




GOING THE LAST MILE IN ELECTRIC MOBILITY

*Insights on IFC's support for
market creation and early-
stage project development*



Enhancing mobility for people and goods is a key driver of economic growth and access to opportunities in emerging markets. However, transportation is also a carbon-intensive activity that generates greenhouse gas (GHG) emissions and local pollutants. Making transportation sustainable will require scaling up public and private investment in transportation methods which use little or no fossil fuel. Electric mobility (e-mobility) offers an attractive solution in many regions. IFC supports the development and scale up of investments in e-mobility in emerging markets, bringing the world closer to a low-carbon future.

IFC seeks early engagement with both public and private entities to develop new private investment opportunities in e-mobility. Our partnerships help fill in market gaps and remove legal and regulatory barriers. Over the last two years, IFC has supported public and private clients through the implementation of multiple early-stage and pre-investment projects to develop investment opportunities in the sector. These e-mobility projects have encompassed a wide range of preparatory activities such as market assessments, identification of enabling reforms, and business model development. IFC has also supported investment project preparation and piloting.

This five-part Knowledge Series “Scaling Up E-mobility” illustrates IFC’s early-stage work to develop new private investments in e-mobility. The series presents IFC’s experience addressing market gaps and creating new investment opportunities in four segments of e-mobility: charging infrastructure, electric two-wheelers and three-wheelers, battery-electric buses, and last-mile transport services.

Growing e-commerce activity and exploding urbanization are driving a significant increase in last-mile transportation, defined as the final leg of a passenger or cargo journey from a transportation hub to a destination. Two-wheeler (2W) and three-wheeler (3W) vehicles are frequently used for last-mile journeys, making the segment an excellent candidate to lead transit's clean energy transition.

What are the challenges and opportunities?

Demand for all types of transit shifted markedly during the COVID-19 pandemic. Both delivery services and shared mobility services grew enormously while demand for public transportation fell in most cities. As the pandemic recedes, many public transportation operators are trying to regain lost ridership by increasing passenger comfort and convenience. Improving the last-mile connectivity of public transport networks is a critical factor in increasing convenience and quality of service.

In addition to improving passenger transit connectivity and offering an affordable solution for urban deliveries, electric last-mile services reduce fossil fuel dependency, greenhouse gas emissions, air pollution, and noise. An analysis carried out by the World Economic Forum in January 2020¹ indicated that demand for urban last-mile delivery was expected to grow by 78 percent by 2030, leading to a 36 percent increase in vehicles on the road and causing a 31 percent increase in vehicular greenhouse gas emissions and 21 percent rise in congestion. Changes wrought by the pandemic are likely to intensify these trends. Investing in electric last-mile transportation is a key step in transitioning cities to a sustainable future.

Despite the advantages of electric last-mile transportation, there are still barriers to implementation in many emerging markets. Designing efficient last-mile services can be challenging as operators must account for limited EV driving ranges, charging times and the location of charging stations. Political support and enabling regulations are needed to help promote a sustainable electric transition and remove concerns about both EV technology and the residual value of the vehicles.

How is IFC supporting market development and helping create new investment opportunities in electric last-mile transportation?

IFC is working to promote enabling policies and develop viable electric last-mile solutions.

IFC and the World Bank worked with the city of Bogotá, developing a pilot project which tested innovative electric last-mile freight delivery services. IFC is currently supporting a similar collaborative project in Mexico City. These projects, which involve local governments and freight and logistics service providers, are aimed at developing viable business models and identifying enabling policy and regulatory tools to scale up the adoption of e-mobility solutions in Latin America.

IFC is also working to develop electric last-mile passenger solutions. For example, IFC is working with the World Bank to support the design of electric last-mile connectivity options to address the mobility needs of underserved populations in Rwanda. The project supports the development of an action plan to integrate electric micro-

1. World Economic Forum. The Future of the Last-Mile Ecosystem.

mobility and ride-hailing passenger services with public transportation in Kigali and explores the feasibility of deploying these services in other cities.

Bogotá, Colombia — Last-mile urban freight delivery services

The World Bank Group is supporting the city of Bogotá in its efforts to promote sustainable transport solutions. Working together with public and private stakeholders, IFC and the World Bank supported the implementation of BiciCarga, an electric last-mile delivery pilot project in Bogotá. BiciCarga became the first successful e-cargo bike distribution model in Latin America, and the city is implementing transit upgrades as a result of the project's success.

