changes, which provide the backbone for planning and policy integration. First, spatial planning functions and transport policy making were concentrated within one larger organisational unit. And, most importantly, this unit is not competing for power, autonomy or legitimacy with another unit with a similar remit. In the case of Berlin, this is the Senate Department for Urban Development and the Environment (SenStadtUm), which was created in its current form in 1999 (see Figure 4). In London, the Greater London Authority (GLA), with Transport for London (TfL), was set up in 2000 and similarly bundled spatial development and transport.

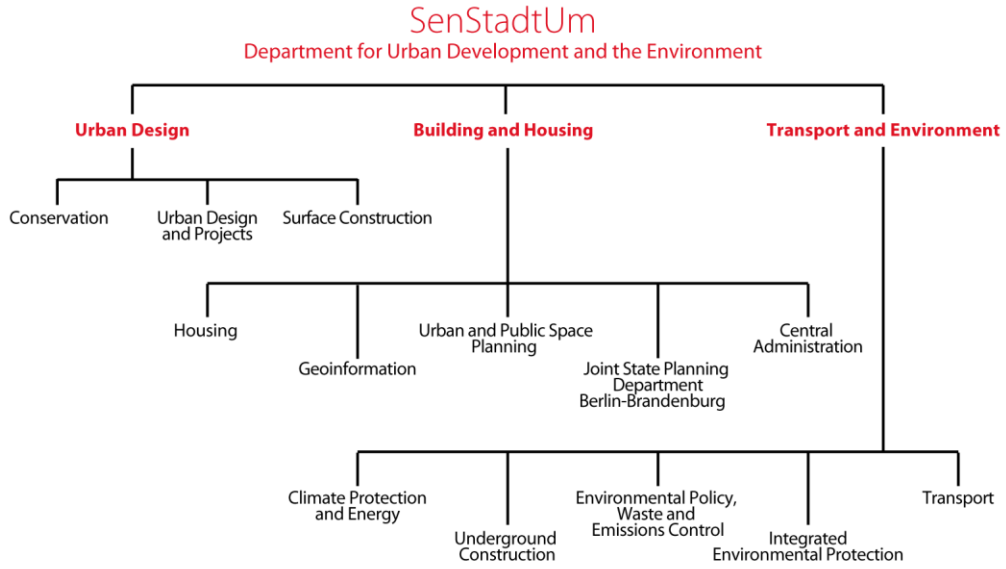

Figure 4: Organogram of SenStadtUm

Source: Rode (2018)

Second, hierarchical organisation was coupled to effective leadership as part of planning and policy coordination. In London, the directly elected Mayor who first came to power in 2000 can easily be singled out as the most important structural component for planning and policy integration. Berlin's constitutionally endorsed 'portfolio principle' establishes a hierarchical and monocentric organisation of senate departments and the strong line management within SenStadtUm continues to function as a critical integration mechanism. Top-level leadership is provided by the Senator for Urban Development, who has also been identified as key integrative force alongside his/her state secretaries and the department's directors.

Third, newer forms of network governance have emerged as additional factors, which have ultimately improved planning and policy integration. But rather than more inclusive notions of deliberative democracy and participation by the general public, the form of network governance mostly referred to consisted of professional public and private network actors which represent a form of 'networked

technocracy'. These advanced the quality of collaborating with each other and increasingly co-produced more integrated urban and transport development.

In Berlin, network integration was helped by a constitutional requirement for 'public authorities participation', the 'collegial principle' between senate departments and the recognition of 'organisations of public interest' as a critical network actor. More recently, these have been complemented by a range of boards and advisory committees, and a substantial increase in project-based work. London's network governance advanced particularly throughout the 1990s when a citywide government did not exist and, as a result, unusual coalitions had to be developed. The legacy of that period continues to facilitate a more fruitful exchange between different tiers of government, public, private and third-party actors.

A case of actually diverging trends relates to integrating the broader metropolitan region. In the absence of an administrative boundary that corresponds with the functional urban region, Berlin has implemented a joint-planning institution that deals effectively with the most relevant requirements for cross-boundary synchronisation and vertical planning integration. This has enabled Berlin to play a proactive role in planning its hinterland. By contrast, there is no dedicated institution responsible for planning in the London metropolitan region nor does the region have a metropolitan-wide planning process (John et al. 2005).

