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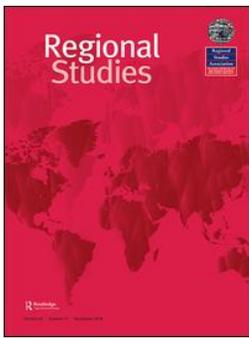
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Regional infrastructures, infrastructural regionalism

Michael R. Glass^a , Jean-Paul D. Addie^b  and Jen Nelles^c 

ABSTRACT

An 'infrastructure turn' across the social and policy sciences is generating a new wave of interdisciplinary enquiry into how infrastructure is shaping urban and regional space. This editorial introduces a virtual special issue that charts the evolution of infrastructure as an empirical and conceptual concern within *Regional Studies*. The issue demonstrates that analysing regions through infrastructure – whether large, capital-intensive projects or more mundane infrastructures – provides a novel and necessary perspective on the regional question.

KEYWORDS

regionalism; infrastructure; *Regional Studies*

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An 'infrastructure turn' across the social and policy sciences is generating a new wave of interdisciplinary enquiry into how the functions and impacts of infrastructure are shaping urban and regional space.¹ This renewed prominence is reflected in crude publication count metrics – Web of Science, for example, shows a 40-fold increase of articles on infrastructure and regions in the past 20 years, and 3.5 times more articles in 2018 than in 2009 (2677 versus 764). A deeper reading of these articles clearly evinces a qualitative transition from technocratic engineering and economic feasibility studies towards an expansive engagement that foregrounds the social, environmental and political dimensions of the networks undergirding contemporary life. Infrastructure has long been a core (if often implicit) concern of regional studies: regardless of the region in question, infrastructural systems play a foundational role in structuring urban and regional development in material and symbolic terms. The provocations, challenges and possibilities of the present infrastructure moment give cause to reappraise the research trajectories undertaken at the intersection of regions and infrastructure in *Regional Studies*. Reviewing key points of engagement with infrastructural questions across 50-plus years of scholarship in the field's flagship journal reveals both major conceptual and policy interventions, and areas of opportunity for future research. The potential for regional perspectives to contribute to the burgeoning literature emanating from the infrastructural turn is clear, as is the capacity for an infrastructural lens to

shape new empirical and analytical lines of investigation in regional studies and cognate disciplines.

This editorial introduces a collection of papers that charts the evolution of infrastructure as an empirical and conceptual concern within *Regional Studies*. Representing infrastructural debates over the journal's history presents immediate challenges regarding selection and omission. We approached this task through a two-fold strategy that, first, intends to convey a sense of the predominant topical, geographical and methodological approaches to infrastructure issues adopted by regional researchers. The virtual special issue is, therefore, structured through a broad periodization that captures distinct epochs reflective of changing academic interests and social moments. We contextualize explicitly infrastructure-focused papers in relation to agenda-setting articles by Massey (1979), Markusen (1999) and Allen and Cochrane (2007) to capture essential debates and theoretical innovations formulated within *Regional Studies*, and to situate infrastructure's role in informing the intellectual zeitgeist of the field.

Second, beyond a simple retrospective, we suggest the papers included here warrant re-reading and re-evaluation in relation to the current infrastructural turn. The juxtaposition of methodologies and modes of analysis throw continuities and ruptures into stark contrast. Consequently, this collection has the potential to inform future academic research on the diverse and global landscape of infrastructural regionalisms. We intend this virtual special issue to

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demonstrate that analysing regions through infrastructure provides a novel perspective on the regional question. From large capital-intensive projects – new rail lines, tunnels and dams – that hold the public imagination to the banal day-to-day operation and maintenance of essential infrastructure systems, investment and disinvestment in infrastructure reveals the vital discursive and material elements through which regions worldwide are produced, structured and struggled over.

