



**SUSTAINABLE
INFRASTRUCTURE
PARTNERSHIP**



UPU | UNIVERSAL
POSTAL
UNION



KUALA LUMPUR CITY SKYLINE AT SUNRISE © NUTTAWUTNUY / ADOBE STOCK

MALAYSIA

**GREENING FIRST –
AND LAST-MILE DELIVERY
INFRASTRUCTURE
IN MALAYSIA**



2024

The International Good Practice Principles for Sustainable Infrastructure

set out ten guiding principles that policymakers can follow to help integrate sustainability into infrastructure planning and delivery. They are focused on integrated approaches and systems-level interventions that governments can make to create an enabling environment for sustainable infrastructure. This case study illustrates specific aspects of one principle in a country context, showing good practices and challenges, and considering potential for advancement or replicability.

GUIDING PRINCIPLE 7: ENHANCING ECONOMIC BENEFITS

Infrastructure should create employment, support local enterprises, and build amenities that benefit communities, thereby maximizing and safeguarding its economic benefits.

BACKGROUND

Malaysia, with a population of approximately 33.9 million (World Bank 2022), ranks as the fifth largest economy in the Southeast Asia region, boasting a nominal Gross Domestic Product (GDP) of approximately USD 430.9 billion as of 2023 (International Monetary Fund 2023). Historically, Malaysia's economy was largely dependent on agriculture and commodities, particularly rubber and tin (Hill *et al.* 2012). Over the past few decades, the government has implemented policies to diversify the economy, reducing reliance on these traditional sectors. Malaysia's economic expansion is driven by its diversifying sectors, including manufacturing, services and the digital economy. This growth is further fueled by increasing demands from its growing population and the government's strategic efforts to bolster economic resilience and innovation. The Government of Malaysia's Vision 2020, introduced in the 1990s, and its subsequent economic transformation programmes played a crucial role in this shift (Government of Malaysia 1990). These programmes focused on developing high-tech industries, enhancing education and skills training and promoting foreign investment.

Malaysia's technology and service sector have seen significant growth, becoming a major contributor to Malaysia's GDP. Among the areas that have shown significant growth in recent years are e-commerce and logistics. In Malaysia, the rapid growth of e-commerce has significantly reshaped the logistics sector, leading to a substantial increase in parcel delivery, especially domestic parcels, with a rise from MYR 34.26 million in 2017 to MYR 623.18 million in 2021 (Malaysia, Malaysian Communication and Multimedia Commission 2022).

This expansion of e-commerce has necessitated innovations in first and last-mile delivery, as traditional home delivery methods struggled to keep up with the rising demand. In parallel, the increase in home deliveries raises concerns about road congestion, air pollution and the associated environmental impact (Malaysia, Malaysian Communication and Multimedia Commission 2022). Malaysia's e-commerce market is expected to continue growing, reaching MYR 51.6 billion by 2024 (Global Data's E-Commerce Analytics 2020). To meet the increasing demand and maintain other societal priorities, Malaysia has been at the forefront of integrating sustainable practices into its infrastructure within the realm of logistics and e-commerce.

PRIORITIZING ENVIRONMENTALLY SUSTAINABLE SOLUTIONS

Along with promoting economic growth, the government has been focused on prioritizing solutions that bring co-benefits in terms of environmental and social sustainability. A key aspect of Malaysia's development agenda is its commitment towards fighting climate change. The country has set ambitious targets to reduce its greenhouse gas emissions intensity of GDP by 45 per cent by 2030, relative to the emissions intensity of GDP in 2005 (Malaysia, Ministry of Natural Resources and Environment 2021).

