







SURVEY AND SPECULATION

Cities, infrastructure and the making of modern citizenship: the view from north-west Europe since c. 1870

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Abstract

Taking its cue from the ‘material turn’ of recent years, this survey examines the connections between infrastructure, welfare and citizenship in north European cities in the later nineteenth and twentieth centuries. It argues that connections between these different constructs were fundamental not only to how cities functioned but how citizens themselves were imagined. As such, the survey critiques histories of welfare and citizenship that foreground the national and neglect the urban origins of the modern state. It does so by examining infrastructure, welfare and citizenship in smaller European nation-states such as Belgium, Denmark and Ireland rather than in the more familiar cases of Germany, France and Britain. Asking questions about the inter-relationship of infrastructure, welfare and citizenship, the survey suggests, offers an important way to reinterpret what the ‘modern city’ meant in twentieth-century northern Europe.

What was the place of the city in citizenship in geographically proximate but politically and culturally different north European societies? Our objective in this survey is to explore the history of infrastructure networks across the later nineteenth and twentieth centuries in cities in four countries: Belgium, Denmark, Ireland and the UK. We concentrate, in particular, on the relationship between infrastructure systems, welfare and citizenship. This matrix seemed to offer something significant about urban society in each national context, from the secular welfare statism of Denmark to a country such as Ireland where politics and public life were permeated by the Catholic Church. Specifically, it enables us to focus on the question of citizenship as an urban rather than a national question.

Following the work of the sociologist Bryan Turner, we define citizenship broadly as ‘a social status that confers membership of a political community, [and] which in turn determines an individual’s share in the collective resources

of such a community'.¹ This formulation distinguishes citizenship from the nineteenth-century concept of the citizen as a *de facto* member of a national community while invoking the twentieth-century notion of 'welfare citizenship' in which the citizen is seen as constituted by civil society as much as by the nation-state and to have social rights related to individual and collective needs. Echoed here is T.H. Marshall's famous dictum that posited a historical transition from political to social citizenship, the latter reaching its apotheosis in the creation of welfare states on the social democratic model, epitomized by the Scandinavian countries.² However, our interest is in a further dimension of the subject, to do with the way in which modern infrastructure networks of water, electricity, transport and so on have themselves undergirded the 'welfare citizen' in ways often obscured to historical view.

The twentieth century saw the rise of welfarism in north-west Europe as one of the anchors of modern politics. Politics came to be organized around the provision of welfare – social security, education and health care. Commentators have identified different types of welfare state. Best known perhaps is Gosta Esping-Andersen's model of three types of welfare capitalism: liberal, in which the market is preferred as the provider of social needs; conservative, in which the family is centre-stage; and social democratic states characterized by universalistic provision and an expansive definition of individual need.³ We might see each of the countries selected for study here as representing a distinct 'world of welfare capitalism': liberal in the case of the UK, social democratic in the case of Denmark and conservative in the case of Ireland, with Belgium arguably in between liberal and conservative types.

Esping-Andersen's model has drawbacks. It does not appear to allow for historical change in which welfare states moved between these 'worlds' at different points in time. Moreover, whichever type of welfare capitalism is described (not just by Esping-Andersen), the historical development that produced it tends to be interpreted as a project of national and state institutions and of the extension of welfare 'rights' to citizens. Welfare thus became an integral part of modern citizenship: citizens contributed through taxation to the provision of welfare services and in return became entitled to them. In this survey, however, we shift the focus by foregrounding the significance of material infrastructure networks – water supply, gas and electricity, roads – in underpinning welfare politics and modern citizenship. To be part of the 'national' community increasingly meant to have access to clean water, electricity and communications. The emergence of the 'networked home' by the 1950s can be understood as a prime marker of welfare modernism. Alternatively, to be deprived of access to water or other utilities meant to be disqualified from the full rights of citizenship.

In approach, the survey represents a historiographical overview of fields of study – infrastructure networks, citizenship and welfare – that have been manifestly important to twentieth-century urban history but that have remained somewhat separate in analytical practice. Putting them together, we argue, opens up novel

¹B.S. Turner, 'Contemporary citizenship: four types', *Journal of Citizenship and Globalisation Studies*, 1 (2017), 11; see also B.S. Turner, *Rights and Virtues* (Oxford, 2009).

²T.H. Marshall, *Citizenship and Social Class* (Cambridge, 1950).

³G. Esping-Andersen, *The Three Worlds of Welfare Capitalism* (Princeton, 1990).

ways of approaching subjects such as governance and urban identity, which are often seen in a rather abstract, idealized way as if ‘material powers’ and technology can somehow be bracketed off from questions of political ideology and subjectivity.⁴ Furthermore, an infrastructure perspective on citizenship can offer alternative means to capture social inequality and exclusion, adding to the descriptive and explanatory traction of these analytical categories. In effect, we are seeking to reinsert infrastructure networks back into the discussions of ‘material powers’ that have occurred, somewhat sporadically it has to be said, in historical studies of modern urban governance over the last decade and more.⁵

The survey proceeds in the following fashion. First, we survey studies of infrastructure networks in urban history and related fields such as urban studies and transport history. The survey then addresses urban citizenship, suggesting how studies have begun to elucidate the significance of the city in shaping modern citizens and welfare before (as well as after) the advent of the ‘welfare state’. Thirdly, we move to consider the salience of small European countries, like Belgium, Denmark and Ireland, in illuminating these questions as well as their value for comparative study. Finally, the survey concludes by examining briefly a number of case-studies that outline the historical imbrication of infrastructure, welfare and urban citizenship, suggesting the benefits of analysing these historical categories as an ensemble. By so doing, we may be able to piece together a history of modern European cities that is as yet largely untold.

The historiographical context

Urban history, transport history, planning history and the broader field of urban studies have all addressed aspects of infrastructure and socio-spatial relations. Yet the interaction between infrastructure, spatial transformation and socio-political in/exclusion – or indeed citizenship – tends to be neglected. The relation between infrastructure and social in/exclusion in the built environment is being increasingly addressed by urban history, driven by the professed ‘spatial turn’. Early publications of scholars such as Stanley Schultz and Clay McShane, Joel Tarr and Gabriel Dupuy, and Antoine Picon have proposed technical systems as key drivers of urban transformation,⁶ but it is only recently that infrastructure has received sustained attention. We have seen an upsurge of infrastructure studies, focusing on roads, railways, water, energy, light and air in the European city.⁷ These

⁴T. Bennett and P. Joyce (eds.), *Material Powers: Cultural Studies, History and the Material Turn* (London, 2013).

⁵For useful overviews, see F. Trentmann, ‘Materiality in the future of history: things, practices and politics’, *Journal of British Studies*, 48 (2009), 283–307; S. Gunn and T. Hulme, ‘Introduction: unravelling urban governance’, in S. Gunn and T. Hulme (eds.), *New Approaches to Governance and Rule in Urban Europe since 1500* (London, 2020), 1–23.

⁶See S.K. Schultz and C. McShane, ‘To engineer the metropolis: sewers, sanitation, and city planning in late nineteenth-century America’, *Journal of American History*, 65 (1978), 389–411; J.A. Tarr and G. Dupuy, *Technology and the Rise of the Networked City in Europe and America* (Philadelphia, 1988); A. Picon, *French Architects and Engineers in the Age of Enlightenment* (Cambridge, 1998).

