

## 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 research objective is to analyze the suitability of decision tree algorithms in predicting trip purposes in Makurdi, Nigeria and relations with strategic digital city projects. The research methodology involves formalizing household demographic and trip information datasets obtained from an extensive survey process. Modeling and Prediction were achieved using Python Programming Language, and 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 that the model can be relied upon for future prediction. The conclusion reiterates that this model will be used by decision-makers (urban planners, transportation engineers, government and commuters) to make informed decisions on transportation planning and management within a strategic digital city concept which will help to improve 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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