

# Identifying the Key Factors to Re-Design a Sustainable Transportation Device for Postmen in Sri Lanka Postal Department

**URESHA E.D.T.<sup>1\*</sup> and RANASINGHE W.M.N.D.<sup>2</sup>**

<sup>1,2</sup>Department of Integrated Design, Faculty of Architecture, University of Moratuwa, Sri Lanka

<sup>1</sup>[thiranesha@gmail.com](mailto:thiranesha@gmail.com), <sup>2</sup>[dilshanir@uom.lk](mailto:dilshanir@uom.lk)

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**Abstract** – This study aims to address the key factors to consider the transportation method currently used by the postmen in the Sri Lanka postal Department, which currently uses general-purpose bicycles and motorbikes that are not specifically designed for postal delivery. With the evolution of postal routes since the 1960s, during the British colonial era, the demands on postmen have significantly changed. As cities expanded and postmen's beasts became smaller, motorcycles gave way to bicycles (Department of Posts Sri Lanka, n.d) In the current context some postmen are using their motorbikes and some of them are using bicycles. These general-purpose transportation modes now fall short of meeting the specific needs of modern postal delivery, Particularly in terms of sustainability and ergonomic design. Currently, the Sri Lanka Postal Department is seeking to develop postman's transportation devices to develop their services Currently, the Sri Lanka Postal Department is seeking to develop new transportation devices to enhance its services (Lanka News Web, 2023). This study involves identifying the ergonomic requirement necessary to minimise the physical strain and safety enhancement in sustainability approaches. The objective of this research is to analyse and find out the main key factors to consider when designing a new transportation device. The research is conducted by qualitative approach, combining grounded theory and case study methods to explore the challenges faced by postal workers. Data was collected through direct observation and Open-ended interviews done with the postmasters and postmen by focusing on the delivery methods, health, safety, and sustainability issues of the current transportation devices. The context for this study was specifically selected in the Piliyandala area, according to the observation, It is one of the large regions under the jurisdiction of 17 postal divisions with around 528.5 Km, representing a mix of densely populated urban areas and more rural, village-like settings in Colombo District. It revealed that transportation devices need to be developed to give positive interaction and conceit by addressing challenges in physical health, ergonomics, safety, productivity, and sustainability. Current transportation methods, including bicycles and motorbikes, impose significant physical strain, and environmental concerns.



Fig.1 - Poor posture causing long-term health, ergonomic, safety, and device-related issues. (Source: Author Creation)



Fig.2 - Storing the letters without proper storage and Handling the letters with cruel postures (Source: Author Creation)

By incorporating ergonomic improvements like adjustable seating, lumbar support, and shock-absorbent frames, the new design can reduce health risks such as back pain, joint stress, and fatigue. Additionally, safety features such as a low centre of gravity, reflective materials, integrated lights, and secure storage compartments will enhance worker safety. The integration of electric assist technology, and solar-powered charging stations in post offices, where solar panels could charge the bikes, will address environmental concerns while improving the efficiency and sustainability of postal operations. Additionally, it needs to consider vernacular practices built by them such as adapting to the traditional bell, like even if they have their bike horn they are using the traditional bell sound for postmen to signal their arrival at homes, which became an iconic and reliable auditory cue in local communities. Overall, the considered key factors offer a holistic solution that not only improves worker well-being but also enhances productivity and reduces operational costs. By implementing these design considerations, the Sri Lankan Postal Department can modernise its operations, creating a safer, more efficient, and eco-friendly postal delivery system. This approach supports the Department's goals of improving worker health, reducing financial strain, and aligning with global sustainability trends, ultimately ensuring the long-term viability and success of Sri Lanka's postal services.

**Keywords:** Sustainable transportation, ergonomic design, worker well-being, postal delivery, vernacular practice

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