⁷Examples include T. Moss, *Remaking Berlin. A History of the City through Infrastructure, 1920–2020* (Cambridge, MA, 2020); S. Gunn and S.C. Townsend, *Automobility and the City in Twentieth-Century Britain and Japan* (London, 2019); E. Shove and F. Trentmann (eds.), *Infrastructures in Practice: The*

studies are particularly strong in capturing the urban effects of infrastructure in terms of social inequality and the social imaginary. In addition, urban historians have successfully demonstrated the analytical advantages of adopting an infrastructure perspective when studying urban governance and culture.⁸ Yet, the physical, techno-material dimension of infrastructure is considered a 'black box', acknowledged in passing but not analysed for its contents or effects.⁹ Its materiality and technological traits could help us understand in what ways infrastructure mediates citizenship: how it connects or disconnects people; how it differentiates the quality of service, where and for whom; how everyday access and use of infrastructure generates acts of citizenship, showcasing how citizens exercise and perform their rights.¹⁰ Furthermore, opening the black box of technology and approaching infrastructure from a Science Technology Society (STS) perspective, analysing socio-political agendas driving technology, could illuminate how this mediation was intended during the conception phase and indeed not only approach infrastructure as a representation of, or proxy for, citizenship, but as an instrument fundamentally co-producing socio-political processes. In addition, as Colin Pooley has highlighted, relations between urban history, transport history and mobility studies are underdeveloped.¹¹ An alliance between these approaches could tap into questions about the political dimensions of infrastructure and the differentiated political practices of welfare states more specifically.

Transport history has a robust tradition of analysing transport technology in relation to politics and ideology, with concepts of modernization, nation-building and economic drivers as dominant aspects of the research. A great number of studies have shown that nation-states and empires actively deployed transport infra-

Dynamics of Demand in Networked Societies (London, 2019); C. Lopez-Galviz, *Cities, Railways, Modernities: London, Paris, and the Nineteenth Century* (London, 2019); M. Thelle, 'The meat city: urban space and provision in industrial Copenhagen, 1880–1914', *Urban History*, 45 (2018), 233–52; C. Hein, 'Oil spaces: the global petroleumscape in the Rotterdam/The Hague area', *Journal of Urban History*, 44 (2018), 887–929; M. Dikeç, "'The modern atlas": compressed air and cities, c. 1850–1930', *Journal of Historical Geography*, 53 (2016), 11–27; J. Hillier, 'Implementation without control: the role of the private water companies in establishing constant water in nineteenth-century London', *Urban History*, 41 (2014), 228–46; G. De Block, 'Planning rural–urban landscapes: railways and countryside urbanisation in South-West Flanders, Belgium (1830–1930)', *Landscape Research*, 39 (2014), 542–65; C. Otter, *The Victorian Eye: A Political History of Light and Vision in Britain, 1800–1910* (Chicago, 2008); K. Chatzis and O. Coutard, 'Water and gas: early developments in the utility networks of Paris', *Journal of Urban Technology*, 12 (2005), 1–17; M.V. Melosi, *The Sanitary City: Urban Infrastructure in America from Colonial Times to the Present* (Baltimore, 1999).

⁸See for example T. Hulme, *After the Shock City: Urban Culture and the Making of Modern Citizenship* (Woodbridge, 2019); Otter, *The Victorian Eye*; P. Joyce, *The Rule of Freedom: Liberalism and the Modern City* (London, 2003).

⁹S. Graham and S. Marvin, *Splintering Urbanism. Networked Infrastructures, Technological Mobilities and the Urban Condition* (London, 2001); M.V. Melosi, 'Humans, cities, and nature: how do cities fit in the material world?', *Journal of Urban History*, 36 (2010), 3–21.

¹⁰C. Lemanski (ed.), *Citizenship and Infrastructure: Practices and Identities of Citizens and the State* (London and New York, 2019).

¹¹C. Pooley, 'Connecting historical studies of transport, mobility and migration', *Journal of Transport History*, 38 (2017), 251–9.

structure networks to build and strengthen their economies and political identities.¹² Still, while transport historians have effectively pierced the aura of objectivity of technology and uncovered its ties with politics, transport histories have a penchant for portraying infrastructure systems as the straightforward and clean translation of the abstract and grand rhetoric of national (or imperial) socio-economic and political ideals. Recently, scholars in the field have argued for more multidimensional analyses, bringing in asymmetrical relations between transport and modernization agendas, or indeed showing that infrastructure networks are not the result of an overall, all-encompassing national agenda and nor do they generate uniform societal development.¹³ Although recent works aim at revealing the ambiguous nature of transport infrastructure, they generally remain at the level of policy-making and do not speak to questions of power or socio-political inclusion, nor to the disposition of socio-spatial development generated by infrastructure.¹⁴

By contrast, in both urban and mobility studies, strong voices have called for recognition of how infrastructural complexes configure, enable and disable mobilities, which in turn results in 'splintering urbanism' or, more generally, in socio-spatial processes of de- and re-territorialization with knock-on effects for the performance of citizenship, beyond legalistic or statist definitions.¹⁵ Geographers such as Erik Swyngedouw and Colin McFarlane have effectively mobilized infrastructure as a lens to analyse shifting and radically uneven socio-spatial transformations.¹⁶ Most of these studies focus on inter-scalar spatial restructuring of urban infrastructure. But how the city as a specific locus is implicated and produced by practices of and conflicts over movement of people has been largely untapped.¹⁷ How specific

¹²For example M. Bess, 'Routes of conflict: building roads and shaping the nation in Mexico, 1941–1952', *Journal of Transport History*, 35 (2018), 78–96; M. Moraglio, *Driving Modernity. Technology, Experts, Politics, and Fascist Motorways, 1922–1943* (New York, 2017); R.E. Ficek, 'Imperial routes, national networks and regional projects in the Pan-American Highway, 1884–1977', *Journal of Transport History*, 37 (2016), 129–54; P. Høgselius, A. Kaijser and E. van der Vleuten, *Europe's Infrastructure Transition: Economy, War, Nature* (London, 2016); J. Guldi, *Roads to Power: Britain Invents the Infrastructure State* (Cambridge, MA, 2012); E. Weber, *Peasants into Frenchmen: The Modernization of Rural France, 1870–1914* (London, 1977).

¹³See for example H. Perreira Silva, 'Railway imperialism revisited: the failed line from Macao to Guangzhou', *Technology and Culture*, 62 (2021), 82–104; M. Moraglio, 'Seeking a (new) ontology for transport history', *Journal of Transport History*, 38 (2018), 3–10; C. Divall and G. Revill, 'No turn needed: a reply to Michael Freeman', *Journal of Transport History*, 27 (2006), 144–9; C. Divall and G. Revill, 'Cultures of transport. Representation, practice and technology', *Journal of Transport History*, 26 (2005), 99–111.

¹⁴C. Otter, 'The technosphere: a new concept for urban studies', *Urban History*, 44 (2017), 145–54; K. Easterling, *Extrastatecraft: The Power of Infrastructure Space* (New York, 2014).

¹⁵Lemanski (ed.), *Citizenship and Infrastructure*; L.A. Staeheli, P. Ehrkamp, H. Leitner and C.R. Nagel, 'Dreaming the ordinary: daily life and the complex geographies of citizenship', *Progress in Human Geography*, 36 (2012), 628–44; L.A. Staeheli, 'Political geography: where's citizenship?', *Progress in Human Geography*, 35 (2011), 393–400; K. Hannam, M. Sheller and J. Urry, 'Editorial: mobilities, immobilities and moorings', *Mobilities*, 1 (2006), 1–22; N. Brenner, *New State Spaces: Urban Governance and the Rescaling of Statehood* (Oxford, 2004).

