58. A Spatial Decision Support System Integrating Generative AI for Participatory Urban Regeneration

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Urban planning decisions require planners to reconcile many constraints and heterogeneous data, while citizens often struggle to understand the two-dimensional drawings through which plan provisions are communicated. This paper proposes an AI-based decision support framework that translates the guidelines of strategic and municipal plans into geolocated, street-level scenarios that are both perceivable and measurable. The workflow combines 360° streetview imagery, semantic segmentation with cubemap re-projection to quantify the visible composition of each scene, and a multimodal generative model constrained by binary masks, reference images and a prompt split into a fixed part (format, context, plan rules) and a variable part driven by participants' choices. Scenarios are delivered through a WebGIS prototype that juxtaposes the plan layer, the current state and the simulated state, and compares their landcover composition. The approach was tested in Pontecagnano Faiano (Salerno, Italy) on actions foreseen by the Masterplan of the Salerno South coastline and by the strategic document of the municipal plan, namely the downgrading of the SP175 coastal road into a cycle-pedestrian axis, the renaturalisation of illegal settlements and green filters along the urban–rural edge. The paper then formalises evaluation criteria covering plan coherence, accessibility, liveability, sustainability and user comprehension, and discusses the gap between what is visible in an image and actual land use.