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# EVALUATING PERFORMANCE OF THE SARIMA MODEL IN FORECASTING DAILY KTM RIDERSHIP TRENDS

[Far East Journal of Mathematical Sciences](#) • Article • Open Access • 2026 •

DOI: 10.17654/0972087126033

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## Abstract

Accurate ridership forecasting is crucial for optimizing public transportation operations, including scheduling, capacity planning, and resource allocation. KTM Komuter, one of Malaysia's primary rail services, experiences fluctuations in daily ridership due to factors such as peak-hour demand, weekends, public holidays, and economic conditions. This study aims to evaluate the effectiveness of the Seasonal Autoregressive Integrated Moving Average (SARIMA) model in forecasting the daily KTM Komuter ridership. The dataset obtained from Malaysia's official open data portal, spans from the period of October 1, 2023 to January 31, 2025, captures daily trip counts across KTM Komuter stations. The analysis involved exploratory data analysis, stationarity testing, diagnostic checking, and SARIMA modeling to identify the optimal model. The results indicate that the SARIMA(0, 0, 2)(0, 1, 2)<sub>12</sub> model successfully captures ridership patterns, achieving a mean absolute percentage error

(MAPE) of 9.17%, thereby, demonstrating reliable forecasting accuracy. The findings highlight SARIMA’s potential in improving train scheduling, capacity planning, and resource allocation. However, the model’s reliance on historical data may limit its adaptability to sudden disruptions, such as service interruptions or external economic shifts. Future research should consider integrating external factors, such as weather conditions and macroeconomic indicators, or exploring advanced machine learning models to enhance predictive accuracy and adaptability. © 2026 Pushpa Publishing House, Prayagraj, India.

Author keywords

KTM Komuter; public transportation; ridership; time series analysis

Funding details

Details about financial support for research, including funding sources and grant numbers as provided in academic publications.

| Funding sponsor                                                        | Funding number | Acronym |
|------------------------------------------------------------------------|----------------|---------|
| Ministry of Transport Malaysia                                         |                |         |
| Universiti Malaysia Pahang<br><a href="#">See opportunities by UMP</a> | RDU242705      | UMP     |
| Universiti Malaysia Pahang<br><a href="#">See opportunities by UMP</a> |                | UMP     |
| Geran Antarabangsa                                                     | UIC241506      |         |

Funding text

The author sincerely acknowledges the Ministry of Transport Malaysia and Malaysia’s official open data portal for providing access to KTM Komuter ridership data and for their invaluable support in facilitating this research. This research was funded by the Research and Innovation Department, Universiti Malaysia Pahang Al-Sultan Abdullah and Geran Padanan Antarabangsa (RDU242705) and Geran Antarabangsa (UIC241506).

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