THE PAPERS: PERSISTENT THEMES, EMERGING CONCEPTS

Quantitative cases and the economic impacts of infrastructure

Work published in the 1960s and 1970s reflected the UK-based nature of the journal and the positivist inclination of scholarship during the period. Papers by Ridley and Tresider (1970), Gwilliam (1970), Dodgson (1974) and Peaker (1976), for instance, present quantitative case studies of transportation infrastructure networks to evaluate regional economic impacts arising from investment patterns. Papers such as these provided methodologies and analysis that would benefit both academic and policy audiences, and yet were also symptomatic of Massey's (1979) critique of quantitative papers that ignored the deeper structural dimensions and capitalist imperatives of location decisions and geographical patterns of uneven development. By the 1980s, Massey's critique and new interest in larger patterns of deindustrialization, disinvestment and technological innovation had affected the way infrastructure was conceived of within *Regional Studies*. Langdale (1983), on the US long-distance telecommunications industry, for example, reflected the changes compelled by Ronald Reagan-era deregulation and the rise of new infrastructural systems. Case studies of the economic impacts of infrastructure continued to feature periodically: Looney and Frederiksen (1981) examined the impact of gross domestic product (GDP) in Mexico's regions that arose from investment in infrastructure, while Starkie (1979), Simon (1987) and Whitelegg (1987) each evaluated UK-based regional development effects of transportation infrastructure. By the late 1980s, the development of the European Economic Community (EEC) and plans for infrastructural links between the UK and Europe were beginning to generate new lines of research that pushed beyond concerns with the multiplier effects of specific investments.

Sir Alan Wilson argued for the relevance of research for regional planning (Wilson, 1969). Written at a point when he was transitioning from a career in theoretical physics to one in urban geography, the paper argues for planning research that looks to create theoretically grounded models of city-region form and function. The paper presents a conceptual structure that researchers could use to evaluate regional planning: population structures and activities, intra-urban communication and structure, and economic activities and land uses are flagged for investigation. Wilson emphasizes the significance of infrastructure to regional

form and function: physical infrastructure such as residential and commercial buildings, public and social services, and public utilities are granted a central function to how regions operate, although these are only defined according to the economic structure of regions.

Adeniyi (1976) provides an economic and social analysis of Nigeria's Kainji Dam project, and the influence of this infrastructure on regional and national development. The case study is notable for representing the high-modernist ideal of national economic development objectives addressed through infrastructure. The Kainji Dam was commissioned in 1969 as the centrepiece of federal government plans to provide electricity for the country. Located on the Niger River in western Nigeria, the dam resulted in the inundation of 203 villages, 35,780 acres of farmland and the resettlement of approximately 44,000 people. Adeniyi's analysis describes disruptions to social and environmental systems caused by the dam, and the comprehensive regional planning that was enabled by the creation of a new regional structure because of the dam and a new electricity grid.

Vickerman (1987) represents a common mode of infrastructural research in *Regional Studies*: the economic development consequences of a proposed or actual investment in physical infrastructure. In this instance, the paper evaluates the future impact of the Channel Tunnel on economic development in both England and France using a shift-share analysis. Vickerman predicted that (although overall impacts would be marginal) the Calais region would receive the greatest short-term effects, whereas the greatest longer term impacts would accrue to Kent. The paper is notably apolitical and assumes static and neutral regional constructs in comparison with more recent scholarship informed by debates over regional territoriality/relationality and the politics of infrastructure.

Infrastructure, governance and regional recalibration

Into the 1990s, *Regional Studies* began to feature more papers assessing the regional development impacts of infrastructure in different European regions, including those by Cutanda and Paricio (1994) and Mas, Maudos, Pérez, and Uriel (1996) in Spain, and Johansson and Karlsson (1994) in Sweden. In general, infrastructure remained a background topic that did not significantly contribute to conceptual advances in the field. The few papers that addressed issues of infrastructure and regions were firmly anchored in, and spoke to, narratives of neo-liberalism, globalization and the emerging popularity of the regional scale as the appropriate territorial fix to the much-sought-after goals of innovation and growth (see Markusen, 1999, on this phenomenon). This point is emphasized by Guy, Graham, and Marvin (1996), who observe:

As the national state and individual local authorities seem less able to resolve complex economic, environmental and social issues, the region is increasingly being viewed as the optimum level at which public and private sector interests can be

brought together to maximize positive development within a Europeanizing space economy.

