GRA IN ACTION SERIES

Decision-Making Tool for E-mobility Investments

RATIONALE

Electrification of transport is fundamental for sustainable and low carbon development of the transport sector. However, e-mobility is a relatively new field of action that requires a complex understanding of the subject.

Knowledge sharing and development of support tools for decision makers in the transport sector can help improve and facilitate decision making as well as the prioritization of e-mobility funding options, especially in the Global South. The **"Decision-making tool"** aims at prioritizing considerations for financial actors of e-mobility projects in best investment or return opportunities.

ABOUT THE TOOL

This tool enables city managers, especially in the Global South, to assess the suitability of specific e-mobility investments in cities to suit prevailing urban mobility contexts and specific characteristics of cities. The tool contains a 10-question roadmap that collects points based on the answers the user chooses at each step. These steps are structured as a set of questions focused on characterizing the chances of success and expected positive impact of different e-mobility investments from a high-level perspective. When completed, the tool will produce a score between 0 and 30 that will define the suitability of the e-mobility investment.

OBJECTIVES

- Provide decision makers with **an easy-to-use** tool to assess and prioritize electric mobility investments in their cities.
- Distinguish electric mobility investments **based on their expected positive impact**.

TARGET AUDIENCE

The tool is meant for **decision makers in the Global South** at the national and local level from the transport and energy sector, urban and rural development, and industry policy. It also aims to reach other important stakeholders such as **utilities, private investors**, energy producers, public and private transport fleet operators, finance **and the development community**.

It will be relevant to low- and middle-income countries (LMICs) and also to further developed regions challenged with priorizing e-mobility investments in the transport sector such as South Asia, Sub-Saharan Africa, Eastern Europe, and Latin America.

WHAT E-MOBILITY INVESTMENTS ARE INCLUDED IN THIS TOOL?

E-bus

The tool will help you to understand to what extent shifting city public bus fleets to electric would be feasible at present and to envisage the benefits of that transition. **The tool is aimed at understanding whether the timing and context are right: (i) embrace e-mobility for buses and (ii) deploy e-buses** on a larger scale if the process has already started in the city.

E-taxis

The transition from conventional taxis to electric taxis depends more on the private sector than the city authorities. Nevertheless, city managers are responsible to support this sector in taking bold steps toward decarbonization. The tool assesses the preparedness of the taxi industry and the city authorities in making progress in electrifying taxis. The foreseen city investments include providing dedicated incentives to the taxi industry and covering the costs of effective charging infrastructure for e-taxis, mainly in fast charging.

E-bike sharing system

The tool helps users to understand the chances of success of launching an e-bike sharing system or integrating e-bikes into an existing conventional bike sharing system. **The tool seeks to estimate the potential demand for that** e-bike sharing system according to city's characteristics and its infrastructure.

E-motorbikes

Normally, e-motorbikes sharing systems are privately promoted and operated. This means that no specific investment is expected from the city authorities when it comes to implementing this type of businesses. In any case **cities must underpin these shared mobility services by offering financial incentives to operators**, and by stimulating the demand by other means. The city will also be required to encourage the use of private e-motor bikes and include them in its own municipal fleet.

EV charging network

This tool, when considering EV charging networks, **provides advice on the suitability of investing in deploying electric charging infrastructure in a city**. It is important to be aware of the cost included in installing, operating, and maintaining this type of infrastructure and the tool will help the city managers to establish these costs.

E-kick scooters

Again, public-private collaboration is required to bring access to these types of electric mobility through specific business models and especially in touristic destinations. **Cities can at the same time support these shared mobility schemes by making key investments** aimed at enabling the growth of electric micromobility through purchase incentives, extending cycling infrastructure or building dock stations for e-kick scooters, among others.

ASSESSMENT SCALE

With the score you get in the decision-making tree check the chances of success and suitability of the chosen e-mobility investment in the diagram shown below.

SCORE	CHANCES OF SUCCESS	IMPACT
24-30	MAX	The measure is expected to make a **very high** positive impact in the city, bringing very high environmental, social and economic benefits.
18-24	HIGH	The measure is expected to make a **high** positive impact in the city. Bringing high environmental, social and economic benefits.
12-18	MEDIUM	The measure **would fit relatively well** in the present context in the city and would be expected to contribute to the e-mobility uptake.
6-12	LOW	The positive impact and feasibility of this measure **remain uncertain**. At present, investing in this measure is discouraged in the current context of the city.
0-6	NO	**It is not recommended** to invest in this e-mobility measure and evaluate other options.