Among other areas, Malaysia has been promoting renewable energy as part of its sustainability agenda. The government has implemented various incentives and programmes to encourage the use of solar, hydro and biomass energy. The Green Technology Master Plan Malaysia 2017-2030 was adopted to guide the national green technology development, aiming to drive Malaysia towards becoming a green community and further enhance the green technology sector (Malaysia, Ministry of Energy, Green Technology and Water 2017). Furthermore, Malaysia's urban development

strategies increasingly focus on sustainability to ensure livable, resilient and inclusive cities, including sustainable urban transportation and green mobility infrastructure. Transportation is the second largest source of emissions in Malaysia, accounting for 27.4 per cent to the national emissions (Universal Postal Union [UPU] 2023). Malaysia's strategic integration of sustainability in its logistics overhaul reflects a holistic planning approach, addressing the call for cross-sectoral sustainability and life cycle considerations in infrastructure projects.

Despite the Government of Malaysia's comprehensive approach to sustainability, as articulated in the Twelfth Malaysia Plan for 2021-2025 (Government of Malaysia 2021), there remains a gap in the explicit integration of these sustainability objectives into newer or updated strategies - specifically for the postal sector. This reflects a need for renewed focus and alignment with the nation's overarching sustainability goals. The most recent strategic direction was the National Postal Strategy implemented by the Malaysian Communications and Multimedia Commission for 2010-2014 (2010). This strategy sought to develop a competitive, innovative and quality-driven postal and courier market, but remains to be updated post-2014.



AERIAL VIEW OF SOLAR PANEL IN THE SELAKAN ISLAND, MALAYSIA

INTEGRATED APPROACHES TO GREEN THE FIRST AND LAST-MILE DELIVERY

In line with national priorities, Pos Malaysia, as the leading parcel service provider and official designated postal operator for Malaysia, is strongly committed to climate action. Despite facing economic hardships, its efforts in pursuing environmental sustainability are demonstrated by a commitment to sustainable e-commerce expansion and greening first and last-mile deliveries, experimenting with various innovative solutions. With the aim of achieving a 30 per cent reduction in its Scope 1 and 2 emissions¹ by 2025 and net-zero emissions by 2050, one of its key initiatives is the introduction of electric vehicles, with a goal of 100 per cent electrification by 2030 (Pos Malaysia 2023). As of 2023, a total group emissions reduction of 9.96 per cent from the 2021 baseline has been achieved, with the post and parcel segment realizing a 16.79 per cent reduction (Pos Malaysia 2024).

This gradual transition to replace the entire aging vehicle fleet, aligned with vehicle replacement schedules, has been initiated with the use of over 5,000 electric bikes for the delivery of mail and packages, achieving a zero-carbon footprint in these operations; but it is gradually being extended to other vehicles (Pos Malaysia 2024)

Despite the relatively low cost of fuels in Malaysia compared to global prices, this logistics provider is demonstrating that transitioning to an electric fleet is economically beneficial, with anticipated savings in operational costs and spare parts. The transition's impact is significant, equating to saving 1.2 million litres of petrol and 4.0 million litres of diesel (UPU 2023).

¹ Scope 1 emissions are direct greenhouse gas (GHG) emissions from sources that are owned or controlled by an organization. This includes emissions from company vehicles, facilities, and other physical assets. Scope 2 emissions are indirect GHG emissions associated with the purchase of electricity, steam, heat or cooling that the organization consumes, but are generated at sources owned or controlled by another entity (World Resources Institute and the World Business Council for Sustainable Development 2022).



100% ELECTRIC-POWERED DELIVERY VANS

To power that new fleet of vehicles, new electric mobility infrastructure is being introduced at postal offices - meeting the growing internal demand for powering the electric vehicle fleet. Moreover, Pos Malaysia plans to equip over 400 of its facilities with solar photovoltaic (PV) technology, demonstrating a commitment to renewable energy integration in its operations (UPU 2023). These are expected to contribute to the electricity necessary to operate an electric fleet.