Nevertheless, there were instances where hierarchical structures were identified as integration barriers. Line management and reporting within SenStadtUm compromised project team work and matrix structure arrangements. Berlin's portfolio principle and related portfolio egoisms (Nissen 2002) can have fragmenting effects if different portfolios are not assigned to the same department. For example, considerable problems exist with regard to tax policy, which is often entirely decoupled from urban development. In London as well, governance structures based on narrow silos are regarded as a major impediment to integration as, for example, in the case of the hierarchical organisation of more narrowly defined central government departments with responsibilities for development in London.

All this points to a certain conundrum: integration inside the pyramid might be facilitated by hierarchies but they certainly act as barriers for issues located outside that pyramid. Having the top of the pyramid at the urban, citywide level appears essential for the case of integrating urban planning and transport strategies. But if the bundling of urban policy portfolios within one large hierarchical structure exceeds certain thresholds, i.e. if a pyramid is becoming too big, then the likelihood of stronger and more divisive sub-pyramids might increase and the situation is similar to a structure that is more departmentalised from the beginning.

Planning and policy making processes

Besides changes to governance structures, a wide range of planning processes and instruments were enhanced or set up following a similar approach to assist the integration of urban development and transport. Four high-level commonalities can be identified with regard to planning processes and instruments that broadly assisted integration.

First, there is the capacity of strategic plans – the London Plan and Berlin's FNP in combination with the urban development concept – to set a holistic agenda for urban development and to commit to a clear vision for the city. Second, there is a certain consistency of targeting mainly strategic issues at the level of citywide planning processes, while allowing for a degree of flexibility necessary to adjust to specific local conditions without compromising overall strategic objectives. Third, strategic planning in both cities is a continuous process, with ongoing engagement of a range of network governance actors and frequent updates of the most relevant planning frameworks. And forth, subsequent and parallel sectoral planning efforts, above all those related to transport, directly build on and inform strategic citywide planning.

The differences in integration efforts linked to planning processes are largely determined by the substantial differences between spatial planning in the two cities. The most relevant one is the degree to which strategic planning translates into legally binding building regulation. The Berlin Land Use Plan is a legally binding document for all subsequent plans, including building development plans (BPlans), which are in turn legally binding for individuals and therefore exercise a degree of planning power that is entirely unknown to the London Plan. The latter relies on sending strong strategic and political messages to boroughs, which themselves are responsible for local planning and have to separate plan and planning permission as stipulated by UK planning law.

The study detected such relationships for a range of critical sectoral boundaries, for which a negotiation style that "trades off control for agreement" (Rhodes 2000, p161) appears to be slowly emerging. The in-house collaboration within Berlin's SenStadtUm, particularly in those instances where working groups were set up, is one clear example. Similarly, collaboration in London between TfL, the GLA and London's boroughs represent reciprocal approaches. Many interviewees also emphasised the importance of personal relationships, by and large following Powell's observation that "the most useful information … is that which is obtained from someone whom you have dealt with in the past and found to be reliable" (Powell 1990 p304).

Several examples where integration in Berlin and London is achieved or at least supported by networks have also increased acceptability and thereby improved compliance among the most relevant actors – another key benefit usually highlighted as part of network governance (Rhodes 2000). A good example is the key stakeholders who are part of the preparation of Berlin's Land Use Plan (FNP) and the Urban Development Plan for Transport (StEP Verkehr). In London, an improved

relationship between the boroughs and the GLA over the first ten years of its existence had similar effects. In the case of the GLA, this is even more important as legal frameworks for implementing strategic planning are loose enough for local actors to have certain flexibility regarding compliance.

Instruments and enabling conditions

In addition, various concrete and similar technical integration instruments cutting across monitoring, modelling, forecasting and various assessment methods were advanced to assist planning and policy integration.

Finally, there are several enabling conditions for greater planning and policy integration, which play very different roles in London and Berlin. London has established various funding arrangements which have acted as an important integrative force and which play a less important role in Berlin. More notably in London as well were changes of skill sets, knowledge and capacity as a key factors enabling integration. The newly created GLA and TfL relied to a significant degree on hiring staff who would bring along considerable levels of individual and collective knowledge. And they were very successful in doing so as they could offer attractive working environments and job packages. Berlin, on the other hand, had far fewer changes to its public sector workforce and primarily continues to reduce the relatively large number of public sector employees.

