

Delivering more with less: developing the future of Bolivian cargo vehicles

How can sustainable deliveries work in cities with rough roads and limited resources? This master's thesis developed an electric cargo vehicle designed to improve urban deliveries while being adapted to local conditions and manufacturing capabilities.

As online shopping and home deliveries continue to grow, cities around the world face increasing traffic congestion, air pollution, and greenhouse gas emissions. Electric cargo bikes have emerged as a promising alternative to conventional delivery vehicles. However, most existing solutions are developed for European cities with smooth roads, dedicated cycling infrastructure and access to advanced manufacturing technologies.

In Cochabamba, Bolivia, the situation is very different. Delivery riders must navigate uneven roads, heavy traffic, steep hills and limited cycling infrastructure. At the same time, companies often have relatively small financial resources and rely on locally available materials and repair services.

To better understand these challenges, the project was carried out in collaboration with Eco Delivery, a Bolivian last-mile logistics company. Through field observations, interviews with riders and engineers and testing of existing cargo bikes, several key needs were identified: improved stability, greater durability and easier maintenance, among other things.

The result is Tunari 1.0, a digital prototype of an electric cargo vehicle. Unlike traditional cargo bikes, the vehicle uses a narrow four-wheel configuration that improves stability while remaining compact enough for urban streets. The design also prioritises locally available materials and simple manufacturing methods, making future production and repairs easier within Bolivia.

Although the vehicle has not yet been physically built, the project demonstrates how design benefits from being adapted to local conditions. The project provides a foundation for future development of locally manufactured cargo vehicles that can support the growing demand for sustainable urban deliveries in Bolivia.