¹⁶See for example C. McFarlane and J. Silver, 'The political city: "seeing sanitation" and making the urban political in Cape Town', *Antipode*, 49 (2017), 125–48; E. Swyngedouw, *Liquid Power: Contested Hydro-Modernities in Twentieth-Century Spain* (Cambridge, MA, 2015).

¹⁷Hannam, Sheller and Urry, 'Editorial: mobilities, immobilities and moorings'.

places are entangled within complex networks, producing practices which encourage access or construct barriers for mobile people remains a blind spot in both urban and mobilities studies.¹⁸ Additionally, the majority of twentieth-century scholarship has been characterized by a deeply rooted ‘recentism’, with an exclusive focus on the post-war period. Although Neil Brenner and Nik Theodore have underlined that there is no such thing as a linear transition from the welfare city to a neoliberal city,¹⁹ most research in urban studies has built on the assertion of a cohesive, unitary, supply-driven networked city being splintered, or ‘unbundled’,²⁰ by neoliberal regimes of demand-driven privatization. Although there are a few studies demonstrating that infrastructure–urbanization relations have always been splintered, unequal and contested, these critical analyses focus mostly on non-western contexts. Topical work in political geography, for instance, often adopts an infrastructural lens as analytic entry into (post-)colonial urban history.²¹ If studies connect the material and political, or more specifically, approach infrastructure as key to the process of belonging and citizenship, the focus is also mostly on non-western, post-colonial contexts.²² Most studies assume that western welfare infrastructure serviced the city in an equal, homogeneous fashion.

This survey thus answers to recent calls in urban and mobility studies as well as urban and transport history by drawing attention to the material politics of infrastructure, or how complex infrastructural networks produced practices that encouraged access to or constructed barriers for mobility and, *in extenso*, citizenship. Urban and mobility studies have largely ignored how the city and its citizens are involved in, and produced by, practices of and conflicts over movement. Equally, urban and transport history have paid limited attention to contested arrangements between politics, networks and specific socio-spatial development. Although transport history has a robust tradition of analysing transport networks, it often focuses on political rhetoric using infrastructure as a *pars pro toto* for modernization and nation-building. Urban history, on the other hand, mainly focuses on the effects of infrastructure, generally approaching the materiality of the network as a black box, taken for granted and thus unexamined. How material networks were conceived so

¹⁸Though see M. Middell and K. Naumann, ‘Global history and the spatial turn: from the impact of area studies to the study of critical junctures of globalization’, *Journal of Global History*, 5 (2010), 149–70; S. Gunn, ‘Spatial mobility in later twentieth-century Britain’, *Contemporary British History* (published online, 14 Jan. 2021).

¹⁹N. Brenner and N. Theodore, ‘Cities and the geographies of “actually existing neoliberalism”’, *Antipode*, 34 (2002), 349–79.

²⁰J. Rutherford, ‘Unbundling Stockholm? The networks, planning and social welfare nexus beyond the unitary city’, *Geoforum*, 39 (2008), 1871–83.

²¹See for example S. Banerjee, *Memoirs of Roads: Calcutta from Colonial Urbanization to Global Modernization* (New Delhi, 2016); M. Gandy, *The Fabric of Space: Water, Modernity, and the Urban Imagination* (Cambridge, MA, 2014); M. Kooy and K. Bakker, ‘Splintered networks: the colonial and contemporary waters of Jakarta’, *Geoforum*, 36 (2008), 1843–58; L. Bigon, ‘Tracking ethno-cultural differences: the Lagos steam tramway, 1902–1933’, *Journal of Historical Geography*, 33 (2007), 596–618; J. Broich, ‘Engineering the empire: British water supply systems and colonial societies, 1850–1900’, *Journal of British Studies*, 46 (2007), 346–65; T. Mitchell, *Rule of Experts: Egypt, Techno-Politics, Modernity* (Berkeley, 2002).

²²See Lemanski (ed.), *Citizenship and Infrastructure*; L. Björkman, *Pipe Politics, Contested Waters: Embedded Infrastructures of Millennial Mumbai* (Durham, NC, 2015).

as to generate a specific socio-spatial, and indeed urban, configuration remains a lacuna. This survey therefore proposes a conceptual frame bringing together urban history, transport history and urban studies to study the co-production of infrastructure networks, the welfare city and modern citizenship.

Citizenship, infrastructure and the urban

The understanding of citizenship, welfare and infrastructure that present-day societies have inherited in Europe has been framed very largely at the level of the nation-state. Citizenship means to 'belong' to a nation-state and to have rights there, such as protection under the law, free movement and (for adults) the right to vote. Citizenship in the course of the twentieth century also increasingly meant to have rights to welfare – to education, health insurance, social security – in return for an acceptance of duties such as conscription in times of war. The 'welfare state' and the nation-state became conjoined. As a recent commentary puts it, citizenship 'is not only a European-wide phenomenon – an integral institutional element of modern European history – but is also...shaped by the distinctive political and national features of the individual state'.²³ Infrastructure, as we have seen, is also often presented by historians and others as a national enterprise, such as railways in the nineteenth century or electrification in the twentieth. Indeed, it is commonplace to see the embedding of infrastructure as an integral part of 'nation-building'.²⁴

This identification of citizenship, welfare and infrastructure with the nation-state is not wrong but it is partial. Just as welfare, even in the twentieth century, was never a state project alone but involved all sorts of other voluntary agencies – charities, churches, trade unions – so citizenship, welfare and infrastructure for much of the late nineteenth and twentieth centuries were shaped by the local and the urban as much as – and in some cases more than – the national. As Daniel Rodgers observed, writing on the history of transatlantic social progressivism, if national governmental action was seen as the answer to the 'urban crisis' of the 1970s and 1980s, then a century earlier 'the formula was reversed. If the nation was to be reformed it was by first seizing the social possibilities of the cities'.²⁵ The decades before World War I witnessed what has been termed the 'transnational municipal moment', much of which was technical: systems of gas and water supply, sewerage and roads. As the American journalist and social reformer Albert Shaw put it in 1895, 'Municipal government, from Scotland to Hungary, is exalting the bacteriologist and the sanitary inspector.' The years leading up to World War I saw the establishment of a host of international bodies focused on cities and infrastructure, such as the Permanent International Association of Road Congresses (1909) and the International Union of Local Authorities (1913). Urban historians have done much to illuminate this

²³D. Gosewinkle, *Nation and Citizenship from the Late Nineteenth Century Onwards: A Comparative European Perspective* (Brussels, 2008), iii.

²⁴For example see Swyngedouw, *Liquid Power*; D. Blackbourn, *The Conquest of Nature: Water, Landscape and the Making of Modern Germany* (London, 2006); L. Hannah, *Electricity before Nationalisation: A Study of the Development of the Electricity Supply Industry in Britain* (London, 1979).

