

SOLUTIONSPLUS I Scale-up concept note

Quito, Ecuador

SOLUTIONSplus



Background

National and Local Low-Carbon Mobility Policies

Ecuador has implemented several initiatives to advance transport decarbonization. The Nationally Determined Contributions (NDCs) target a 9% reduction in GHG emissions by 2025, with a 21% reduction if additional international resources are secured. Key projects include new public transport systems in Cuenca, Quito, and Guayaquil.

The Energy Efficiency Law (LOEE) of March 2019 mandates that all new public and commercial vehicles be zero-emissions by 2025. However, the Energy Competitiveness Law, passed in January 2024, postpones this requirement to 2030 due to limited e-mobility incentives, raising doubts about feasibility.

The 2021 reform of the Law on Road Transport promotes e-mobility by offering incentives such as exemptions from vehicle circulation restrictions and free use of paid parking spaces for electric vehicles (EVs). Additionally, public and commercial parking spaces must allocate at least 2% for EVs.

The National Electromobility Strategy (ENME), developed in 2021 but not officially adopted, suggests using Ecuador's clean energy matrix to support electric mobility with incentives and financing. The National Sustainable Urban Mobility Policy (PNMUS), launched in June 2023, guides municipal governments to promote sustainable urban mobility through various incentive schemes.

In line with international commitments, Quito's Climate Action Plan for Quito (PACQ) aims to reduce GHG emissions by 30% by 2030 and achieve climate neutrality by 2050. The plan prioritizes zero-emissions public transport, active mobility, and low-carbon freight transport.

Quito's Sustainable Mobility Master Plan 2023-2042 (PMMS) aims to mitigate transport sector emissions and includes projects for low or zero-emissions centers and last-mile logistics. Additionally, Quito has approved several ordinances and is working on new regulations to support sustainable and electric mobility.

Despite these efforts, the tools and capacities needed to meet the ambitious decarbonization goals are still being developed.

The SOLUTIONSplus Project in Quito

The SOLUTIONSplus project, funded by the EU's Horizon 2020, aims to advance sustainable urban mobility through innovative e-mobility solutions in 10 global cities, including Quito. Running from January 2020 to June 2024, the project involves city-wide demonstrations, capacity building, and policy development, supported by a consortium of 46 partners.

In Quito, the project focuses on three main components:

1. **Multimodal E-Mobility Hub:** This initiative aims to develop a Zero Emissions Historic Center by introducing locally designed Light Electric Vehicles (LEVs) to improve last-mile logistics. Phase 1 included testing 10 e-cargo bikes, which demonstrated high

performance and potential for scale-up, achieving a CO₂ reduction of 491.74 kg. Local SMEs are producing nearly 20 LEVs for ongoing testing.



Fig 1. Locally assembled e-cargo bikes, long john type (left), rear-load and front-load tricycles (right)

2. **Capacity Building on E-Buses:** The project provides training and technical support on e-buses, including site visits and advisory services. Key activities included a pre-feasibility study for electrifying a BRT corridor and participation in the Latin American e-Mobility Forum.
3. **Mobility as a Service (MaaS) App:** SOLUTIONSplus helped develop a MaaS app for Quito, featuring route planning, schedules, and ticketing. A pilot with 37 students showed positive feedback and potential for wider adoption.

The project has fostered significant progress in Quito's e-mobility initiatives, with ongoing efforts to scale and replicate successful components.

In August 2022, a public event supported by the Municipality and academia (CATENA and EPN) introduced SIDERTECH and E-CARGO BIKE prototypes to gather feedback on design and usability. Security concerns about transported goods influenced the final accessory choices.

In September 2022, the e-cargo bikes underwent performance and safety tests by the National Polytechnic University's mobility lab (LIAVMS), leading to design adjustments. Meanwhile, 20 private actors expressed interest in the pilot.

Between November 2022 and January 2023, 10 e-cargo bikes of 3 models were tested by 7 logistics operators, including food distributors, couriers, and recycling associations, within a designated area in Quito's Historic Center.