Overall, diverging approaches to integration in Berlin and London relate to ongoing, stable differences rather than cases of increasing dissimilarity. Most of these differences can be linked to path dependencies created by the above mentioned broader institutional and cultural context within which the two cities operate.

Furthermore, London's government is based on a mayoral system with a strong, directly elected mayor and a relatively weak assembly, which mainly fulfils a scrutiny function. Berlin's government is cabinet-based with currently eight Senators and a Governing Mayor. The Mayor is elected by Berlin's powerful House of Representatives and since 2006 appoints all Senators, who before were also elected by the House of Representatives. In the case of London, top-level integration of planning and transport strategies is provided by the Mayor who is balancing transport and land use integration with other policy objectives, above all economic development. In Berlin, top-level integration is provided by the Senator for Urban Development, which allows for a 'purer' form of integrating the core agendas of spatial development and transport, which are both assigned to one department.

Finally, the study reveals an overall ongoing reliance on hierarchical integration but not at the expense of an increasing importance of network governance. In fact, hierarchies and network seem to be working alongside each other to assist with planning and policy integration in both cities.

Moving beyond the four analysed integration mechanisms, the final section below investigates how actual networks of communication, information exchange and decision making operate. Based on

empirical findings from New York and London, this analysis evolves around the dynamics of strategic transport policy and explores the connections between key actors and how these connect to spatial planning.

6 Strategic transport policy its integration with urban planning in New York and London

New York and London are a common pair for comparative urban research. They feature broadly similar populations, a comparable size and structure of the economy and share a range of socio-economic and environmental challenges. There underlying urban governance systems, however, is of considerable difference. New York, like Berlin, operates in a federal system and its metropolitan region is located at the intersection of three US States, New York, New Jersey and Connecticut. Among the strategic governance challenges, transport is often single out as a particular important while comparisons between the cities tend to highlight more favourable transport outcomes in London compared to New York.

In this section, we investigate the transport governance networks that inform decision making and implementation in London and New York. Based on expert interviews, Figures 5 and 6 present the connections between transport governance actors in the two cities. The size of the nodes (and their placement) are based on 'indegree' centrality. An indegree centrality score corresponds to the number of ties received by an actor (or node). In other words, it corresponds to the number of times an actor was referred to by other actors (whilst replying to the questions in the interview script).

Of particular relevance to this study is the role of and relationship between four different types of actors. First, pure transport policy and planning actors; second, actors primarily concerned with spatial planning and urban design; third, integrating actors which have actual political oversights and powers; and fourth, other actors which are part of this wider strategic transport policy arena. In terms of commonalities, both cities share the dominance of a range of central players in addition to a range of more numerous second, third and fourth tier actors. As a main differences between the two cities is the overall number of network actors, which appears to be higher in London than in New York. This may have been the result of conducting more interviews in London than in NYC. However, the potential impact on the actors' relative centrality is very limited as central actors would be expected to continue to proportionally attract more 'ties' if more interviews were carried out in NYC. Also, it should be noted that the same sampling approach was adopted in the two case-study cities.[1]

[1] The interviews were carried out in two phases. The second-phase interviews were identified on the basis of the answers gathered in the first phase (which included 33 interviews in London and 35 in NYC). The criteria for selecting participants for the second phase did not simply consisted of prioritising the most cited names, although this was the main concern/criterion. Indeed, to include some 'critical voices' and to make sure the core networks were comprehensive, the second phase of the snowball sampling process also targeted some seemingly 'side-

While both cities share a dominance of pure transport actors at the centre of their respective networks, their prominence in New York is significantly higher compared to London. Similarly, both cities appear to feature only a few and minor urban planning actors as part of the transport governance networks. A big difference between the two cities exists in relation to the role of ‘integrators’. London features a significantly stronger presence of ‘integrators’ which have the ability to act as bridges between transport and urban planning decisions than NYC. It can be assumed that a more significant role of bridge-building integrators would assist with a greater policy capacity in deploying metropolitan accessibility policies.