This modernization and expansion of logistics infrastructure can have another co-benefit of creating new job opportunities in the sector. This includes not only direct employment in logistics and postal services but also in ancillary sectors like renewable energy, and maintenance services for electric vehicles and solar installations. Furthermore, the use of electric vehicles and solar panels can stimulate local businesses by requiring local suppliers and service providers, thereby supporting the local economy. Pos Malaysia has observed an increase in the number of suppliers specializing in green technologies for vehicles and solar energy solutions (Pos Malaysia 2024). By involving MSMEs in the green expansion of its logistics sector, Malaysia is distributing economic growth and fostering local innovation, in line with the emphasis of the Green Technology Master Plan Malaysia 2017-2030 on local enterprise engagement and green technology transfer.

Alongside this undertaking, Pos Malaysia aims to harness digital systems to achieve a deeper transformation by implementing telematics across 100 per cent of its vehicle fleet (UPU 2023).² This technology has already demonstrated its efficacy in 2023, where it contributed to a 15 per cent reduction in emissions per vehicle. This reduction is attributed to enhanced route optimization, improved driving behaviours, better maintenance scheduling, minimized downtime, reduced fuel or energy consumption, accurate measurement of charging station efficacy and the potential to extend the lifespan of each vehicle. Given the demonstrated success of this strategy, the potential to use this information to enable the creation of carbon credits is currently being explored.

- 2 Telematics combines telecommunications and informatics to monitor and manage vehicles through Global Positioning System (GPS) technology, vehicle tracking and real-time data analytics, facilitating navigation, diagnostics and emergency services.

In addition to vehicle-related measures, the use of parcel lockers and the establishment of alternative collection points are helping to reduce the number of delivery attempts, thereby decreasing fuel consumption and emissions. This system also enables consumers to pick up their parcels at their convenience.

Traditional delivery methods are being reimagined to accommodate the growing demand while reducing carbon emissions. To ensure these new models enable a real transformation, significant resources have been devoted not only in implementing these technologies but also in integrating them effectively into the existing logistics infrastructure. For instance, the transition to automated systems requires

significant investment in both technology and personnel training. Additionally, there is a need to educate consumers about the benefits of using these new delivery methods (Mohd Yusoff *et al.* 2023).

While efforts to “green the first and last mile” have predominantly focused on reducing carbon emissions through innovative delivery methods, the significance of extending these sustainability measures to other areas such as resource efficiency remains paramount. Additionally, the exploration of impacts on biodiversity and the integration of practices that support ecological conservation could represent a vital dimension for the advancement of these initiatives.





SAMAJAYA LIGHT INDUSTRIAL ZONE WHERE ALL THE MAJOR ELECTRONICS, SOLAR AND SEMICONDUCTOR PLANTS ARE LOCATED, KUCHING, SARAWAK MALAYSIA

REPLICABILITY

In alignment with Malaysia's national commitments to climate action and its ambitious goals to reduce greenhouse gas emissions, enhancing Pos Malaysia's electrification efforts and sustainability is paramount. Creating enabling conditions is essential, for example to incentivize fleet decarbonization and mobilize investment in the necessary grid infrastructure. For instance, strategically placing electric vehicle charging stations at postal offices can attract customers and bridge existing gaps, thereby meeting the growing demand for electrification. Additionally, piloting low emissions zones can further enhance the greening of first and last-mile deliveries, contributing significantly to Malaysia's environmental sustainability objectives.

CASE STUDY – GREENING FIRST – AND LAST-MILE DELIVERY INFRASTRUCTURE IN MALAYSIA

KEY INSIGHTS



- ▶ For Malaysia, diversifying beyond traditional sectors like agriculture to include high-tech industries and services, including green logistics, requires upgrading digital and physical infrastructure to support this strategic move towards a more resilient economy.
- ▶ Pos Malaysia's strategy to green its growing demand for first and last-mile delivery services not only showcases the potential for postal and logistics services to contribute significantly to environmental sustainability objectives, but also highlights the need for enhanced infrastructure to accommodate eco-friendly logistics practices.
- ▶ Wider government support can improve the effectiveness of sustainable practices in logistics and e-commerce in Malaysia, encompassing both investment in sustainable infrastructure and policy frameworks that encourage and incentivize infrastructure development for green initiatives.

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