

## C-MUS Theme - Digital Twins for Mobility

Urban Digital Twins (UDTs), "digital representations at a set fidelity, of physical element(s) including its behaviour, which is connected and integrated for efficiency"<sup>1</sup>, are the next iteration of smart city developments.<sup>2</sup> Applied to Mobilities, digital twins are an embryonic area which offers an assembly of sensors, models, near-real-time data and analytical capabilities organised and designed for transport, 'staged from above' and is an important research turn.<sup>3</sup> Digital Twins for Mobility as a theme is seen as highly desirable, but what territories should they cover? What data should be assembled? How are these systems structured and decision-making derived? How should digital twins for mobility be organised for sustainability and related to citizen engagement?

The developmental aspects of urban digital twins are controversies as they have concentrated on global cities purporting to offer a range of efficiencies in planning and mobilities amongst other sectors.<sup>4</sup> However, there has been limited consideration of the technological aspects of UDTs for other spatially significant regions and territories. This raises the question of whether UDTs applied to global cities are a misdirection of application and, as a 'matter of concern', whether they could result in a repeat of the earlier failures of first-generation ICT-centric smart cities.<sup>5</sup>

In the context of mobility, Digital Twins are being explored to understand the agency, territory and experimentation of emerging ecosystems with regard to data, access, standards, and emergent use cases such as transport planning, MaaS, wayfinding, urban air space, and drones, among other areas. In addition, there are questions about the performance of cities that do not have such digital ecosystems or investments. For example, digital twins for mobility may offer an ecosystem for the governance of air quality and transport modes addressing sustainability. This theme accepts papers covering the implications of Digital Twins for Mobility, including controversies, as these systems have the potential to escalate spatial injustice and affect climate responsiveness and the ability to predict futures.

### References

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<sup>1</sup> Cureton, (2024) forthcoming.

<sup>2</sup> DT Report, Markets & Markets, SE5540, June, 2022. <https://www.marketsandmarkets.com/Market-Reports/digital-twin-market-225269522.html>

<sup>3</sup> Jensen, 2013.

<sup>4</sup> WEF, 2022.

<sup>5</sup> Angelidou, 2018, van der Aalst et al., 2021, van der Valk et al., 2021.