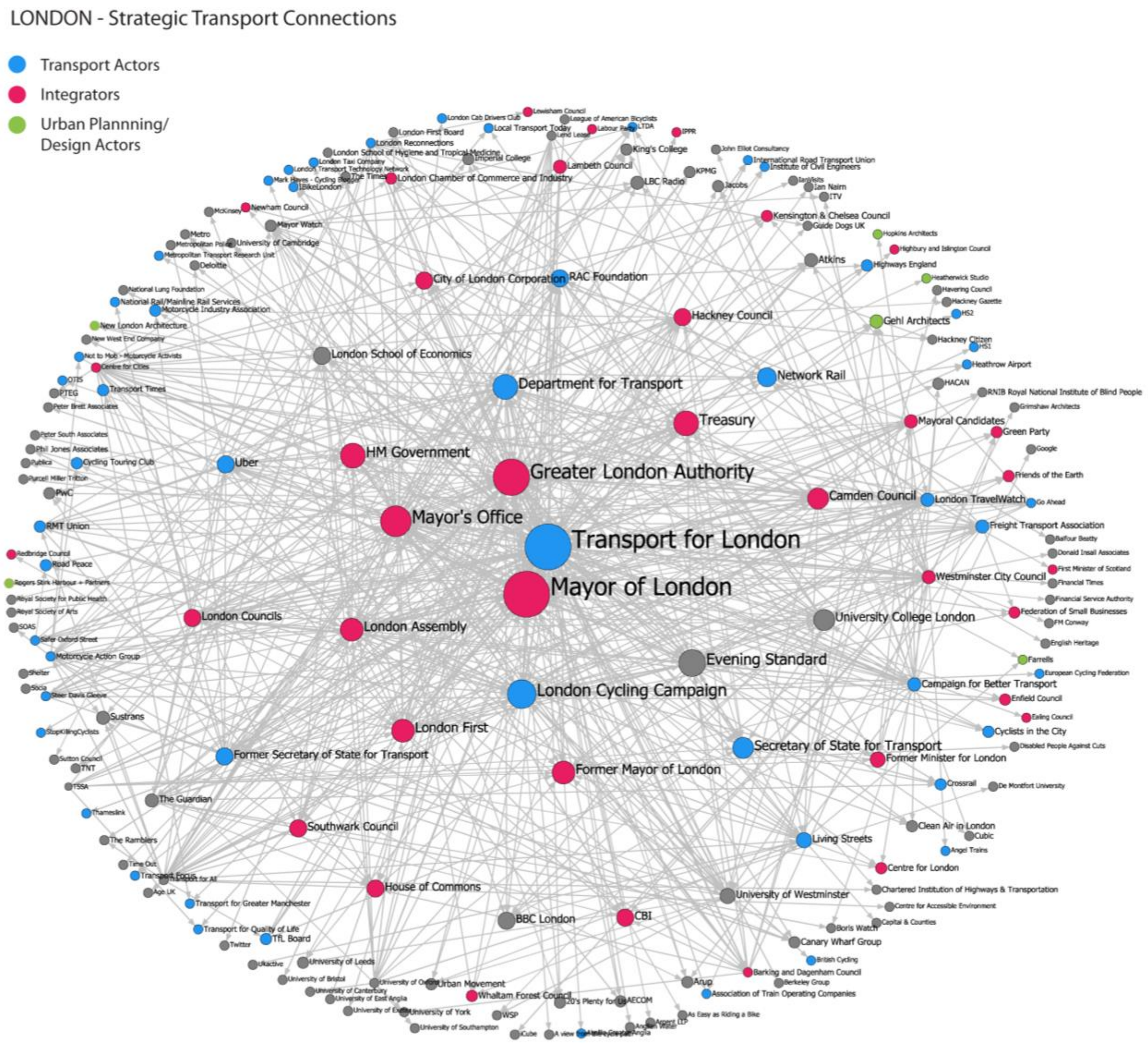

Figure 5: Transport governance network for London

Source: own representation based on LSE Cities (2017)

lined’ or ‘peripheral’ actors. Whereas in London we had to carry out 22 additional interviews to ensure comprehensiveness and that the addition of new actors (or nodes) to the dataset was consistently plateauing (making a total of 55 interviews), in NYC the second phase only required an extra five interviews (making a total of 40 interviews).