(p. 732)

On the one hand, this presented an opportunity to situate infrastructural questions at the heart of emerging debates on new regional spaces centred around flexible specialization, world cities and learning regions. On the other, Markusen (1999) pointed to what she viewed as a problematic conceptual and methodological fuzziness inherent in many of these theoretical innovations. Expansive approaches to defining regions and analysing regionalization opened productive ways in which to grapple with pervasive forms of urban restructuring but also, in Markusen's view, risked undermining regional studies' analytical rigour, and with this, the field's established strengths in political and policy advocacy. Publications in this period reflected the struggle of policy-makers and academics to come to terms with governance fragmentation, with lags (or lapses) in the rescaling of power relative to the intensifying recalibration of economic policy towards the regional scale, and with how to respond to the consequences of evolving supranational regional entities.

Roberts' (1993) analysis of managing regional strategic planning in the UK only discusses infrastructure explicitly in passing. However, the author draws lessons from the European context to support a call for the UK to renew its focus on strategic planning – for infrastructure and other policy areas – at the regional scale. The paper outlines and laments the paucity of British strategic planning, tracing its rise in the 1950s and fall in the 1970s. Consistent with the themes of this era, Roberts notes that

like it or not, regions find themselves in a position whereby they are in competition for internationally mobile capital and they need to ensure the provision of quality infrastructure and living environments if they wish to attract or retain economic activities.

(p. 759)

In this context, the paper argues for a return to a mode of regional strategic planning that is sensitive to the challenges of governance fragmentation and links up planning and implementation at the appropriate spatial scale.

Johansson and Karlsson (1994) make a more explicit link between regional infrastructure and governance by assessing the infrastructure assets of the Mälars region of Sweden to understand how development policy can enhance regional competitiveness. They argue that infrastructure networks are instrumental to both economic growth and resilience. One conclusion that remains valid is that while infrastructure networks are useful to all businesses, they have different payoffs and impacts across industries. This hints at the contested nature of infrastructure development even among communities whose interests relate to adapting to globalization.

The implication of neoliberalism's rollout for infrastructure includes a scholarly call for increased attention to the governance of regional infrastructure, and a practical reworking of the mix of actors involved in those governance

processes. Guy et al. (1996) echo Roberts' argument for increased attention to regional strategic management in the UK and note some progress in encouraging interdepartmental planning at the regional scale. The authors observe that the role and influence of regionally based utility companies was conspicuously absent during the early 1990s. This paper is among the first contributions that team made to developing an ongoing research agenda around splintering urbanism and on the role of intermediary organizations in shaping urban infrastructures.

Overall, papers from this era reflect the period's dominant debates and themes – situating the region and elaborating its power structures more so than developing an understanding of how and why regional governance occurs. Later scholarship on state rescaling, regional identity, policy transfer and variegated regional worlds built upon work of the 1990s. Yet, as regional research expanded beyond traditional concerns with quantitative studies of regional economic impact, it increasingly questioned many of the assumptions and observations that these papers introduced. This led toward more critical approaches to the role and significance of regional infrastructure, and the mechanisms of its development. Into the 21st century, the infrastructure turn would take hold in *Regional Studies* through papers that adopted a more intentional approach toward understanding how infrastructure and regional space are mutually constitutive.

Infrastructure, competitiveness and the relational region

If Markusen's (1999) response to the perceived 'fuzziness' of regional thinking was to advocate for the identification of essential analytical objects and a stable language for theory construction, Allen and Cochrane (2007) embraced new relational ontologies of flow, connectivity and territorial porosity. Through an exploration of the diffuse forms of governance emerging across the South East of England in the early 2000s, they offered a topological reading of the region as 'made and remade by political processes that stretch beyond it and impact unevenly' (p. 1172). Their notion of *regional assemblages* challenged regions as territorially fixed and nested container spaces and located political power in the practices pursued through fragmented constellations of state authority, business and other agencies. The infrastructural moment of their argument is pointed: the South East's extended regional formations (governmental, economic, cultural) are premised on significant state intervention intended to deliver large-scale infrastructure for growth. Yet, beyond the territorial interests of the state, regional assemblage provides a vital relational lens through which to explore how multiple local and translocal interests are negotiated and situated within the unevenness of regional space, with its infrastructural hotspots and holes.