The BiciCarga project tested the viability of business models deploying e-cargo bikes, which are large electric-powered bicycles with more cargo space than standard e-bikes. The project also identified advanced policy and regulatory tools which might accelerate the adoption of innovative e-mobility solutions for last-mile freight delivery and foster the mobilization of private sector resources.

Four different companies participated in the project and two operational models (centralized distribution and cross-docking) were analyzed. After monitoring the companies' operations for up to seven months, results were positive in every case. Delivery costs were reduced by approximately 30 percent and carbon dioxide emissions decreased drastically. Customers considered BiciCarga to have had a positive impact on urban pollution and congestion.

The implementation of the BiciCarga project identified key enabling policies and regulations, including the use of incentives and subsidies, the development of an infrastructure plan, and

the homologation of EVs for last mile services. The Secretariat of Mobility of Bogotá is currently working on the implementation of selected recommendations, such as widening cycle lanes in commercial areas to allow e-cargo 2Ws and 3Ws.

Although there are still challenges to scaling up the project, there are also opportunities, such as extending the BiciCarga model to temperature-controlled logistics. The pilot evidenced a viable and attractive solution that is being replicated by other large private logistics companies in Bogota.

Kigali, Rwanda — Last-mile passenger connectivity

Accommodating the growing demand for transportation is challenging in Rwanda, where an increasing number of vehicles has intensified traffic congestion and pollution. Mobility options are still very limited for many of Kigali's residents, especially low-income populations and those who live in areas out of reach of public transit. Many Kigali residents must rely on walking to move around the city.

Facing these challenges, the government of Rwanda has committed to implementing sustainable transportation solutions. Building on the findings of an earlier e-mobility analysis, IFC and the World Bank supported the city of Kigali in the assessment of electric last-mile connectivity solutions and developed an action plan. Key recommendations were grouped by transit type:

E-motorcycle taxis (E-motos): Large-scale deployment is needed to ensure profitability. As upfront cost is one of the main barriers for drivers, vehicle leasing models and vertically integrated operators with in-house drivers seem to be the preferred options. Both plug-in and battery-swapping models are potentially viable. While battery-swapping models reduce

upfront costs and allow a faster deployment, plug-in models result in long-term cost savings.

Electric Three-Wheelers (E3Ws): E3Ws can complement public transportation. Among the different business models studied, combining public transportation with on-demand services could be an efficient alternative to improve the accessibility of poorly-served areas. Bus operators could offer semi-structured routes operating E3Ws and users could book the service in advance.

E-bicycles: Various shared mobility schemes offer different advantages for operators. Free-floating models, where e-bikes are picked up and dropped off anywhere in the city, offer lower operating costs. On the other hand, dock-based systems allow better integration with public transportation and traffic planning, as e-bikes are picked up and dropped off at specific stations. In

any case, reaching financial viability is challenging without subsidies. As electricity and battery costs represent more than half of the costs of the e-bike fleet, the assessment recommended the deployment of a regular bike-sharing system, leaving e-bike shares for later development.

Besides selecting potential areas where e-mobility could complement the public transportation system, the IFC-World Bank project helped to identify specific opportunities for private investment in fleet provision and battery-swapping facilities focused on scaling up the adoption of EVs in last-mile passenger transportation. The project also provided policy and regulatory recommendations for electric last-mile connectivity solutions in Rwanda, recommending financial incentives to reduce upfront costs and preferential electricity tariffs to accelerate implementation and improve viability.

IFC is supporting municipalities and private sector clients in implementing electric last-mile solutions, from identifying enabling policies to developing innovative pilot projects that can be scaled up. IFC leverages its experience to provide key recommendations to scale up investment opportunities and mobilize private sector resources. IFC can also assist private clients in decarbonizing their supply chain through the preparation and scoping projects to electrify last-mile logistics.

This series of notes on creating markets and investment opportunities in e-mobility also includes:

- **Creating an Enabling Environment for Private Investment in Electric Mobility**
- **Charging Infrastructure Powers the Electric Mobility Transition**
- **Electric Buses: Finding the Right Business Model**
- **Starting Small but Aiming Big: Electric Two-wheelers and Three-wheelers**

This note was written by **Indo Lazaro Aranda**, Investment Analyst; **Madalina Pruna**, Investment Officer; and **Daniel Pulido**, Senior Investment Officer at IFC.

Follow us on LinkedIn at **IFC Infrastructure** and find us online at **www.ifc.org/infrastructure**, **www.ifc.org/transportation** and **www.ifc.org/emobility**.