A closer look at these differences reveals that, in London, there are two main players at the 'centre' of the network whereas in New York the 'power' or capacity to 'influence' and 'steer' is shared (or fought for) by four to six actors of a very different type. The existence of more central 'integrators' in London becomes even clearer if we consider that the Governor of New York hardly plays this role (even though it could, potentially) and that the Regional Plan Association only has 'soft power' (i.e. no legal mandate and/or control over funding). Therefore, the only central real integrator between urban planning and transport in NYC is the Mayor, who sees his/her power severely constrained from above. Other actors such as the New York City Council, Partnership for New York City, the Tri-state Campaign and the governments of the neighbouring states of New Jersey and Connecticut (part of NYC's metropolitan or functional area) have less ability to influence policy integration in NYC.

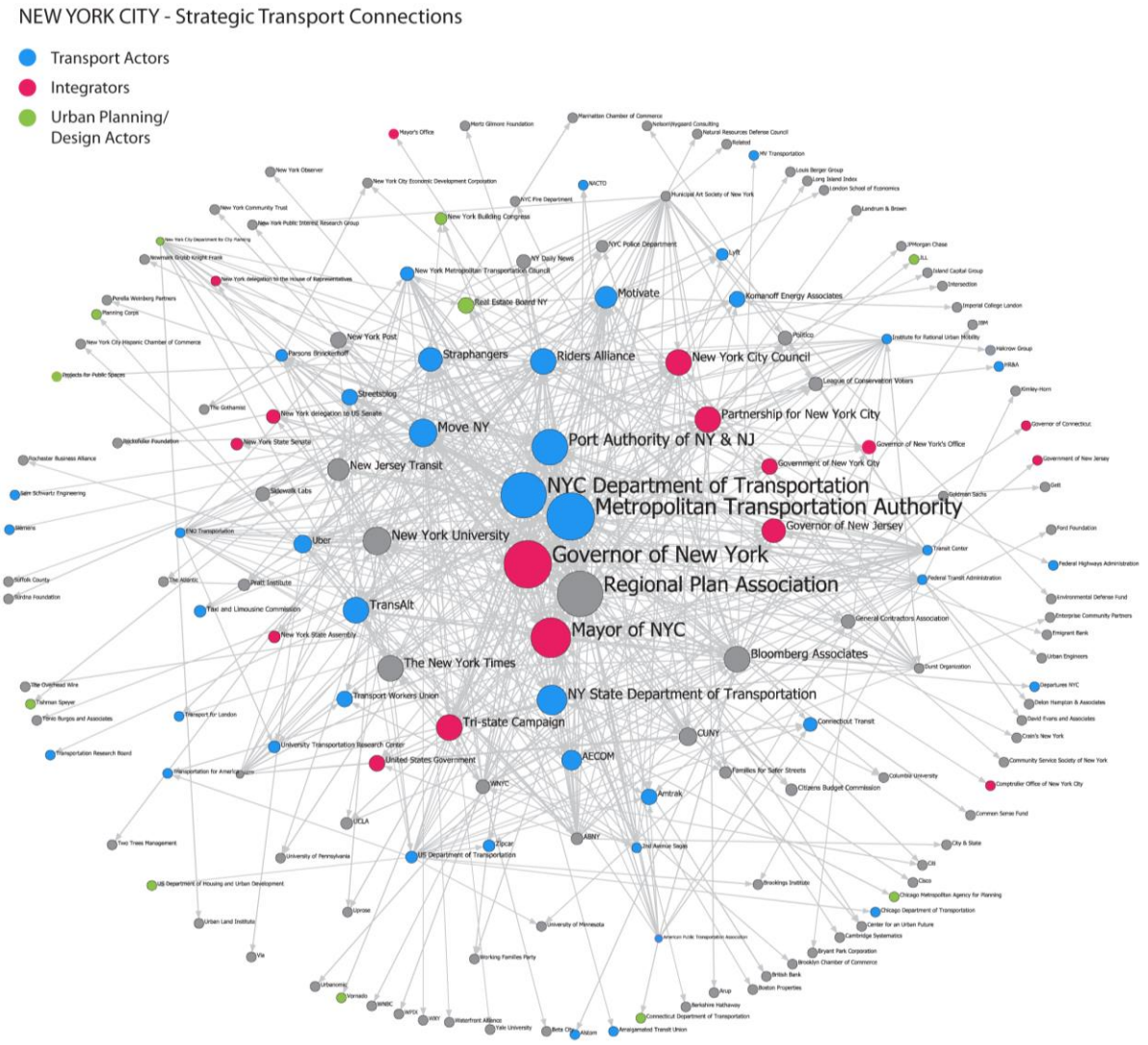

Figure 6: Transport governance network for NYC

Source: own representation based on LSE Cities (2017)

Furthermore, looking at the different governance levels involved, becomes clear that, in NYC, influence is shared between the city and the state governments although the state seems to hold more influence than the city (through the Governor of New York and the Metropolitan Transport Authority, which is controlled by the state). In London, the influence is clearly at the city-wide (government) level. In fact, the Mayor is quite a central figure in London who also has key controls over TfL (chairing and appointing its board members and appointing the transport commissioner).

In brief, London seems to be equipped with a greater capacity for deploying metropolitan accessibility strategies because its governance network is more dominated by actors that think about the whole system and therefore can act in an integrated manner. NYC's governance network is more dominated by actors that think about their part of the system and therefore act in a sector-specific manner.

By contrast, this analysis provides as with fewer clues less in relation to the cities' capacity for integrating shared mobility and mobility as a service. In both cases, start-up companies offering new mobility services based on new digital platforms (such as Uber, Lyft or Zipcar) do not seem to be centrally embedded network actors. Still, some activist or lobbying movements are gaining traction (e.g. pro-cycling or public transport) and their increased influence and impact on public opinion could drive the relevant authorities to view urban transport as an urban mobility and accessibility problem and therefore try to reap the potential benefits arising from the sharing and platform economy.

