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DIGITAL MODELING OF TRANSPORT INFRASTRUCTURE

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Annotation: Digital modeling enables a comprehensive understanding and optimization of transport infrastructure. This paper explores Building Information Modeling (BIM), digital twins, and Geographic Information Systems (GIS) as tools for planning, monitoring, and maintaining transportation networks.

Keywords: Digital twin, BIM, GIS, transport infrastructure, smart modeling

Main Text

Modern transport infrastructure management requires integrated digital ecosystems that allow continuous data exchange between physical assets and virtual models. Digital twins replicate real-world infrastructure in virtual environments, enabling predictive maintenance and performance optimization.

BIM technology is widely used for road, bridge, and tunnel projects, supporting multidisciplinary collaboration during design and construction. GIS tools enhance spatial analysis and facilitate large-scale infrastructure planning by integrating environmental and socio-economic data.

The combination of BIM and IoT technologies provides real-time feedback on structural conditions, helping authorities prevent failures and optimize resource allocation. Future trends point toward fully autonomous, AI-driven digital ecosystems capable of self-diagnosing and adapting to environmental changes.

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