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**A DEMAND-BASED SMART PARKING  
MANAGEMENT STRATEGY FOR GALLE ROAD  
CORRIDOR**

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(238024V)

Degree of Master of Science in Civil engineering

Department of Civil Engineering

University of Moratuwa

Sri Lanka

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Thesis submitted in partial fulfilment of the requirements for the degree Master of  
Science in Civil Engineering

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## **DECLARATION**

### **Candidate**

I declare that this is my own work, and this thesis/dissertation does not incorporate without acknowledgement any material previously submitted for a degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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### **Supervisor**

The above candidate has carried out research for the master's dissertation under my supervision.

Name of the supervisor: Prof. J.M.S.J. Bandara

Signature of the supervisor:

Date : 29.08.2025

## ABSTRACT

This study demonstrates the potential for implementing a demand-based parking management strategy to improve on street parking space utilization in urban areas. It further proposes the development of a mobile application as the most feasible solution to collect real-time occupancy data and implement dynamic pricing. The Galle Road corridor was selected as the study area for this research due to its high vehicle and parking demand, and diverse land use patterns. This research utilizes historical on street parking data analysis to gain insights into vehicle distribution patterns, parking durations, and demand fluctuations. Utilizing vehicle speed data from the Galle Road corridor and on-site parking occupancy surveys, this analysis explores the correlation between vehicle speeds and parking demand and proposes a price-based vehicle management strategy, suggesting that speed variations at specific locations can initially serve as a proxy for parking demand. Although data limitations mean this relationship should be interpreted cautiously, it provides a basis for demand estimation when direct crowdsourced data are unavailable. The proposed strategy identifies high- and low-demand sections, adjusts prices dynamically, and uses guidance to redirect drivers to vacant legal spaces, converting lost parking demand into paid stays and balancing parking distribution. Specifically, real-time price adjustments based on observed demand encourage more balanced parking behaviour and reduced roadside parking congestion in popular areas. Key findings show that dynamic pricing and redistribution can boost overall space utilization and increase total daily revenue. The study further recommends developing a user-friendly mobile application with features that allow drivers to view current parking rates, find available spaces, and report occupancy. Overall, the research offers a novel framework indicating that integrating parking demand with adaptive pricing via mobile application leads to more efficient parking operations and increase the revenue. These insights provide actionable guidance for city planners and parking operators seeking smarter, more responsive parking solutions.

**Keywords:** *Roadside Parking management, Demand based strategies, Smart parking solutions, Parking pricing*

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