

Spatiotemporal Framework for Assessing Urban Performance for Smart Cities

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Abstract

In an increasingly urbanized world, ‘smart planning’ in the form of ‘smart governance’ has grown to take a critical role in developing smart city strategies. Smart planning requires a comprehensive yet practical urban performance evaluation framework to comprehensively assess and identify the areas of a city most in need of or most benefiting from an intervention. However, evaluating urban performance is challenge, not only due to the ambiguity and complexity of the term, but also because of the difficulty of gathering data structured sufficiently for a comprehensive and continuous assessment. This thesis seeks to propose a methodological framework for evaluating spatiotemporal at multiple spatial and temporal scales for contributing to comprehensive urban evaluation. A database is created for 8 U.S. Metropolitan Statistical Areas over a thirty-year timeframe and a handful of select indicators, incorporating a streamlined methodology for multi-sourcing and estimating missing data. Preliminary analysis using a spatiotemporal lens shows that the combinations of analyses that can be performed using this database may contribute to enriching stakeholders’ evaluation and decision-making processes for their locales.

Keywords: City science, Geospatial analysis, Spatiotemporal analysis, Database creation, Smart cities, Decision-making, Urban regeneration, Urban performance