## Commuters Trip Purpose Decision Tree Based Model of Makurdi Metropolis, Nigeria and Strategic Digital City Project

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**Abstract :** Decision tree models are versatile and interpretable machine learning algorithms widely used for both classification and regression tasks, which can be related to cities, whether physical or digital. The aim of this research is to assess how well decision tree algorithms can predict trip purposes in Makurdi, Nigeria, while also exploring their connection to the strategic digital city initiative. The research methodology involves formalizing household demographic and trips information datasets obtained from extensive survey process. Modelling and Prediction were achieved using Python Programming Language and the evaluation metrics like R-squared and mean absolute error were used to assess the decision tree algorithm's performance. The results indicate that the model performed well, with accuracies of 84% and 68%, and low MAE values of 0.188 and 0.314, on training and validation data, respectively. This suggests the model can be relied upon for future prediction. The conclusion reiterates that This model will assist decision-makers, including urban planners, transportation engineers, government officials, and commuters, in making informed decisions on transportation planning and management within the framework of a strategic digital city. Its application will enhance the efficiency, sustainability, and overall quality of transportation services in Makurdi, Nigeria.

**Keywords :** decision tree algorithm, trip purpose, intelligent transport, strategic digital city, travel pattern, sustainable transport

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