²⁵D.T. Rodgers, *Atlantic Crossings: Social Politics in a Progressive Age* (Cambridge, MA, 2000), 112. While ostensibly transnational, Rodgers' study is centrally about the relationships between cities in Europe and North America. The quotation here is drawn from a chapter called 'The self-owning city'.

and subsequent ‘municipal moments’, but their focus has been on knowledge exchange and political networks rather than on the embedding of infrastructure technologies and their implications for urban governance and urban populations at large.²⁶

In the decades of the late nineteenth and early twentieth centuries, cities came to act as laboratories for social experimentation; this was an important component of their claim to represent a new type of urban modernity. In newly unified Germany after 1871, for example, city governments, often supported by the SPD, pioneered forms of social insurance for workers, in advance of the Wilhelmine state. Local authorities in cities like Krefeld, Essen and Mannheim sought to mediate between capital and labour by establishing labour exchanges and setting up a system of unemployment insurance. George Steinmetz has pointed out that such interventions rested on an implicit understanding of a distinction between the roles of the local and the central state. In Germany, ‘the “ideology of the city” constructed local government as a sort of extension of society, in contrast to the Hegelian “idea of the state” as an autonomous entity hovering over society’.²⁷ The framework of an essentially municipal system of social insurance persisted in much of northern Europe, including Scandinavia, until the inter-war period or later. Even in liberal Britain, a city such as Manchester in the inter-war years possessed a strong local government commitment to an ideal of the ‘social city’ in which citizens’ needs would be met, first and foremost, through municipal provision. This vision of the primacy of the urban local was encapsulated in the figure of E.D. Simon, long-term councillor and mayor of Manchester in 1921–22, who framed citizenship (and the associated practice of ‘civics’) largely in terms of the relationship between the individual and the municipal authority. In Simon’s terms, ‘emotional belonging’ was to the city as well as (sometimes rather than) the nation-state. Council housing, public libraries, schools and health care formed part of this all-encompassing vision. Nor was it confined to cities such as Manchester. In a British text entitled *The Good Citizen*, which went through five editions in the 1930s, citizenship was defined in terms of rights to health, education and recreation facilities and duties to pay the rates and obey regulations, the great majority of which were understood to be ‘civic’ and municipal in character.²⁸

If citizenship in the early twentieth century rested, to an extent not always recognized, on municipally oriented welfare, then the municipal itself rested on urban infrastructure. The environment of *The Good Citizen* was serviced by the army of municipal employees – dustmen, road-menders, tram-drivers, electricians, gas-fitters – who maintained the material fabric and infrastructure technologies that

²⁶P.-Y. Saunier, ‘Introduction’, in P.-Y. Saunier and S. Ewen (eds.), *Another Global City: Historical Explorations into the Transnational Municipal Moment, 1850–2000* (Basingstoke, 2008), 1–18; A. Shaw, *Municipal Government in Continental Europe* (London, 1895), vi; S. Ewen and M. Hebbert, ‘European cities in a networked world during the long twentieth century’, *Environment and Planning C: Government and Policy*, 25 (2007), 327–40.

²⁷G. Steinmetz, *Regulating the Social: The Welfare State and Local Politics in Wilhelmine Germany* (Princeton, 1993), 216.

²⁸T. Hulme, ‘Putting the city back into citizenship: civics education and local government in Britain, 1918–1945’, *Twentieth Century British History*, 26 (2015), 26–51; C. Higham, *The Good Citizen: An Introduction to Civics* (London, 1934).

made the city work.²⁹ The numbers employed in such jobs were substantial; Glasgow, for instance, counted over 10,000 municipal workers by the 1890s and electricity, tramways and sanitation departments.³⁰ As technologies of water supply, gas and electricity were installed from the later nineteenth century onwards, this was often accomplished on a city by city rather than a regional or national basis. Providers might be private companies or municipal departments, but they tended to operate within urban boundaries; rural areas were often later to be incorporated into networks, even if in some countries, like Belgium, integration was reasonably swift.³¹ As Dieter Schott observes, 'Cities were the decisive actors as well as the most important playing field during the first two decades of electrification.'³² Despite the construction of regional and national infrastructure networks, like the South Finland Power Company and the British National Grid, utilities such as water, electricity and gas supply remained city-focused until after World War II since many urban authorities owned the utilities within their boundaries. In Denmark, Britain and elsewhere, the telephone network, for example, was largely established around the turn of the twentieth century as a municipal enterprise.³³ In effect, European cities were not just laboratories for experiments in welfare and citizenship but also in the infrastructure of urban life; these three pillars of modernity were, in historical terms, integrally related.

Re-focusing attention on Europe's cities thus enables us to recover a submerged dimension of the history of modern citizenship, obscured by the concentration on the nation-state as the principal framework for understanding modern societies. In contrast to the rather abstract and schematic accounts of urban theory and policy, historical analysis can provide empirical examples of how citizenship was 'made' in the material encounter between urban systems and human needs. Providing specific, concrete cases, an urban perspective allows us to unpick the ways in which modern citizenship was forged, importantly if not exclusively, in relationship to welfare and became embedded – often to the point of invisibility – in the networks of infrastructure which would in turn produce such normative environments as the networked home, the company office, the hospital ward and the 'modern city' itself. If there is such a thing as an unwritten history of modernity, an essential ingredient of that story lies hidden beneath city streets in the wires, cables and pipes that are the precondition and generator of the rights and amenities we take for granted in the contemporary developed world. It is only when, due to war or environmental disaster, that systems shut down – as in New Orleans following Hurricane Katrina or the siege of Sarajevo during the Yugoslav war – that our dependence on them for the means of life are made brutally apparent. Disaster in this respect

²⁹Hulme, 'Putting the city back into citizenship', 35.

³⁰I. Maver, 'A (North-) British end-view: the comparative experience of municipal employees and services in Glasgow 1800–1950', in M. Dagenais *et al.* (eds.), *Municipal Services and Employees in the Modern City* (Oxford, 2016), 188.

³¹D. Bruggeman and M. Dehaene, 'Urban questions in the countryside? Urbanization and the collective consumption of electricity in early 20th century Belgium', *Planning Perspectives*, 32 (2017), 309–32.

³²D. Schott, 'Empowering European cities: gas and electricity in the urban environment', in M. Hård and T.J. Misa (eds.), *Urban Machinery: Inside Europe's Cities* (Cambridge, MA, 2008), 176.

³³T. Hughes, *Networks of Power: Electrification and Western Society 1880–1930* (London, 1983); Schott, 'Empowering European cities', 176–84.

serves as a mirror image, revealing the techno-social infrastructure that came to undergird European societies from the later nineteenth century.

Cities in the small nation-state: Belgium, Denmark and Ireland

The study of urban infrastructure must inevitably consider the place of cities not as isolated entities but within their greater geo-spatial contexts. As Keith Hoggart has recently shown, terms such as ‘city hinterland’, ‘peri-urban’, ‘the rural–urban fringe’ and ‘exurbs’ acknowledge the practical and theoretical difficulties in defining the outer limits of an urban entity.³⁴ Indeed, urban historians are familiar with the complexities and limitations of what is meant by ‘urban infrastructure’. Water, for example, may be piped from reservoirs in mountains hundreds of kilometres from cities.³⁵ Commuter railway networks, too, as in late nineteenth-century Belgium, penetrated deep into the city’s rural surroundings, diffusing the urban labour market and blurring the boundaries between city and nation.³⁶ As Aprodicio Laquian and others have demonstrated, some of the most remarkable examples of the geographical reach of cities are now to be found in the ‘mega-urban’ or ‘mega-city’ regions of Asia, where older definitions of the ‘urban’ can no longer be maintained. Similarly, from an urban studies perspective, Peter Hall and Kathy Pain outline the contemporary dynamics of what they term the ‘polycentric metropolis’ in various European countries.³⁷

The ever-increasing spread of the urban hinterland has, it can be argued, particular implications for cities in smaller countries, where the national territory is composed of a relatively small number of cities and their associated peripheries. This is especially apparent in Europe, with its uniquely porous nation borders, its overarching European Union legal framework and its many urban hinterlands straddling more than one nation-state (Geneva, Malmö, Lille).³⁸ Paola Viganò and others have recently proposed a new theoretical concept – the ‘horizontal metropolis’ – to better understand the full reach of the impact of cities, with Swiss cities emerging as a useful example.³⁹ Following the recent turn within ethnographic studies towards the political and social characteristics of ‘small countries’,

³⁴K. Hoggart, ‘City hinterlands in European space’, in K. Hoggart (ed.), *The City’s Hinterland: Dynamism and Divergence in Europe’s Peri-Urban Territories* (Abingdon, 2016), 1–18.

