



Study on the Impact of Intermodal Connectivity on Passenger Attraction and Travelling Consistency of Passenger in Kelani Valley Railway Line

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By

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DECLARATION OF THE CANDIDATE AND SUPERVISOR

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Abstract

The public transport landscape in Sri Lanka encompasses a variety of modes, with buses and railways being the primary forms of inland transportation. Buses cater to the majority of passenger demand, while railways handle a smaller share but still hold crucial importance for the overall transportation network. The integration of these modes with others like cars and three-wheelers is essential for their effective operation. Railways function exclusively on dedicated tracks, distinguishing them from roads where different vehicles coexist. This setup presents challenges, as railways struggle to attract passengers without direct access to tracks and stations. To mitigate this limitation, the focus is on creating interconnected and intermodal transportation networks. Many journeys involve multiple modes, particularly when public transport is the primary mode. Passengers often begin and end their trips at specific terminals, underscoring the significance of intermodal connectivity. Intermodal connectivity is especially vital for railways, as it facilitates access to the rail network. Methods like feeder services, park and ride facilities, kiss and ride facilities, and cycling are recognized strategies for enhancing this connectivity. In Sri Lanka, buses serving as feeder services are pivotal in supporting the railway system. Terminal areas also feature kiss and ride facilities, allowing drop-offs by private vehicles or three-wheelers. Moreover, the concept of park and ride extends to motorcycles. However, inadequate parking at railway stations leads passengers to park vehicles in nearby locations. This study primarily addresses challenges in maintaining consistent passenger attraction due to intermodal connectivity issues when public transport acts as a link to the railway system. Addressing these challenges can be enhanced the efficiency and effectiveness of the overall public transport network, particularly in terms of integrating and accessing the railway system. The primary focus of the study is to analyze issues related to intermodal connectivity and the utilization of public transport as a connecting mode to the railway system. By addressing these problems, efforts can be made to improve the overall efficiency and effectiveness of the public transport network, particularly in terms of the integration and accessibility of the railway system. A comprehensive analysis of these issues will provide valuable insights and recommendations to improve intermodal connectivity and promote the seamless integration of public transport modes, ultimately enhancing the passenger experience and encouraging the use of sustainable transportation options.

The study is structured into five key chapters: introduction, literature review, methodology, discussion and analysis, and conclusion. These chapters collectively provide a holistic view of the research, guiding readers through its objectives, contextual background, research methods, findings, and implications.

This study adopts a comprehensive mixed-methods approach, combining quantitative and qualitative methodologies to delve into the intricate dynamics of intermodal connectivity's impact on passenger attraction and consistency within railway travel. The primary research focus centers on establishing a connection between passengers' travel consistency along the Kelani Valley railway line and the distance covered using the access mode. To tackle this, the quantitative approach leverages the formulation of mathematical models, hypotheses, and theories, providing a structured framework to investigate these phenomena. In parallel, the qualitative dimension of the study probes the qualitative facets of intermodal connectivity, employing the Likert scale to gauge its influence on passenger attraction.

Data for this research is meticulously gathered through a comprehensive questionnaire distributed to the study's participants. The forthcoming methodology chapter will meticulously expound upon the data collection process, offering a thorough analysis and discussion of the collected information. Employing a diverse array of analytical techniques, the study aims to derive meaningful insights and draw pertinent conclusions from the amassed dataset. Through this mixed-methods approach, the research aspires to furnish a holistic understanding of the intricate interplay between intermodal connectivity, passenger attraction, and travel consistency within the distinctive context of the

Kelani Valley railway line. The investigation focused on three independent variables: access distance, total cost of access mode, and total time spent in access mode. The study utilized regression analysis and Pearson's correlation to derive meaningful insights that have important implications for the company's future strategies.

Among the variables under scrutiny, the analysis demonstrated that the total distance covered by the access mode was the only significant factor affecting the consistency of passenger travel. The statistical analysis yielded a noteworthy P value of 0.002, indicating a statistically significant association between total distance traveled and travel consistency. This outcome suggests a strategic avenue for the railway company: by improving the distance passengers travel using access modes, the company can enhance intermodal connectivity and potentially attract a larger customer base. The correlation analysis provided further insights, revealing relationships between all three variables (total distance, total cost, and total time) and the consistency of passenger travel attraction. Specifically, the total cost associated with the access mode showed a strong positive correlation, suggesting that higher costs were linked to increased travel consistency. Conversely, total distance covered by the access mode and total time spent in the access mode exhibited robust negative correlations, indicating that longer distances and travel times correlated with reduced travel consistency. Although these variables were not integrated into the final regression model, their significance should not be ignored. To ensure a positive passenger experience, the company should proactively manage and optimize total cost and total time factors. Based on these discoveries, the study recommends that the railway company concentrate its efforts on enhancing intermodal connectivity by prioritizing improvements to the distance traveled using access modes. This can be achieved through various means, such as refining access routes, establishing efficient public transportation connections, and promoting walking and cycling as viable access modes. Concurrently, vigilant management of the total cost and total time variables is crucial to prevent potential negative impacts on passenger experience. The company should explore cost-effective strategies, such as offering affordable ticket options and implementing streamlined scheduling and operational practices to minimize travel times. To conclude, this study underscores the considerable influence of intermodal connectivity on the consistency of passenger travel attraction. The findings emphasize the significance of factors such as access distance, total cost, and total time in enhancing intermodal connectivity and drawing more passengers. By placing a priority on improving access distance while also effectively managing total cost and total time considerations, the railway company can optimize its services, creating a seamless and convenient travel experience for passengers. Ultimately, this approach could lead to heightened travel consistency among passengers and contribute to the long-term success of the company.

Key Words: Public Transportation, Railway, Passenger Attraction, Inter-model connectivity, Travelling Consistency, Kelani Valley Railway

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