Conclusion

This paper introduced three empirical insights on policy capacities that may facilitate urban planning and transport policy integration and thus the implementation of an urban accessibility approach. Evidence from the Urban Governance Survey (LSE Cities et al. 2016) suggests that there is a large disconnect between capital intensive transport infrastructure (in particular, rail-based) and high level urban planning. This affects governmental capacity to pursue urban/metropolitan accessibility policies. However, the same survey suggests that capacity for integrating shared mobility and viewing mobility as a service may be higher (since several policy sectors with synergies in this regard seem to be controlled by the same government tiers).

Comparing the integration of strategic spatial planning and transport in London and Berlin, we argue that a traditional understanding based on the duality of hierarchical integration and network integration falls short of capturing the dynamics that exist in cities. Instead of a shift from hierarchical government to network governance, the research identified a surprising level of persistence, in some cases even of re-establishment, of top-down, hierarchical organisation that facilitated the integration of urban form and transport. At the same time, network arrangements do play an increasingly relevant role and also may have necessitated a new form of meta-governance to ensure that integration takes place, even in the context of more loosely and self-organised network actors.

Finally, the network analysis carried out in London and NYC shows how institutional environments can promote or deter the integration of planning and transport policies and nurture or curtail the capacity to shift to an accessibility paradigm. While actors that think about the whole system and therefore act in an integrated manner are more influential in London, NYC's governance network is more dominated by actors that think about their part of the system and arguably may act in a sector-specific manner.

Appendix – Ranking of policy pairings (least to most vertically aligned)