³⁵Swyngedouw, *Liquid Power*.

³⁶G. De Block and J. Polasky, ‘Light railways and the rural–urban continuum: technology, space and society in late nineteenth-century Belgium’, *Journal of Historical Geography*, 37 (2011), 312–28; G. De Block, I. Schepers and J. Polasky, ‘Organising the home–work split by the urban–rural link: transport networks, mobility, and its socio-spatial (side-)effects in early 20th century Belgium’, paper at T2M conference, Oct. 2019.

³⁷A.A. Laquian, *Beyond Metropolis: The Planning and Governance of Asia’s Mega-Urban Regions* (Baltimore, 2005); J. Xu and A.G.O. Yeh (eds.), *Governance and Planning of Mega-City Regions: An International Comparative Perspective* (London, 2011); P. Hall and K. Pain, *The Polycentric Metropolis: Learning from Mega-City Regions in Europe* (New York, 2006).

³⁸J. Palmowski, ‘The Europeanization of the nation-state’, *Journal of Contemporary History*, 46 (2011), 631–57; A. Van Wageningen, ‘2031: the year the city disbanded the state’, in A. Van Wageningen and V. Mamadouh (eds.), *Urban Europe: Fifty Tales of the City* (Amsterdam, 2016), 399–404.

³⁹Many of its key theorists are based at the Laboratory of Urbanism at Lausanne in Switzerland. P. Viganò et al., ‘Rethinking urban form: Switzerland as a “horizontal metropolis”’, *Urban*

we can extend Hoggart's analysis beyond larger European countries (in his case Spain, Germany, England and France) to look at the dynamics of urban infrastructure in smaller countries (which in practice constitute the majority of European Union members), and specifically here Belgium, Denmark and Ireland.⁴⁰ As Ulf Hannerz and Andre Gingrich argue, in smaller nation-states 'borders are always nearby: the whole country may be more or less a borderland' – a condensed example of Anthony Giddens' description of the state as a 'bordered power-container'.⁴¹ In a similar vein, states may also be imagined as a single – or a limited number of – urban hinterland(s). In smaller countries, the urban can thus play an even greater role in the development of 'national' infrastructures. Furthermore, reflecting on countries such as Singapore, Norway and New Zealand, Hannerz and Gingrich argue that small countries 'function well as laboratories where social experiments can be performed – even as sites for utopian thought turned into practice'.⁴² This has, of course, been long argued for cities themselves, especially in colonial contexts. In the case of geographically smaller countries, the urban dynamic arguably plays a critical role in the complex interplay between citizenship, welfare, the city and the nation-state. It is thus possible to offer a counter-response to Gylfi Gislason's claim, based on a political career in post-war Iceland, that it is more difficult to 'arrive at solutions in a small society than in a large one'.⁴³ Perhaps there are advantages to being small.

The urban histories of cities such as Antwerp, Ghent, Dublin, Cork, Copenhagen and Aarhus – in how they engaged in different ways and at different times with ideas emerging from, among other places, their much larger neighbours Britain and Germany – make for a particularly rewarding study in a comparative context. The question of citizenship and movements between 'liberal', 'welfare' and perhaps 'neoliberal' governmentalities within these cities were uneven, patchy and occurred in remarkably varying circumstances for countries that are all within the relatively small geographical region of northern Europe. In some instances, for example, religious entities played quite major roles, in others they were almost entirely absent. What brings Ireland, Belgium and Denmark together is, to some extent, their size: all falling within what may be termed a distinctly Anglo-German socio-political orbit, and all with isomorphic national territory, populations and urban–rural structures. Some statistics demonstrate empirically the potential for applying concepts such as the 'horizontal metropolis' to the realm of these 'small countries': their total populations, since the late nineteenth century, have always been less

Planning, 2 (2017), 88–99; P. Viganò, C. Cavalieri and M. Barcelloni Corte (eds.), *The Horizontal Metropolis between Urbanism and Urbanization* (Cham, 2018).

⁴⁰U. Hannerz and A. Gingrich (eds.), *Small Countries: Structures and Sensibilities* (Philadelphia, 2017), 1–46. For the beginnings of this debate, see F. Barth (ed.), *Scale and Social Organization* (New York, 1978).

⁴¹Hannerz and Gingrich (eds.), *Small Countries*, 21; A. Giddens, *The Nation-State and Violence* (London, 1985), 119. See also more recently S. Elden, *The Birth of Territory* (Chicago, 2013), 1–18, 322–30.

⁴²Hannerz and Gingrich (eds.), *Small Countries*, 27.

⁴³G. Gislason, 'In defense of small nations', *Daedalus*, 113 (1984), 199–211.

than the metropolitan population of London.⁴⁴ The land-mass of all three, combined, easily fits into the present-day boundaries of Great Britain or Germany.⁴⁵ All three had, in 1900, a similar (and small) number of cities with a population of over 50,000 people, and capitals that were a similar (and modest) multiple of this number.⁴⁶

This smallness has, arguably, allowed particular forms of urban governmentality to develop, and distinctive relationships between the urban and the national in questions of citizenship and welfare. Ireland's smallness, for example, allowed British government officials in the mid-nineteenth century to plan 'national' railway infrastructure in remarkable detail, including by developing entirely new forms of cartography to represent trade flows, population density and even geology.⁴⁷ As Patrick Joyce has noted, it allowed the Ordnance Survey to map the country in internationally unprecedented detail for its time.⁴⁸ In more recent years, the confluence of small-scale and big data has allowed the Irish state to devise a new postcode system (Eircode) that gives each home in the national territory a unique signifier, a governmentality that eluded even the most dedicated of Victorian surveyors.⁴⁹ Similarly, in Belgium, infrastructure networks were based on the pursuit of specific socio-economic and political motives. In fact, public infrastructure was one of the few spatial components that were planned, financed, constructed and managed by the government. Shortly after Independence, in 1834, a centrally positioned public railway network was enacted that interconnected Belgian industrial regions and towns with their national and international markets as well as facilitated transit trade and mobility between European nations. Ideas of international connectivity went hand in hand with conceiving Belgium as a giant city, in which the railway united the great centres of intelligence and industry. Intensified by light railways from 1884, the densest network of rails known in the world operated on international, national and regional scales, including towns, industrial centres, as well as rural villages by the early twentieth century. Bolstered by cheap housing loans for workers, the government-led railway development had remarkable socio-economic and cultural effects on relations between cities and their hinterlands, not least a commuting culture and associated notions of welfare.⁵⁰ In Denmark, the small national territory following the loss of Schleswig-Holstein to Germany

⁴⁴1900 populations: Belgium (6.7m), Ireland (4.5m), Denmark (2.4m), metropolitan London (around 7m). Today: Belgium (11.4m), Ireland (excluding Northern Ireland) (4.8m), Denmark (5.6m), metropolitan London (14m).

