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Editorial: The digital revolution, cities, and urban economies

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Editorial on the Research Topic

The digital revolution, cities, and urban economies

Technological transformation of the fourth Industrial Revolution is radically recalibrating the contemporary city (Boland et al., 2025; Webb and Potts, 2025). It has transformed the way humans live, work, and communicate through advanced technology and access to masses of data and information. Smart technologies—such as Artificial Intelligence, Machine Learning, the Internet of Things, algorithmic governance, cloud computing, big data analytics, and portable technologies—have fundamentally restructured how society functions (Kitchin, 2014, 2017) and, for this Research Topic, the fundamentals of how we plan, design and experience the contemporary city. Such transformative change raises important economic, environmental, and ethical questions concerning how humans inhabit place and specifically the impact of these technological transformations on different demographics. Indeed, there are concerns over democratic deficits and digital divides (Boland et al., 2022). Equally important for this Research Topic, the digital turn and adoption of smart technologies are dictating the organization and operationalization of planning processes (Milz and Gervich, 2021; Potts, 2020; Wilson and Tewdwr-Jones, 2022).

In this Research Topic we present four articles. Zhunisova et al. analyze environmentalism and the digital turn and, in so doing, they argue that climate change poses significant risks to the resilience of Internet of Things (IoT) infrastructure. Focusing on Kazakhstan, Central Asia where regions experience extreme and variable climates, they note that although IoT technologies are widely used across sectors, there is limited academic attention on how such devices perform under climate change. Drawing upon an online survey covering public and private sector organizations the authors reveal that sensors, SIM cards, and outdoor routers are the most operationally critical; in contrast, outdoor routers and actuators showed relatively higher resilience. Notably, over 50% of respondents reported moderate climate change risk to operations, but a substantial information gap remains, with many organizations lacking vendor-provided data for extreme conditions. This lack of transparency limits informed procurement, risk assessment, and resilience planning. The study presents one of the first regional assessments linking IoT operational risks to climate variability in Central Asia and provides recommendations for integrating resilience into procurement standards, and the development of sector-specific adaptation strategies.

Han et al. analyze the digital divide and ‘digital dividend’ in China’s digital economy. Using various statistical methods to measure the digital economy in China’s regions, city clusters, and cities from 2011 to 2019, the findings indicate that the digital economy has continuously improved. Additionally, the spatial differences of the digital economy in the four regions and nine city clusters are decreasing, which indicates that the digital divide is narrowing and represents a significant digital dividend. The study analyzes the spatial differences in the digital economy of cities in China and highlights the convergence at different spatial scales. The findings provide the foundation for the evolution of the digital economy in Chinese cities and offer policy implications for promoting a regionally coordinated digital economy.

Wu et al. analyze the Chengdu Plain, in Sichuan, China, where the ‘shocks and stresses’ of ‘rapid administrative-economic urbanization’ are testing the resilience of agrarian environments. They focus on information and communications technology (ICT) governance tools, such as grid management, and explain how they offer opportunities to sustain and scale up data to validate and refine indicators of landscape resilience, and use them to regulate development, in accordance with UN SDG 11. Drawing upon their evidence, they argue that ICT-based governance—in combination with traditional place-based knowledge—can play an important role in ensuring landscape resilience. One key finding is that ICT-enabled governance needs to incorporate greater transparency and more local feedback loops and enable greater participation from older farmers and women, to inform household and community-level land-use choices and initiatives.

Mualam addresses the debates on how major digital shifts and the increased use of ICT have significantly impacted planning processes. Noting the increased use of digitalization of planning committees, meetings etc. during the COVID pandemic, the author notes that while digital technologies are to be welcomed, it is also important to pay attention to the ‘regressive impacts’, in particular, the ‘severely affected’ social inclusion in planning processes. Focusing on the Israeli planning system post-COVID, which continues to embrace videoconferencing as a tool in planning, the findings show that the ongoing ‘vulnerability of certain groups’. The author notes that despite planners being aware of these outcomes and the adaptations made to existing means of e-participation, it is

clear that online planning meetings are ‘not geared towards’ using tools and platforms to improve practice; instead, the reality is that remote participation remains largely a ‘pro-developers’ process that can marginalize other participants.

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PB: Writing – review & editing. RP: Writing – review & editing. JM: Writing – review & editing.

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References

- Boland, P., Durrant, A., McHenry, J., McKay, S., and Wilson, A. (2022). A “planning revolution” or an “attack on planning”: democratisation, digitisation and digitalization. *Int. Plan. Stud.* 27, 155–172. doi: 10.1080/13563475.2021.1979942
- Boland, P., McHenry, J., Potts, R., and Milz, D. (2025). Professional planners’ preparedness for digital transformation: an empirical analysis of PlanTech. *Town Plan. Rev.* 96, 201–227. doi: 10.3828/tpr.2024.48
- Kitchin, R. (2014). The real-time city? Big data and smart urbanism. *Geojournal* 79, 1–14. doi: 10.1007/s10708-013-9516-8
- Kitchin, R. (2017). Thinking critically about and researching algorithms. *Inform. Commun. Soc.* 20, 14–29. doi: 10.1080/1369118X.2016.1154087
- Milz, D., and Gervich, C. (2021). Participation and the pandemic: how planners are keeping democracy alive, online. *Town Plan. Rev.* 92, 335–341. doi: 10.3828/tpr.2020.81
- Potts, R. (2020). Is a new Planning 3.0 paradigm emerging? Exploring the relationship between digital technologies and planning theory and practice. *Plan. Theor. Pract.* 21, 272–289. doi: 10.1080/14649357.2020.1748699
- Webb, B., and Potts, R. (2025). Are planners ready for a digital transformation? An exploration of digital planning tools and urban planners’ confidence using ICTs. *Int. Plan. Stud.* 1–24. doi: 10.1080/13563475.2025.2550966
- Wilson, A., and Tewdwr-Jones, M. (2022). COVID-19 and the rise of digital planning: fast and slow adoption of a digital planning system. *Town Plan. Rev.* 93, 495–518. doi: 10.3828/tpr.2022.3