DECISION-MAKING TOOL INSTRUCTIONS:

1 Choose the e-mobility investment you want to assess:
- E-KICK SCOOTERS
- E-BIKE SHARING
- E-MOTOR BIKES
- E-CHARGING NETWORK
- E-TAXI
- E-BUSES

2 Go through the diagram following the related color of the chosen option and aggregating the correspondent scores of your answers.

3 Once you have your score, go to the "Assessment scale page" to find out to what extent each investment would be positive to your city.

START

#1 What is the population of your city?
- +3 ☐ Above 1 million
- +1 ☐ From 0.5 to 1 million
- +1 ☐ From 0.2 to 0.5 million
- 0 ☐ Less than 0.2 million

#2 Is your city car centric?
- +3 ☐ Strongly agree
- +1 ☐ Reasonably agree
- +1 ☐ It is a balanced city
- 0 ☐ I don't agree

#3 Is micromobility popular among the population?
- +3 ☐ Yes, definitely
- +1 ☐ Yes but only in certain social groups
- 0 ☐ No

#4 Does the city have roads in bad shape?
- +1 ☐ No
- 0 ☐ In specific areas and parts of the city
- -1 ☐ Yes

#5 How is the presence of tourists in your city?
- +2 ☐ High
- +1 ☐ High in peak seasons
- 0 ☐ Low

#6 Does your city have a dense and large urban center?
- +4 ☐ Strongly agree
- +3 ☐ Reasonably agree
- +2 ☐ Partially agree
- -1 ☐ Not really

#7 Has the city regulated the use of e-scooters?
- +3 ☐ Yes
- +1 ☐ Not yet, but we are working on it
- 0 ☐ No

#8 How is the cycling infrastructure in your city?
- +5 ☐ Very good
- +3 ☐ Good
- +2 ☐ Acceptable
- -1 ☐ Poor

#9 Are private operators interested in the city e-Bike, e-Scooters, e-motorbikes? Do they offer such service?
- +3 ☐ Very interested
- +2 ☐ Relatively interested
- +1 ☐ A private operator is running the bike sharing
- 0 ☐ Not yet

#10 Has the city studied the terms to enable e-scooter sharing systems? (where to park, safety issues...)
- +3 ☐ Yes
- +1 ☐ Yes, however not defined yet
- 0 ☐ No

SCORE

START

#1 What is the population of your city?
- +3 ☐ Above 1 million
- +1 ☐ From 0.5 to 1 million
- +1 ☐ From 0.2 to 0.5 million
- 0 ☐ Less than 0.2 million

#2 Is your city car centric?
- +3 ☐ Strongly agree
- +1 ☐ Reasonably agree
- +1 ☐ It is a balanced city
- 0 ☐ I don't agree

#3 Mode share of bikes?
- +3 ☐ Above 6 %
- +2 ☐ From 3% to 6%
- +1 ☐ From 1% to 3%
- 0 ☐ Less than 1%

#4 Does the city have steep streets?
- +2 ☐ Yes
- +1 ☐ In certain areas
- 0 ☐ No

#5 How is the presence of tourists in your city?
- +2 ☐ High
- +1 ☐ High in peak seasons
- 0 ☐ Low

#6 Does your city have a dense and large urban center?
- +4 ☐ Strongly agree
- +3 ☐ Reasonably agree
- +2 ☐ Partially agree
- -1 ☐ Not really

#7 Is there already a conventional bike sharing system?
- +3 ☐ No, but we have studied it
- +2 ☐ No
- +1 ☐ Yes, it does not work well
- 0 ☐ Yes, it works well

#8 How is the cycling infrastructure in your city?
- +5 ☐ Very good
- +3 ☐ Good
- +2 ☐ Acceptable
- -1 ☐ Poor

#9 Are private operators interested in the city e-Bike, e-Scooters, e-motorbikes? Do they offer such service?
- +3 ☐ Very interested
- +2 ☐ Relatively interested
- +1 ☐ A private operator is running the bike sharing
- 0 ☐ Not yet

#10 Is there a budget to launch the system or add e-bikes to the existing one?
- +3 ☐ Yes
- +1 ☐ Yes, however not defined yet
- 0 ☐ No

SCORE

START

#1 What is the population of your city?
- +3 ☐ Above 1 million
- +1 ☐ From 0.5 to 1 million
- +1 ☐ From 0.2 to 0.5 million
- 0 ☐ Less than 0.2 million

#2 How would you assess the air quality of your city?
- +3 ☐ Very poor
- +2 ☐ Poor
- +1 ☐ Not too good
- 0 ☐ Reasonably good

#3 Does the city have an e-mobility strategy where this measure is included?
- +3 ☐ Yes
- +2 ☐ No, nevertheless it is key for the city
- 0 ☐ No

#4 Is your city car centric?
- +3 ☐ Strongly agree
- +1 ☐ Reasonably agree
- +1 ☐ It is a balanced city
- 0 ☐ I don't agree