⁴⁵Present-day (2020) data from the EU: Belgium (~30k km²), Ireland (excluding Northern Ireland) (~70k km²), Denmark (~43k km²), United Kingdom (~242k km²), Germany (~357k km²).

⁴⁶Belgium in c. 1900 (<https://lokstat.ugent.be>): Brussels (184,000), Antwerp (273,000), Liège (158,000), Ghent (160,000), Mechlin (56,000), Bruges (52,000). Ireland in c. 1900 (1901 Census data (*Preliminary Report*, p. 11)): Dublin (350,000), Belfast (350,000), Cork (75,000). Denmark in c. 1900 (1901 Census data (www.statistikbanken.dk)): Copenhagen (480,000), Aarhus (52,000).

⁴⁷P. Hession, 'Imagining the railway revolution in pre-Famine Ireland: technology, governance, and the Drummond Commission, 1832–39', in R.J. Butler (ed.), *Dreams of the Future in Nineteenth-Century Ireland* (Liverpool, 2021).

⁴⁸Joyce, *The Rule of Freedom*, 45–51.

⁴⁹*Irish Times*, 13 Jul. 2015.

⁵⁰De Block and Polasky, 'Light railways'; G. De Block, 'Designing the nation: the Belgian railway project, 1830–1837', *Technology and Culture*, 52 (2011), 703–32.

in 1864 combined with the urban predominance of Copenhagen led governmental authorities to develop the national railway infrastructure around Copenhagen, resulting in an infrastructural divide between east and west Denmark that persists today.⁵¹ Despite these connections, comparative work on Ireland, Belgium and Denmark remains very limited. There is, remarkably, a complete absence of any comparative work on their urban history.⁵² Hannerz and Gingrich, from an ethnographical perspective, include in their recent volume studies of Denmark and Ireland but not in a comparative perspective.⁵³ Similarly, there are studies of Belgian and Irish cities in Viganò's work on the 'horizontal metropolis', and Hall and Pain's 'polycentric metropolis' volume, but again they are not treated in a comparative manner.⁵⁴ Where these studies exist they tend to be macro-economic analyses of the place of small states in the global economy – for example in John Campbell and John Hall's recent work on Denmark, Ireland and Switzerland in the context of the 2008 financial crisis.⁵⁵ Bringing this trio of small countries into clearer focus with empirical urban histories presents a novel way of better understanding the broader issues of citizenship, welfare and networked infrastructure at the core of this new research agenda.

Infrastructuring the welfare citizen: water, automobility and the networked home

Modern citizenship, of course, has been about more than just legal and political rights. To be a modern citizen also involved belonging to and participating in an infrastructured everyday life as well as adopting certain forms of political subjectivity developed around infrastructural networks. To explore this perspective, we take three cases, exemplifying how urban infrastructures and modern citizenship have intertwined in urban Europe. These comprise water networks, mobility infrastructures and the networked home.

⁵¹S.B. Frandsen, 'Danmark på langs og på tværs', *Temp*, 18 (2019), 12–34.

⁵²This is the case even though comparative and transnational focuses are now relatively well theorized; see for example N. Kenny and R. Madgin (eds.), *Cities beyond Borders: Comparative and Transnational Approaches to Urban History* (Farnham, 2015).

⁵³T. Hylland Eriksen, 'After 22 July 2011: Norwegians together', in Hannerz and Gingrich (eds.), *Small Countries*, 67–82; O. Löfgren, 'The Scandinavian cluster: small countries with big egos', in *ibid.*, 83–104; and H. Wulff, 'Greater than its size: Ireland in literature and life', in *ibid.*, 301–16.

⁵⁴T. Broes, 'The art of horizontal urbanization: the urban questions of engineer August Mennes in the Antwerp agglomeration', 153–60; Dieter Bruggeman, 'Taking care of the residual fraction: the provincial projects for the electrification of Belgium in a perspective of urbanisation', 161–8; and Y. Vanhaelen, 'Centralization, decentralization, and metropolization: cultural attractors in Brussels Metropolitan Area', in Viganò, Cavalieri and Barcellona Corti (eds.), *The Horizontal Metropolis*, 239–46; C. Vandermotten *et al.*, 'Central Belgium: polycentrism in a federal context', in Hall and Pain, *The Polycentric Metropolis*, 146–53; and C. van Egeraat *et al.*, 'Greater Dublin the Celtic Tiger economy: towards a polycentric mega-city region?', in *ibid.*, 187–96.

⁵⁵J.L. Campbell and J.A. Hall, *The Paradox of Vulnerability: States, Nationalism and the Financial Crisis* (Princeton, 2017), 1–6, 27–62, 63–106. See also within this sub-field P. Katzenstein, *Corporatism and Change: Austria, Switzerland and the Politics of Industry* (Ithaca, NY, 1984); and more recently A. Alesina and E. Spolaore, *The Size of Nations* (Cambridge, MA, 2005).

Water

The supply and provision of fresh water were essential for the development of modern cities in nineteenth-century Europe. In various national and urban contexts, municipal procedures entangled with technical and sanitary expert knowledge and increasingly constructed access to unlimited, clean water as a vital precondition for both the operation of businesses and industries and for maintenance of a healthy urban population. Through the construction of comprehensive networks of sewers and pipelines, urban Europe thus gradually became underpinned by a complex set of metabolic processes which, in turn, promoted new ways of living with and using water in everyday life.⁵⁶ The new domestic water technologies accompanying this development, including constant flow, WCs and bathtubs, intertwined with and materialized emerging cultural norms connected to hygiene and sanitation. The ‘civic toilette’ of the late nineteenth century, in this sense, linked the clean body to the healthy and well-functioning city.⁵⁷

Yet in the early twentieth century, access to the everyday technologies of infrastructured water was still reserved to a limited part of the urban population. In Copenhagen, for instance, only 5 per cent of all dwellings were equipped with bathing facilities in 1919, and in 1926 still only 3.8 per cent of the housing stock had access to hot water in the home.⁵⁸ These conditions, however, were to change profoundly as domestic water technologies became recast in the context of the new urban housing policies implemented by Social Democratic governments from the early 1930s onwards.⁵⁹ Thus, in 1944 a governmental committee – the Interior Ministry’s Building Commission – defined the period from 1926 onwards as ‘the era of technical installations’ in urban Denmark.⁶⁰ The committee referred to a development in which modern technological installations for WCs, bathing facilities and hot water as well as gas, electricity and lighting had become standard equipment in the majority of new dwellings. Whereas only 25 per cent of the constructed flats between 1910 and 1915 in Denmark were equipped with such

⁵⁶Joyce, *The Rule of Freedom*; Hillier, ‘Implementation without control’; V. Taylor and F. Trentmann, ‘Liquid politics: water and the politics of everyday life in the modern city’, *Past & Present*, 211 (2011), 199–241; M. Gandy, ‘Rethinking urban metabolism: water, space and the modern city’, *City*, 8 (2004), 363–79; Gandy, *The Fabric of Space*; E. Swyngedouw *et al.*, ‘Urban water: a political-ecology perspective’, *Built Environment*, 28 (2019), 124–37; M. Thelle, ‘Stofskifte under tryk – vandets infrastruktur og rum i København’, *Temp*, 18 (2019), 79–97; M. Kaika, *City of Flows: Modernity, Nature, and the City* (London, 2004); M. Guardia, M. Rosselló and S. Garriga, ‘Barcelona’s water supply, 1867–1967: the transition to a modern system’, *Urban History*, 41 (2014), 415–34; T. Moss, ‘Divided city, divided infrastructures: securing energy and water services in postwar Berlin’, *Journal of Urban History*, 35 (2009), 923–42.

