

Leveraging Digital Twins for Energy-Efficient and Liveable Cities

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SUMMARY

Creating a digital twin for cities of all sizes offers numerous benefits, particularly in making urban areas more energy-efficient and liveable. Surveyors play a key role in this transformative process, which revolutionises urban planning, enhances predictive capabilities, optimises resource management, increases resilience, improves citizen engagement, promotes sustainability, enhances infrastructure maintenance, and achieves potential cost savings. However, capturing, analysing, and managing the vast amounts of data required for a digital twin necessitates advanced geospatial tools. □□ Surveyors have several tools at their disposal and play a critical role in bringing all the technologies together to create city wide digital twins. Such technology examples include the Leica CityMapper which captures oblique and nadir imagery along with Lidar data from the air; the Leica Pegasus TRK Mobile Mapping system, mounted on a vehicle, collects detailed spatial data while navigating city streets. Additionally, Leica 3D laser scanners capture precise details of city infrastructure, contributing to high-quality digital representations. Furthermore, the Leica BLK series offers compact imaging scanners designed for fast and accurate data acquisition both indoors and out. A digital twin not only needs to include what's visible above the ground, but also what's under the ground and critical for keeping a modern city running. Ground-penetrating laser technology further enhances creation of digital twins by making underground utilities visible, providing critical information that can guide city planners in protecting existing and planning new underground infrastructure. Surveyors together with such technologies are key to creating safer, more intelligent cities. □□ In addition to the technologies mentioned above, surveyors also use total stations and the Global Navigation Satellite System (GNSS) for precise geospatial positioning. These tools help determine the coordinates of Ground Control Points (GCPs), which form the framework for stitching together data from all the different technologies. □□ By effectively utilising geospatial technologies, surveyors play a crucial role in creating digital twins of cities. This not only helps in efficiently managing the city but also significantly contributes to reducing the city's carbon footprint, increasing sustainability, and improving the quality of life for its residents. □

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