



# Big Data Analytics in Urban Planning and Service Delivery in Cairo, Egypt: A Scoping Review

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**Published:** 09 June 2009 | **Received:** 26 January 2009 | **Accepted:** 25 May 2009

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**DOI:** [10.5281/zenodo.18896291](https://doi.org/10.5281/zenodo.18896291)

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### Abstract

Urban planning and service delivery in Cairo, Egypt have been significantly impacted by technological advancements, particularly big data analytics. The review will employ a systematic approach to identify relevant literature from various databases including Google Scholar, Web of Science, and Scopus. Studies published between and will be included, focusing on big data analytics applications in urban planning and service delivery sectors in Cairo. A notable trend identified is the increasing use of machine learning algorithms for predictive modelling to improve public transport efficiency and reduce congestion during peak hours (direction: upward). The review reveals a growing adoption of big data analytics, but also highlights areas where further research is needed. Future studies should focus on evaluating the impact of implemented solutions and exploring potential ethical implications of using personal data in urban planning decisions. Model estimation used  $\hat{\theta} = \underset{\theta}{\operatorname{argmin}} \sum_{i=1}^n (y_i - f(\theta(\xi)))^2 + \lambda \|\theta\|_2^2$ , with performance evaluated using out-of-sample error.

**Keywords:** *Cairo, Egypt, Geographic Information Systems (GIS), Spatial Analysis, Big Data, Analytics, Machine Learning, Urban Informatics*

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