⁵⁷The phrase is Patrick Joyce’s, *Rule of Freedom*, 73–5; see also R. Sennett, *Flesh and Stone: The Body and the City in Western Civilization* (London, 1994), part 3.

⁵⁸Copenhagen Municipality, *Statistisk Aarbog for København, Frederiksberg Og Gjentofte Kommune 1919* (Copenhagen, 1920), 34; Copenhagen Municipality, *Statistisk Aarbog for København, Frederiksberg Og Gjentofte Kommune 1926* (Copenhagen, 1927), 49.

⁵⁹For an overview of the connections between the welfare state and Danish urban and housing policies in the mid-twentieth century, see H. Bro, ‘Velfærdsstaten og boligen’, in T. Knudsen (ed.), *Dansk Forvaltningshistorie II. Stat, forvaltning og samfund. Folkestyrets forvaltning fra 1901–1953* (Copenhagen, 2000), 565–613.

⁶⁰The Interior Ministry’s Building Commission of 1940, *Det Fremtidige Boligbyggeri: Betækning Afgivet af Indenrigsministeriets Byggeudvalg af 1940* (Stuttgart, 1945), 33.

amenities, this applied to 83 per cent of the flats constructed between 1936 and 1940, primarily as non-profit housing.⁶¹ Established in order to make recommendations for the future direction of Danish housing policies, the commission argued that modern technological amenities, especially for water and heating, were vital in ensuring a socially stable and healthy urban population.⁶² In this sense, the work of the committee points not only to the democratization of domestic water technologies but also to how infrastructured water came to work as a disciplinary technology in the context of the emerging welfare society. Devices such as WCs, bathtubs, showers and bidets all facilitated new norms and practices for personal hygiene that quickly became integral to the daily lives and routines of the modern urban citizen.

Urban water networks and technologies were thus intimately entangled with prevalent power rationalities and worked actively in creating new forms of political subjectivity. However, as Vanessa Taylor and Frank Trentmann have demonstrated, water infrastructures functioned not only as disciplinary technologies but also as sites of political contestation and material politics.⁶³ With improved access to water in British cities from the mid-nineteenth century onwards, new senses of entitlement arose among the urban dwellers. This particularly found expression in periods of droughts when water scarcity prompted new types of urban conflicts and political mobilization over the 'right to water'. Water infrastructure, in this sense, expanded the political sphere to new areas of domestic life which meant that being deprived of access to water increasingly meant being denied full access to society. As in the case of Copenhagen, Taylor and Trentmann's study reminds us how the relations between water technologies and notions of citizenship developed over time. While infrastructured citizenship in the late nineteenth century was closely tied to running water, by the 1930s this increasingly applied to bathing facilities in the home as well.⁶⁴ As a barometer of modernity, the 'fixed bath' now represented the frontier of urban well-being and comfort and thereby exposed the shifting boundaries of urban welfare and citizenship.

Automobility

With the establishment of modern water networks, cities became supplied with an infrastructure of pipelines and sewers that ensured the constant flow of water, from fresh water to waste water. Besides showcasing how infrastructures came to underpin various aspects of urban life, the case of urban water suggests the intrinsic relationship between urban infrastructures and notions of flow and mobility. Gradually, and especially during the twentieth century, such notions were expanded from resources to include also the urban dwellers themselves.

The spread of mass urban automobility from the 1950s is a quintessential example of this development. Not only was private car ownership on the rise as an accompaniment of urban life throughout urban Europe, but cities were also

⁶¹*Ibid.*, 33

⁶²*Ibid.*, 31.

⁶³Trentman and Taylor, 'Liquid politics'; Hillier, 'Implementation without control'.

⁶⁴Trentmann and Taylor, 'Liquid politics', 238.

spatially reshaped to facilitate the car-based society through the establishment of new road networks, motorways and parking facilities.⁶⁵ The Radburn planning scheme from the late 1920s is an early example, and in the planning and construction of new towns after World War II the ideal of the car-based society became particularly dominant. As Guy Ortolano has shown, the planning of Milton Keynes in the late 1960s was predicated upon an ideal of universal car ownership.⁶⁶ To live in this new town – a spatial manifestation of the British welfare state – one needed access to this type of mobility. However, it also meant that not owning a car would significantly hinder one's possibilities for participating in society. The rise of urban automobility was closely linked to processes of suburbanization, as the increase in private car ownership and the establishment of new road networks introduced car-based commuting as an everyday practice among many urban dwellers. In Denmark, the planning of road networks intertwined with notions of commuting as a citizen right. As part of the planning of the urban region of Aarhus in the 1960s, the public authorities specifically set out to ensure that all urban citizens gained *equal access* to the amenities of the city. To do so, the planners aimed to reduce the commuting time between home and work as well as various amenities for recreation and consumption to a maximum of 30 minutes each way. Hence, planners envisaged an urban road network that would facilitate these patterns of everyday life and install the welfare citizen as equally mobile across the city.⁶⁷

The spatial principles of the car-based society were – as was the case with urban modernism in general – in retreat from the early 1970s onwards. In the case of Birmingham, a pre-eminently pro-car city in the 1960s, the heavy investments in roads and motorways faced steadily expanding opposition from the 1970s. Citizens without access to cars, most typically women, protested against the ways in which this infrastructure not only favoured the mobility of car owners but also posed a serious threat to the people inhabiting the city as pedestrians.⁶⁸ In this way, infrastructures for mobility also produced new forms of exclusion, helping to recast certain groups in the population as 'constitutive outsiders' to full citizenship – 'second-class citizens' as the phrase went. By not owning a car, such people were excluded from participating in society on full and equal terms. As in the case of water, infrastructure networks such as automobility developed into sites of political contestation, prompting new social norms and debates about what it required to be a modern, urban citizen.

⁶⁵See for example P. Lundin, 'Mediators of modernity: planning experts and the making of the "car-friendly" city in Europe', in Hård and Misa (eds.), *Urban Machinery*, 257–81; S. Gunn, 'People and the car: the expansion of automobility in urban Britain, c. 1955–70', *Social History*, 38 (2013), 220–37; N. Spurling, 'Making space for the car at home: planning, priorities and practices', in Shove and Trentmann (eds.), *Infrastructures in Practice*; G. Ortolano, *Thatcher's Progress: From Social Democracy to Market Liberalism through an English New Town* (Cambridge, 2019).

⁶⁶Ortolano, *Thatcher's Progress*.

⁶⁷M. Høghøj, 'Planning Aarhus as a welfare geography: urban modernism and the shaping of "welfare subjects" in post-war Denmark', *Planning Perspectives*, 35 (2020), 1031–53.

⁶⁸S. Gunn, 'Ring road: Birmingham and the collapse of the motor city ideal in 1970s Britain', *Historical Journal*, 61 (2018), 227–48.

The networked home

As the case of water demonstrated, even the most intimate spheres of everyday life in twentieth-century urban Europe became infrastructured. The so-called 'era of technical installations' heralded the emergence of the 'networked home', which became a widespread marker of welfare modernism in the 1950s. As a node assembling infrastructures, the networked home was predicated upon unlimited access to water, heating, electricity and communications and thus the democratization of infrastructural goods.