A cross-docking platform was set up on Bolivar Avenue, where 6 of the 10 e-cargo bikes were parked and charged. The remaining 4 bikes were given to participants for charging and parking at their own locations.

During the 2-month pilot, the bikes covered 1,071 km, transported 16 tons of cargo, made 229 trips, delivered 956 packages, and collected recyclables from 154 points, reducing emissions by 491.74 kg CO₂e. Five out of seven participants rated the vehicles as excellent and saw efficiency gains, such as increased deliveries and income.

In January 2023, 6 out of 8 operators from Phase 1 opted to continue using the bikes, which have since transported 300 tons, traveled 25,000 km, and avoided 6 tons of CO2. Further testing of 4 e-quadracycles and 4 e-vans by large distributors and municipal companies is ongoing.

Component 2: Technical Advice and Capacity Building on E-Buses

The SOLUTIONSplus project provided technical support, capacity building, and business model development to local actors in Quito. In 2022, regional training focused on e-buses, financing, and charging infrastructure, benefiting staff from Quito's Mobility Secretariat and Municipal PTO. Key activities included participation in international e-mobility events in Berlin, Bogotá, and Madrid, as well as a pre-feasibility study for electrifying the Corredor Central Norte BRT corridor.

An Expert Advisory Board was also established to advise on the Labrador-Carapungo e-BRT Corridor. In March 2024, a delegation from Quito attended the Latin American e-Mobility Forum in Bogotá, learning from regional e-mobility leaders. Quito also engaged in SOLUTIONSplus activities like site visits, e-courses, and international conferences on various e-mobility topics.

Component 3: Mobility as a Service (MaaS) App

The SOLUTIONSplus project developed digital tools for Quito's Integrated Public Transport System, including:

1. **MaaS App La Quiteña:** Multimodal route planner, PT schedules, and e-wallet for ticket purchases.
2. **Web App Assistant:** For topping up e-wallets at ticket booths.
3. **Mobile App My Check:** To validate PT tickets at stops.

In October 2023, a pilot involving 37 students from EPN used the app to plan journeys and manage tickets. Of the 216 tickets issued, 75% were validated via the app. A survey showed 88% of students would use the app regularly if fully available, and 80% supported expanding it to include other public transport options.

About the Project

Goal

This scale-up concept aims to accelerate Quito's transition to low-carbon mobility, building on SOLUTIONSplus results. The focus is on institutionalizing low-carbon mobility, developing policies, and introducing digital tools for urban transport, contributing to reduced GHG emissions, improved air quality, and sustainable mobility.

Objectives:

1. Institutionalize low-carbon mobility by creating a multi-stakeholder engagement strategy and capacity-building program in collaboration with universities.
2. Develop regulatory frameworks at national and local levels to scale up pilots across Ecuador.
3. Continue pilot implementation, including:
 - Deploying e-vans and LEVs for 16 private companies in Quito's Historic Center.
 - Developing optimization models for public transport electrification.

- Introducing digital solutions for multimodal integration, focusing on gender inclusion.

Scale-up Approach

The SOLUTIONSplus team, UNEP, and other partners collaborated with local stakeholders and universities to prepare for the GEF-7 and ACCESS projects. This effort ensures knowledge transfer, strengthens local capacities, and secures \$4 million for scaling SOLUTIONSplus from 2024 to 2029.



Projects SOLUTIONSplus, GEF 7 and ACCESS complement each other and benefit from their synergies.

The scale-up approach aligns with Ecuador's national low-carbon mobility policies, all tied to the country's Paris Agreement and Agenda 2030 commitments. This project supports national goals for economic growth, circular economy, ecological transition, and climate change mitigation.