#5 How is the presence of tourists in your city?
- +2 ☐ High
- +1 ☐ High in peak seasons
- 0 ☐ Low

#6 Does your city have a dense and large urban center?
- +4 ☐ Strongly agree
- +3 ☐ Reasonably agree
- +2 ☐ Partially agree
- -1 ☐ Not really

#7 Is traffic congestion an issue in the city?
- +3 ☐ Strongly agree
- +1 ☐ Reasonable agree
- 0 ☐ I disagree

#8 Are motorbikes popular in the city
- +3 ☐ Strongly agree
- +1 ☐ Reasonable agree
- 0 ☐ I disagree

#9 Are private operators interested in the city e-Bike, e-Scooters, e-motorbikes? Do they offer such service?
- +3 ☐ Very interested
- +2 ☐ Relatively interested
- +1 ☐ A private operator is running the bike sharing
- 0 ☐ Not yet

#10 Is there a budget to incentivize the use of e-motorbikes in the city?
- +3 ☐ Yes
- +1 ☐ Yes, however not defined yet
- 0 ☐ No

SCORE

START

#1 What is the awareness about e-mobility in your city?
- +4 ☐ There is a good social awareness of it
- +2 ☐ Only some social groups are well informed
- 0 ☐ The topic is unknown for most people

#2 Are there energy suppliers interested in entering the e-charging market?
- +3 ☐ Yes, definitely
- +2 ☐ Yes, we have taken steps towards short term collaborations
- 0 ☐ Not yet

#3 How is the cost per km made with electricity vs combustion fuels in your city?
- +4 ☐ Much cheaper
- +3 ☐ Relatively cheaper
- +1 ☐ In the same range
- -1 ☐ More expensive

#4 Is there a reasonable supply and demand of electric cars in the city?
- +4 ☐ Yes and it's remarkable
- +2 ☐ Yes, its growing slowing
- +1 ☐ Yes, however it is very limited
- 0 ☐ Not yet

#5 Has the country developed or adopted regulation, standards or technical guidelines for electric charging?
- +2 ☐ Yes
- +1 ☐ It's still in process
- 0 ☐ No

#6 Does the city have an e-mobility strategy where this measure is included?
- +3 ☐ Yes
- +2 ☐ No, nevertheless it is key for the city
- 0 ☐ No

#7 Is the capacity of the grid enough to feed a growing demand of electric charging?
- +2 ☐ Yes
- +1 ☐ Depending on how fast the demand evolves
- 0 ☐ No, we would need to strengthen it

#8 Are there already e-taxis in your city?
- +3 ☐ No e-taxis yet
- +1 ☐ Only few e-taxis
- 0 ☐ Yes, quite many

#9 Does the city have a study about how to design its e-charging stations network?
- +3 ☐ Yes
- +1 ☐ We have planned to make it
- 0 ☐ No

#10 Is the city willing to take on the operation and maintenance costs of the network?
- +3 ☐ No, we will delegate to a private operator
- +1 ☐ Yes, with our own resources
- -1 ☐ Less than 4 yo

SCORE

START

#1 What is the awareness about e-mobility in your city?
- +4 ☐ There is a good social awareness of it
- +2 ☐ Only some social groups are well informed
- 0 ☐ The topic is unknown for most people

#2 How would you assess the air quality of your city?
- +3 ☐ Very poor
- +2 ☐ Poor
- +1 ☐ Not too good
- 0 ☐ Reasonably good

#3 How is the cost per km made with electricity vs combustion fuels in your city?
- +4 ☐ Much cheaper
- +3 ☐ Relatively cheaper
- +1 ☐ In the same range
- -1 ☐ More expensive

#4 Is the use of taxi is widely adopted?
- +2 ☐ Strongly agree
- +1 ☐ Reasonable agree
- 0 ☐ It is not a popular service
- -1 ☐ I disagree

#5 How is the presence of tourists in your city?
- +2 ☐ High
- +1 ☐ High in peak seasons
- 0 ☐ Low

#6 Does the city have an e-mobility strategy where this measure is included?
- +3 ☐ Yes
- +2 ☐ No, nevertheless it is key for the city
- 0 ☐ No

#7 How is the relationship between the taxi's representatives and the local government?
- +3 ☐ Very good
- +2 ☐ Good enough
- 0 ☐ Not very good
- -1 ☐ Bad

#8 Are there already e-buses in your city?
- +3 ☐ Yes, some E-buses
- +2 ☐ Not yet but already planned
- 0 ☐ No

#9 Has the city discussed e-taxi adoption with taxi representatives?
- +3 ☐ Yes, we are making progress
- +1 ☐ Not yet but planned
- 0 ☐ No
- -1 ☐ Yes, however there is reluctance