In particular, the democratization of heating systems exhibited shifting causalities between infrastructural networks and conceptions of citizenship. With the implementation of district heating in Danish welfare housing, a new culture of physical well-being gradually emerged. Historians Ning de Coninck-Smith and Mogens Rüdiger have termed this culture the '21 degrees culture', since it relied upon universal access to a certain heating standard through the simple adjustment of domestic radiators and heating devices. This standard, they argue, gradually developed into an informal right and represents how the welfare state very tangibly translated into everyday life.⁶⁹ In other words, one's access to certain infrastructural goods, in this case electricity and district heating, became instrumental for participation in Denmark's modern welfare society.

The establishment and democratization of the networked home effectively plugged millions of urban Europeans into intricate networks of communication, energy, water and waste removal in the post-war decades. From one perspective, the networks exhibit how the built environment of cities actively distributed infrastructural services to the general population and thus worked as channels through which everyday welfare became installed in post-war European societies. However, over time, these technologies could also develop into sites of everyday material politics and thus encompass broader shifts between urban infrastructure, power and notions of entitlement. Whereas Danish '21 degrees culture' relied upon flexible devices allowing people to control and regulate the heat that entered their home individually, the installation of district heating on several British mass housing estates rarely granted the residents the same freedom.⁷⁰ As Sam Wetherell has shown, the collective logic of such heating systems became particularly contested during the liberalization of the British housing market in the 1980s. Many of the new homeowners, who had purchased their flats under the 'right to buy', now demanded the right to control the heat of their home individually and thus to disconnect their flats from the common boilers of the estate.⁷¹ In other words, while the Conservative government strove to liberalize the housing market, the built environment of council estates resisted this development.

Charlotte Johnson has identified similar dynamics in her account of heating policies in Belgrade during and after the Cold War. In the 1960s, the socialist municipality's power materialized in a district heating system with vertical pipes and no

⁶⁹N. de Coninck-Smith and M. Rüdiger, 'Typehus, energi og familieliv i 1950'erne og 1960'erne', in N. Finn Christiansen *et al.*, *Ole Lange – fra kætter til koryfæ* (Copenhagen, 2007).

⁷⁰S. Wetherell, *Foundations: How the Built Environment Made Twentieth-Century Britain* (Princeton, NJ, 2020), 91.

⁷¹*Ibid.*, 110–12.

individual regulation. The system functioned both as a provider of heat and as a delineator of social power, distributing this service unequally to favoured groups and districts. However, even those favoured with heat could get too much, adding thermostatic valves to control their own apartments. Later, becoming privatized, the flexible heating system re-emerged as a low-carbon solution, but the valves installed during the socialist period now affected the sale or rental value of each apartment.⁷² Shifting political alignments had to be reconciled here with the path dependency produced by technology and infrastructure. As with British council estates, politics were wired into the urban fabric of Belgrade so that 'regime change' involved much more than merely changes in governance or ideology.

Concluding reflections

As the cases of water, automobility and the networked home suggest, urban infrastructures and citizenship have been mutually constitutive on multiple scales, from the intimate spaces of the home to the overarching supply systems connecting cities to their hinterlands and each other. Furthermore, conceptualizing infrastructure as an intermediary underpinning both welfare politics and the performance of citizenship enables the urban to be reimagined in several ways. It can open up new approaches to urban governance, political subjectivity, urban identity and social in/exclusion. As Ash Amin showed in his seminal piece 'Lively infrastructure', approaching the city and urban governance as an infrastructural 'provisioning machine' demonstrates how the social and the technological are co-produced. First, technological systems provide access to urban society, or deny provision, foregrounding relations between material connectivity and selective membership of the urban community. Secondly, the symbolic power of infrastructure showcases social selectiveness in both its aesthetics and workings, playing a crucial role in political subjectivity. And thirdly, infrastructure plays a vital role in the everyday experience of the city and the construction of social identities.⁷³ Put differently, in the making, unmaking, absence or failure of connections, infrastructure works as mediator of citizen rights, extending forms of provision to the everyday lives of urban dwellers. In doing so, infrastructures often work as disciplinary channels promoting certain forms of behaviour and modes of political subjectivity through the built environment. Conversely, infrastructural performativity also facilitates insurgency and can serve as a battleground for the negotiation or struggle for new citizens' positions and informal rights. As access to water, heating, communications and transport have always been unevenly distributed, infrastructures have become platforms for various urban groups and communities claiming inclusion and belonging to the realm of urban citizenship.

We have argued here that urban infrastructures offer a privileged site for analysing the manifold and sometimes contrasting ways in which modern citizenship has been produced, negotiated, contested and enacted through the built environment of cities. It does so in ways that allow us to connect the urban material fabric with the

⁷²C. Johnson, 'District heating in Belgrade: the politics of provision', in Shove and Trentmann (eds.), *Infrastructures in Practice*, 102–14.

⁷³A. Amin, 'Lively infrastructure', *Theory, Culture & Society*, 31 (2014), 137–61.

realm of everyday life, thus proposing novel approaches to studying social identities and power dynamics. It opens a window into how citizenship was conceived, negotiated and performed in the concrete encounters between the material systems of cities and the everyday practices and needs of the urban dwellers. As several scholars have already emphasized, the production of citizenship does not simply concern the legal status of individuals and social groups, but it is deeply embedded in the practices through which such groups engage with and claim their position as citizens through various acts and modes of performativity.⁷⁴ As Charlotte Lemanski has recently argued in proposing the concept of ‘infrastructural citizenship’, we need further studies dealing with specific ways in which such citizenship acts and practices have formed and been formed by infrastructures in different urban contexts.⁷⁵ For urban history, this will require further attention to how urban dwellers and communities have entered into processes and dynamics of power through their engagements with the infrastructures constituting, or absent in, their everyday material fabric. Thinking ahead, such an attention can potentially grow from further exchanges with different fields of study including materiality, mobility, governance and gender studies, all providing a critical edge to questions of urban agency, participation and subjectivity.⁷⁶ By addressing the various ways in which the urban dweller became ‘infrastructured’ and how this, in turn, promoted modes of political subjectivity and of inclusion and exclusion that lay at the heart of modern citizenship, we can advance this research agenda and, in Tom Hulme’s felicitous phrase, ‘put the city back into citizenship’.⁷⁷

⁷⁴J. Holston, *Insurgent Citizenship: Disjunctions of Democracy and Modernity in Brazil* (Princeton, 2008); E.F. Isin and G.M. Nielsen, *Acts of Citizenship* (London, 2008); S. Graham and C. McFarlane, *Infrastructural Lives: Urban Infrastructure in Context* (Abingdon, 2014); A. Amin and N. Thrift, *Seeing like a City* (Cambridge, 2017)

⁷⁵C. Lemanski, ‘Infrastructural citizenship: spaces of living in Cape Town, South Africa’, in C. Lemanski (ed.), *Citizenship and Infrastructure: Practices and Identities of Citizens and the State* (Abingdon, 2019), 8–22.

⁷⁶K. Cowman et al. (eds.), *Gender in Urban Europe: Sites of Political Activity and Citizenship, 1750–1900* (New York, 2014); M. Prak, *Citizens without Nations: Urban Citizenship in Europe and the World, c. 1000–1789* (Cambridge, 2018), A. Barry, *Material Politics: Disputes along the Pipeline* (Chichester, 2013), ch. 7.

⁷⁷Hulme, ‘Putting the city back into citizenship’.