Goodchild and Hickman's (2006) Policy Debate on 'The Northern Way' – a supra-regional planning initiative launched in the North of England in 2004 – offers a grounded illustration of the tensions that arise when networked forms of competitive regionalism push against the territoriality of regional government. Major infrastructure initiatives, particularly geared towards improving east–

west transport between Manchester and Leeds, were at the crux of The Northern Way – justified by a post-political discourse forwarding the pursuit of economic growth as a normative good (p. 126). Crucially, while appeals to new infrastructure investments have the capacity to integrate new regional spaces in the minds of interest groups, the authors gesture towards persistent questioning of the evidence for linking regional centres, the initiative's financial logics and the political acceptability of rescaled spatial planning. What emerges in practice is not so much a tale detailing the rise of a new regional vision, but a contested and complex over-layering of multiple regions whose infrastructural coherence hinges on sustained commitment from upper levels of government.

Coyle and Sensier (2019) revisit the problematic of infrastructure investment and regional economic performance through a critical assessment of the UK Treasury's project appraisal methodology. In contrast to the bright regional vision proffered by The Northern Way, the authors argue the process for appraising infrastructure projects in the UK serves to entrench regional inequalities in favor of London. Officials' 'strong cultural resistance' to intervening actively in the spatial development of the economy (p. 10) and an adherence to a partial mode of cost-benefit analysis belies how public policy reproduces uneven geographical development at the national scale. In response, they call for a more strategic approach to infrastructure decision-making that can reallocate public investment to spur regional economic performance outside the South East.

Jonas, While, and Gibbs (2010) address non-hierarchical governance, infrastructure management and competitive city-regional development in new economic spaces in Greater Boston (USA) and Cambridge (UK). The authors' conceptual framework refocuses attention from conventional supply-side infrastructure narratives towards a demand-side concern with a 'new territorial politics of collective provision'. Across mature and emerging high-technology spaces, Jonas et al. observe infrastructure amenities tending to serve the interests of local capitals operating in global markets and networks. They present a rejoinder to the scant policy and analytical attention paid to the social reproduction requirements of other agents: local states, social movements, low-skilled labour, the precariously employed and housed. In doing so, they move beyond analysing regional infrastructure as the premium conduits for competitive states to interrogate city-regional infrastructure as a setting and stake of social struggle over which new collective politics of provision may be animated.

Expanded horizons, global perspectives

Broadening conceptual, geographical and political concerns currently characterize the intersection of infrastructure and regional studies. Schafran (2014) engages infrastructure as a means to examine the imagined geographies and practical politics of mega-regions. Focusing on northern California, he argues that the potential of the mega-region as a political space lies not in its elevation as a scale of governance but as a critical context through which 'tactical sub-regionalism' can be operationalized. While mega-regional thinking is

perhaps necessary regarding large-scale infrastructure systems, the paper contends key distinctions need to be made when considering scales of analysis and scales of political intervention. Schafran draws two important conclusions. First, the starkest manifestations of the northern California mega-region are not found in its massive territorial extent or urban centres, but in the infrastructure corridors and ex-urban spaces that bind multiple regions together. Second, echoing Jonas et al. (2010), infrastructure provides a vital concrete area of concern around which *feasible* politics at the mega-regional scale can be tactically mobilized in practice.

