3 questions for...

...Dr. Nora Reinecke, who has been project manager of the cooperation project Connected Urban Twins (CUT).

As a partner in the consortium of the Coordination and Transfer Office Smart City (KTS), Fraunhofer IESE jointly supports the "Model Projects Smart Cities" in shaping digitalization in the sense of integrated, sustainable urban development oriented toward the common good. IESE is particularly active in digitalization topics such as urban data platforms, urban Digital Twins, city apps and open source.

Dr. Nora Reinecke is the lead coordinator of a cross-city and cross-departmental project team that is driving the further development of urban data platforms and Digital Twins in the cities of Hamburg, Leipzig and Munich. We asked her personally how urban Digital Twins can drive forward sustainable urban development.

1 What is your vision of a Smart City?

My vision of a Smart City is a sustainable, livable and future-proof city that is supported by urban data platforms and urban Digital Twins. Using innovative digital technologies and applications, we can create digital images of the city to simulate "what if" scenarios for various urban development issues.

"Digital Twins of cities are more than just 3D models!"

By linking different data sources and integrating citizen participation, complex urban developments can be better understood and managed. Our three project cities Hamburg, Leipzig and Munich are also setting new standards for inter-municipal cooperation and knowledge sharing by jointly developing replicable and customizable solutions for Smart Cities.

2 What do you think of the statement: "Digital Twins of cities are more than just 3D models"?

I absolutely agree! Urban Digital Twins not only include the three-dimensional visual representation of the physical city, but also have access to extensive urban data from various sources via urban data platforms that develop scenarios with dynamic and interactive models. These models make it possible to simulate and analyze complete urban processes, which contributes to improved planning and decision-making. Urban Digital Twins therefore go far beyond mere visualization. They are to be understood as tools for integrated urban development and the participation of urban society – our focus in the CUT project. In addition, there are many other areas such as mobility, social infrastructure, environmental and green planning, to name but a few.

3 How can urban Digital Twins contribute to a sustainable city of the future?

As tools for planning, monitoring and optimizing urban processes, urban Digital Twins can make a significant contribution to the sustainability of cities of the future. By integrating and analyzing real-time data, they enable a more precise use of resources, for example by optimizing energy consumption and improving traffic flows, which leads to a reduction in emissions and congestion. By combining socio-economic indicators and structural and infrastructural information, urban development and displacement processes can be anticipated, monitored and controlled.

Urban Digital Twins support the development of sustainable infrastructure projects by simulating the effects of different scenarios on the environment and thus promoting well-founded decisions. Last but not least, they contribute to strengthening citizen participation by providing transparent and accessible data that enables citizens to actively participate in shaping their city. Urban Digital Twins can also contribute to the resilience of cities by identifying potential risks at an early stage and supporting the planning of emergency measures.

In summary, urban Digital Twins are not only innovative tools for a wide range of applications in integrated urban development, they also pave the way for sustainable and future-proof cities.