#10 Is the city committed to launch incentives to e-taxis and to invest in dedicated fast-charging points?
- +3 ☐ Yes
- +1 ☐ Yes, however not defined yet
- 0 ☐ No

SCORE

START

#1 What is the awareness about e-mobility in your city?
- +4 ☐ There is a good social awareness of it
- +2 ☐ Only some social groups are well informed
- 0 ☐ The topic is unknown for most people

#2 How would you assess the air quality of your city?
- +3 ☐ Very poor
- +2 ☐ Poor
- +1 ☐ Not too good
- 0 ☐ Reasonably good

#3 What is the mode share of public buses?
- +5 ☐ Above 30%
- +3 ☐ From 20% to 30%
- +1 ☐ From 10% to 20%
- 0 ☐ Less than 10%

#4 Do the bus routes have slopes or go on hilly roads?
- +2 ☐ No
- 0 ☐ In certain areas
- -1 ☐ Yes

#5 Are the existing bus routes shorter than 180km?
- +1 ☐ Yes
- 0 ☐ No

#6 How is the passenger satisfaction with the public bus service?
- +2 ☐ Good
- +1 ☐ Average
- 0 ☐ Low

#7 Is the public bus service provided by private operators?
- +2 ☐ No
- 0 ☐ Yes

#8 Are there already EV-Charging points in your city?
- +2 ☐ Yes, some EV-charging points
- +1 ☐ Very few
- 0 ☐ Not yet

#9 Is there any suitable identified depot to host the e-buses?
- +4 ☐ Yes, this has already been studied
- +2 ☐ Yes, however this has not been studied.
- 0 ☐ No

#10 How old is the bus fleet on average?
- +5 ☐ older than 12
- +3 ☐ 9 yo-12 yo
- +1 ☐ 6 yo - 9 yo
- -1 ☐ Less than 4 yo

SCORE

ACKNOWLEDGMENTS. This paper was prepared under the umbrella of the Sustainable Mobility for All (SuM4All) partnership by the working group on e-mobility led by Marvin Stolz (TUMI) (co-chair) and Philip Turner (UITP) (co-chair). Members of the SuM4All working group provided inputs. Suzanne Spooner (AFD), Benjamin Jeromin (BMZ), Jaime Ruiz Huescar (Cities Forum), Shailendra Kaushik (Cities Forum), Jill Warren (ECF), Stefano Ammirati (FIA), Marc Juhel (FIA), Sheila Watson (FIA Foundation), Justin Coetzee (GoMetro), Maha Mousavi (ICAO), Chrystelle Damar (ICAO), Thilly de Bodt (ICAO), Geert van Waeg (IFP), Mohammed Alsayed (IsDB), Ahmed Al Qabany (IsDB), Angelika Zwicky (KfW), Reiner Koblo (KfW), Stephanie Sohm (Making of Mobility), Arto Keklikian (NCC Canada), Ben Hartley (SEforALL), Nyaga Kebuchi (STA), Maruxa Cardama (SLOCAT Partnership), Nikola Medimorec (SLOCAT Partnership), Mark Major (SLOCAT Partnership), Laura Menzel (TUMI), Insa Illgen (TUMI), Armin Wagner (TUMI), Ha Joo Uyun (UIC), Lucie Anderton (UIC), Francesco Dionori (UNECE), George Georgiadis (U NECE), Sergio Avelleda (WRI), Ben Welle (WRI), Nancy Vandycke (WB), Gurpreet Singh Sehmi (WB), Mary Ngaratoki Fabian (WB), Josephine Njoki Irungu (WB).

We thank CITIES FORUM for the production of the tool and acknowledge the guidance received from the SuM4All Steering Committee comprising Benjamin Jeromin (BMZ), Anne Joselin (FCDO), Sheila Watson (FIA Foundation), Susanna Zammataro (IRF), Atiq Ahmad (IsDB), Alana Dave (ITF), Nicolas Beaumont (Michelin), Ben Hartley (SEforALL), Maruxa Cardama (SLOCAT), Marvin Stolz (TUMI), Jan Hoffman (UNCTAD), Francesco Dionori (UNECE), Jim Walker (Walk21), Benjamin Welle (WRI), Nicolas Peltier (World Bank) and Binyam Reja (World Bank).

This paper is part of the GRA in Action Series funded by the World Bank, the German Federal Ministry for Economic Cooperation and Development (BMZ), the Foreign, Commonwealth, and Development Office (FCDO), and the Michelin Foundation. The paper was funded by GIZ on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ).

Date of release: November 2022. Sustainable Mobility for All (SuM4All) partnership