National Policies and Plans:

- **National Development Plan (PNCO):** Supports investments in new technologies and circular economy, aligning with objectives on economic growth and ecological transition.
- **National Climate Change Strategy (ENCC):** Focuses on reducing GHG emissions in the transport and energy sectors.
- **Nationally Determined Contributions (NDC):** Promotes fleet renewal and sustainable transport, aligning with key outcomes of the GEF-7 proposal.
- **National Plan for Energy Efficiency (PLANEE):** Aims to reduce energy intensity in transport through efficiency improvements and the introduction of electric vehicles.
- **National Sustainable Mobility Policy (PNMUS):** Emphasizes clean, integrated, and safe urban mobility, including restrictions on polluting vehicles and fleet renewals.

Local Policies in Quito:

- **Climate Action Plan for Quito (PACQ):** Aims to reduce GHG emissions by 30% by 2030, with a focus on a Zero Emissions Historic Center.
- **Sustainable Mobility Master Plan (PMMS):** Outlines Quito's sustainable mobility vision, emphasizing low-emission zones, last-mile logistics, and public transport integration.
- **Scale-up Activities**
- The scale-up activities will leverage SOLUTIONSplus project results in Quito to advance low-carbon mobility in Ecuador. This involves supporting policy development,

institutionalizing low-carbon mobility, and introducing digital tools for freight and passenger transport. ACCESS and GEF-7 build on SOLUTIONSplus to amplify the project's impact.

- **Pilots:** SOLUTIONSplus introduced e-vehicles for last-mile delivery in Quito's Historic Center, involving local SMEs and European partners. GEF-7 will expand this with more vehicles and a cross-docking platform, targeting 16 companies. Fast charging infrastructure will also be available. ACCESS will support a data platform for logistics and develop transport optimization models with local institutions to ensure sustainability.
- **Sub-National Policy & Plans:** SOLUTIONSplus developed a city roadmap for implementing a LEV system in urban logistics and advised on micromobility regulations. ACCESS will expand this with strategies for cross-docking platforms and digitalization, linking to Quito's Sustainable Mobility Master Plan (PMMS).
- **National Enabling Framework:** SOLUTIONSplus worked on LEV regulations and e-mobility integration. GEF-7 will focus on standards for energy efficiency, emissions, and safety, plus strategies for large-scale electric mobility and vehicle leasing. ACCESS will develop digitalization guidelines and monitoring frameworks for sustainable mobility.
- **Cross-cutting Component:** SOLUTIONSplus provided impact assessments, business model testing, and capacity building. GEF-7 and ACCESS will continue these efforts, involving local universities and facilitating regional peer-to-peer exchanges to ensure long-term impact and local ownership.

Stakeholder Engagement

- **Urban Electric Mobility Initiative (UEMI):** Launched by UN-Habitat and SOLUTIONSplus, UEMI coordinates SOLUTIONSplus and ACCESS in Ecuador, partnering with MTOP and MAATE since 2020. UEMI supports electric mobility pilots, policy development, and scaling up efforts.
- **Centro de Movilidad Sostenible (CMS):** A non-profit with nearly 20 years of experience in decarbonizing Latin America's transport sector, providing technical and financial support.
- **Wuppertal Institute:** This research institute focuses on sustainable urban mobility, offering technical and financial support.
- **Ministry of Transport and Public Works (MTOP):** Supports the development of the National Policy for Urban Sustainable Mobility (PNMU), focusing on governance, PPPs, and vehicle standards.
- **Ministry of Environment (MAATE):** Contributes to the National Decarbonization Plan, creating a roadmap for transport sector decarbonization.
- **Ministry of Telecommunications (MINTEL):** Regulates telecommunications and supports transport sector digitalization.
- **National Polytechnic School (EPN):** Provides research support, labs, and access to students for project involvement.
- **Municipality of Quito:** Plays a strategic role in e-mobility, particularly through its Mobility and Environment Secretariats.
- **Empresa Eléctrica de Quito (EEQ):** Provides access to charging stations and co-financing for infrastructure development.
- **KIA:** Offers fast-speed charging facilities and contributes to infrastructure expansion and communication efforts.