Pair	Total distance	Ranking
Suburban rail infrastructure - Strategic planning	9.13	1
Metro infrastructure - Strategic planning	7.81	2
Tram operations - Strategic planning	7.78	3
Metro infrastructure - Land use planning	7.70	4
Highway infrastructure - Strategic planning	7.31	5
Highway infrastructure - Land use planning	7.20	6
Suburban rail infrastructure - Transport & major infrastructure planning	7.09	7
Local roads operations - Transport & major infrastructure planning	7.04	8
Suburban rail infrastructure - Land use planning	7.04	9
Tram infrastructure - Strategic planning	7.03	10
Paratransit - Transport & major infrastructure planning	6.80	11
Urban design / walking - Suburban rail infrastructure	6.79	12
Tram operations - Transport & major infrastructure planning	6.74	13
Paratransit - Strategic planning	6.72	14
Traffic management - Transport & major infrastructure planning	6.57	15
Metro infrastructure - Transport & major infrastructure planning	6.56	16
Paratransit - Land use planning	6.55	17
Highway infrastructure - Density regulation	6.54	18
Local roads operations - Suburban rail infrastructure	6.50	19
Suburban rail infrastructure - Density regulation	6.49	20
Traffic management - Strategic planning	6.48	21
Cycling - Suburban rail infrastructure	6.48	22
Cycling - Highway infrastructure	6.45	23
Strategic planning - Design standards & building codes	6.45	24
Local roads operations - Strategic planning	6.43	25
Tram infrastructure - Transport & major infrastructure planning	6.43	26
Tram infrastructure - Land use planning	6.41	27
Highway infrastructure - Design standards & building codes	6.35	28
Taxi - Suburban rail infrastructure	6.34	29
Tram operations - Land use planning	6.34	30
Taxi - Land use planning	6.26	31
Traffic management - Land use planning	6.26	32
Main streets operations - Strategic planning	6.22	33
Highway infrastructure - Housing planning	6.19	34
Bus operations - Strategic planning	6.17	35
Main streets operations - Transport & major infrastructure planning	6.17	36
Cycling - Transport & major infrastructure planning	6.16	37
Local roads operations - Highway infrastructure	6.13	38
Taxi - Metro infrastructure	6.09	39
Taxi - Strategic planning	6.08	40
Highway infrastructure - Transport & major infrastructure planning	6.02	41
Urban design / walking - Highway infrastructure	6.00	42
Taxi - Transport & major infrastructure planning	5.93	43
Urban design / walking - Transport & major infrastructure planning	5.90	44
Local roads operations - Land use planning	5.89	45
Bus operations - Land use planning	5.89	46
Taxi - Tram infrastructure	5.89	47
Metro infrastructure - Housing planning	5.85	48
Tram infrastructure - Housing planning	5.85	49
Suburban rail infrastructure - Housing planning	5.84	50
Tram infrastructure - Design standards & building codes	5.81	51
Suburban rail infrastructure - Design standards & building codes	5.73	52
Bus operations - Suburban rail infrastructure	5.73	53
Local roads operations - Tram infrastructure	5.71	54

Traffic management - Tram infrastructure	5.70	55
Taxi - Housing planning	5.65	56
Main streets operations - Land use planning	5.64	57
Bus operations - Housing planning	5.63	58
Paratransit - Housing planning	5.62	59
Bus operations - Transport & major infrastructure planning	5.62	60
Urban design / walking - Metro infrastructure	5.60	61
Urban design / walking - Design standards & building codes	5.56	62
Cycling - Strategic planning	5.54	63
Local roads operations - Metro infrastructure	5.53	64
Main streets operations - Suburban rail infrastructure	5.53	65
Taxi - Density regulation	5.49	66
Paratransit - Density regulation	5.48	67
Strategic planning - Housing planning	5.46	68
Traffic management - Housing planning	5.44	69
Taxi - Design standards & building codes	5.43	70
Cycling - Land use planning	5.41	71
Cycling - Housing planning	5.41	72
Bus operations - Design standards & building codes	5.40	73
Strategic planning - Density regulation	5.36	74
Paratransit - Design standards & building codes	5.35	75
Paratransit - Metro infrastructure	5.35	76
Tram infrastructure - Density regulation	5.32	77
Tram operations - Housing planning	5.31	78
Main streets operations - Housing planning	5.31	79
Urban design / walking - Housing planning	5.23	80
Metro infrastructure - Design standards & building codes	5.22	81
Main streets operations - Metro infrastructure	5.21	82
Paratransit - Suburban rail infrastructure	5.19	83
Taxi - Traffic management	5.18	84
Paratransit - Highway infrastructure	5.16	85
Cycling - Tram operations	5.15	86
Urban design / walking - Tram infrastructure	5.10	87
Urban design / walking - Land use planning	5.07	88
Traffic management - Metro infrastructure	5.05	89
Local roads operations - Housing planning	5.02	90
Traffic management - Design standards & building codes	5.02	91
Urban design / walking - Paratransit	5.00	92
Cycling - Taxi	4.98	93
Metro infrastructure - Density regulation	4.95	94
Traffic management - Density regulation	4.92	95
Cycling - Traffic management	4.92	96
Taxi - Tram operations	4.91	97
Urban design / walking - Strategic planning	4.89	98
Tram infrastructure - Suburban rail infrastructure	4.88	99
Bus operations - Metro infrastructure	4.87	100
Paratransit - Traffic management	4.84	101
Local roads operations - Traffic management	4.77	102
Cycling - Metro infrastructure	4.77	103
Cycling - Design standards & building codes	4.76	104
Urban design / walking - Traffic management	4.72	105
Transport & major infrastructure planning - Design standards & building codes	4.71	106
Strategic planning - Transport & major infrastructure planning	4.71	107
Urban design / walking - Density regulation	4.70	108
Bus operations - Density regulation	4.70	109
Tram operations - Design standards & building codes	4.70	110
Local roads operations - Design standards & building codes	4.67	111
Cycling - Paratransit	4.67	112
Local roads operations - Tram operations	4.66	113
Paratransit - Tram infrastructure	4.66	114

