

# Fostering Sustainable Futures: Digital Twins for Small Towns and Regions

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## Keywords

smart sustainable cities, digital twins, decision-making, small cities and towns

## 1. The SCiNDTiLA Project

The project “Smart Cities and Digital Twins in Lower Austria” (SCiNDTiLA) seeks to improve the understanding of the digital interaction between smart sustainable solutions and the inhabitants of a city through simulations based on digital twins. To this day, smart city concepts have mainly been implemented in the context of large urban environments. In contrast, SCiNDTiLA seeks to complement this research by adapting such approaches to small town and (urban-)rural regional sprawl contexts. The project focuses on the use of digital twins for policy-making and sustainable local governance. It is applied in the context of Lower Austria, which is characterised by the growing number of policy initiatives that have been developed to support “digitalisation of the public sector” and, in particular, so-called “smart initiatives” at both the regional and local level.

## 2. Workshop Topic: Smart Sustainable Cities and Digital Twins

Smart city solutions require innovative governance approaches together with the smart use of technologies by city managers and policymakers to cope with so-called “wicked problems”. Smart sustainable cities (SSC) characterise the application of digital technology and innovative solutions to address the needs of their populations and pursue sustainable socio-economic development [1]. Digital twins, which are virtual replicas of physical systems or processes, represent a key technological approach employed within such SSC frameworks. Originally used in the manufacturing and industrial sectors, digital twins are still in a very early stage of usage for smart city applications [2]. Smart city digital twins (SCDT) are most commonly used in the planning, design and development of a city, in its core policy agenda, and for both short-term and long-term planning [3, 4]. Weil et al. [4] highlight the importance of cooperation between decision-makers for the SCDT to become a useful tool – data-sharing, joint planning, political support and continuous dialogue are needed. As digital twins can store and process more historical and real-time data, they become capable of predicting and forecasting variations and visualising what-if scenarios that can help city decision-makers make proactive decisions (such as for disaster prevention). The digital transition towards SCDT involves properly relating societal values and scientific knowledge, representing the essence of transdisciplinary processes.

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## Workshop Program

Given the limited research on transferring SSC concepts to small urban and rural towns thus far, this transdisciplinary workshop aims to: (1) understand the concept of SSC and the role of digital twins in their development – especially to support decision and policy making; (2) discuss what the elements comprised in SSC systems that can be transferred to smaller-scale urban and non-urban contexts are; and (3) discuss how digital twins can support policy-making in smaller-scale urban and non-urban contexts focusing on specific use cases.

Since a transdisciplinary approach is key to a successful development of SCiNDTiLA, this workshop seeks to involve researchers and practitioners from different disciplines and promote the active discussion on the topic towards the development of a theoretical framework of SCDT.

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