Chen and Vickerman (2017) examine how transport infrastructure impacts the economic structure of city-regions through a nuanced comparative analysis of high-speed rail in the Yangtze River Delta (China) and Kent (UK). Their results suggest that high-speed rail tends to strengthen the economic position of cities served by advanced transport (notably regarding the knowledge economy), but note that its impacts vary in differing spatial contexts, national governance regimes and economic trajectories. The authors found that high-speed rail is associated with specialization and economic divergence when introduced at an earlier stage of development, but is likely to foster economic convergence when introduced into more advanced economies.

The idea that infrastructure interventions reflect and actively remake regional geographies is a central theme in Webber, Crow-Miller, and Rogers's (2017) critique of China's South-North Water Transfer Project (SNWTP). Contra to how the project is represented by the state – as an apolitical, technocratic response to regional imbalances in water supply and demand – the authors' case study operates at several scales to disclose the project's environmental, economic and governance implications: from macro-political concerns with resource allocation and pricing to the day-to-day logistical challenges of water management. The authors' technopolitical interpretation effectively unblack-boxes how huge infrastructure projects such as the SNWTP create 'both the need for and a space within which the horizontal and hierarchical distribution of power in China can be remade' (p. 377).

Wiig and Silver (2019) provide a fitting conclusion to this virtual special issue and an evocative departure point for future research at the intersection of infrastructure and regional studies. Their analysis positions the deployment of global infrastructure at the centre of a research agenda to examine urbanization in uncertain geopolitical times. The paper begins by surveying some of the deep urban transformations engendered from London (UK) to Kampala (Malaysia) by China's Belt and Road Initiative (BRI). While noting that processes of standardization (of rail track gauge, monitoring systems, border checks and visa regimes) have been vital to the rollout of the technological networks underpinning contemporary capitalism, the authors demonstrate global infrastructures necessarily involve the complex layering of multiple networks in place. To move beyond a narrow focus on standardization, they introduce four analytical moments – speculation, delineation, alignment and pivoting – to draw attention to the contested, unforeseen, incomplete

and variegated ways in which global infrastructures are developed and how they are remaking the territorial and technological geographies of global capitalism.

Building toward infrastructural regionalism

As we face a turbulent present and uncertain future, the papers collected in this virtual special issue demonstrate that the materiality, functioning and symbolic roles of infrastructure will continue to occupy a (contested) position at the heart of our emergent urban condition and regional worlds. Building on *Regional Studies*' tradition of infrastructure research and addressing the imperatives of the current infrastructure turn foregrounds the problematic of *how infrastructure constructs regions*. This question is both fundamental and complex. Regional scholarship must work to overcome what we consider a lacuna in regional research, namely, the lack of a versatile comparative theory of regional infrastructures that reveals the new spatial imaginaries and political subjectivities that infrastructure can conjure. Such a theory would likely have four dimensions. First, research on infrastructural regionalism should be interdisciplinary to develop and leverage new tools to enable cross-sectoral policy learning. Second, this research should prioritize the instances where the formal and informal governance of infrastructure collides to create new regional 'spaces'. The structures that emerge from planned and organic coalitions raise considerable questions about the complexities that can undermine or empower regional partnerships, hence enabling more longitudinal engagements with infrastructure than earlier research in this journal has provided. Third, we call for research that unpacks the multiple vantage points opened by diverse regionalisms. What techniques and political modalities are required to find coherence within the 'fuzziness' of regional space, and how can we 'see regionally' through infrastructure as a central lens. Finally, we call for more attention to be paid to the regional lives of infrastructure. Infrastructure reveals how regions are experienced differently by diverse social groups: by dispelling any vestigial notions of infrastructure as a set of technocratic and neutral networks, we may move toward regional research that provides the basis for both economic development and social equity.

NOTE

1. This virtual special issue can be accessed at <https://think.taylorandfrancis.com/cres-regional-infrastructures-infrastructural-regionalism/>. It coincides with the launch of the RSA Research Network on Infrastructural Regionalisms (NOIR) in September 2019. For more information on NOIR, including opportunities to engage with and interact in the network, see Twitter @NOIR_RSA. The guest editors thank the editors of *Regional Studies* for their support throughout the development of this virtual special issue.

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