SimCities Reimagined: Digital Twins as Architects of Smart Urbanism

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Abstract—

As cities continue to grow at an unprecedented pace, the balance between progress and sustainability becomes increasingly fragile. Bangalore—once known for its greenery and calm—is now grappling with the weight of its own expansion: traffic congestion chokes its roads, energy demands strain its infrastructure, and unchecked development threatens its environment. In this critical juncture, there is a pressing need for a new kind of vision—one that doesn’t just react to problems, but anticipates them. SimCities Reimagined: Digital Twins as Architects of Smart Urbanism for Bangalore, is a virtual reflection of the physical city, built not just to mirror reality, but to understand and improve it. It integrates machine learning, predictive modeling, and geospatial simulation to create a dynamic environment where city planners, researchers, and citizens can visualize future possibilities and evaluate their outcomes. It empowers users to explore the "what ifs" of urban growth: What if a flyover is built here? What happens to traffic if this road is closed? Can we reduce emissions by placing solar panels on metro lines? Digital Twin doesn't just provide answers—it creates clarity. Unlike traditional urban models, this platform functions as a non-real-time strategic simulation tool, designed to guide long-term decisions. It forecasts traffic behavior, estimates renewable energy output, and simulates environmental shifts—offering a comprehensive view of how the city evolves with each choice made. Through this, it transforms cold data into meaningful insights, allowing stakeholders to build not just a smarter city, but a kinder, more livable one. SimCities is not just a technological leap—it’s a step toward sustainable innovation that serves people while preserving the city’s essence.

Keywords — SimCities, Digital Twin, Urban Planning, Sustainability, Smart Cities, Traffic Forecasting, Renewable Energy, Environmental Analysis, Decision Support System.