Traffic management - Suburban rail infrastructure	4.63	115
Taxi - Local roads operations	4.62	116
Traffic management - Tram operations	4.61	117
Main streets operations - Design standards & building codes	4.60	118
Cycling - Local roads operations	4.55	119
Paratransit - Local roads operations	4.55	120
Tram operations - Suburban rail infrastructure	4.53	121
Bus operations - Traffic management	4.48	122
Paratransit - Tram operations	4.46	123
Cycling - Tram infrastructure	4.46	124
Paratransit - Bus operations	4.45	125
Main streets operations - Density regulation	4.43	126
Urban design / walking - Tram operations	4.41	127
Traffic management - Highway infrastructure	4.40	128
Tram operations - Density regulation	4.36	129
Bus operations - Tram infrastructure	4.34	130
Transport & major infrastructure planning - Density regulation	4.31	131
Bus operations - Highway infrastructure	4.31	132
Bus operations - Local roads operations	4.31	133
Land use planning - Design standards & building codes	4.30	134
Main streets operations - Highway infrastructure	4.30	135
Local roads operations - Density regulation	4.27	136
Cycling - Density regulation	4.25	137
Main streets operations - Tram infrastructure	4.21	138
Land use planning - Transport & major infrastructure planning	4.12	139
Cycling - Bus operations	4.07	140
Taxi - Highway infrastructure	4.06	141
Strategic planning - Land use planning	4.03	142
Tram operations - Highway infrastructure	4.03	143
Tram infrastructure - Highway infrastructure	4.02	144
Urban design / walking - Taxi	4.01	145
Land use planning - Housing planning	4.01	146
Paratransit - Taxi	3.99	147
Urban design / walking - Bus operations	3.90	148
Suburban rail infrastructure - Metro infrastructure	3.77	149
Tram operations - Metro infrastructure	3.76	150
Bus operations - Tram operations	3.72	151
Highway infrastructure - Suburban rail infrastructure	3.69	152
Main streets operations - Tram operations	3.65	153
Urban design / walking - Local roads operations	3.59	154
Housing planning - Density regulation	3.58	155
Land use planning - Density regulation	3.54	156
Urban design / walking - Main streets operations	3.54	157
Transport & major infrastructure planning - Housing planning	3.43	158
Paratransit - Main streets operations	3.42	159
Housing planning - Design standards & building codes	3.42	160
Urban design / walking - Cycling	3.39	161
Highway infrastructure - Metro infrastructure	3.38	162
Bus operations - Main streets operations	3.37	163
Cycling - Main streets operations	3.24	164
Taxi - Bus operations	3.04	165
Tram infrastructure - Metro infrastructure	2.94	166
Taxi - Main streets operations	2.88	167
Tram operations - Tram infrastructure	2.56	168
Local roads operations - Main streets operations	2.54	169
Density regulation - Design standards & building codes	2.47	170
Main streets operations - Traffic management	1.83	171

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