# E-scooters in Stockholm

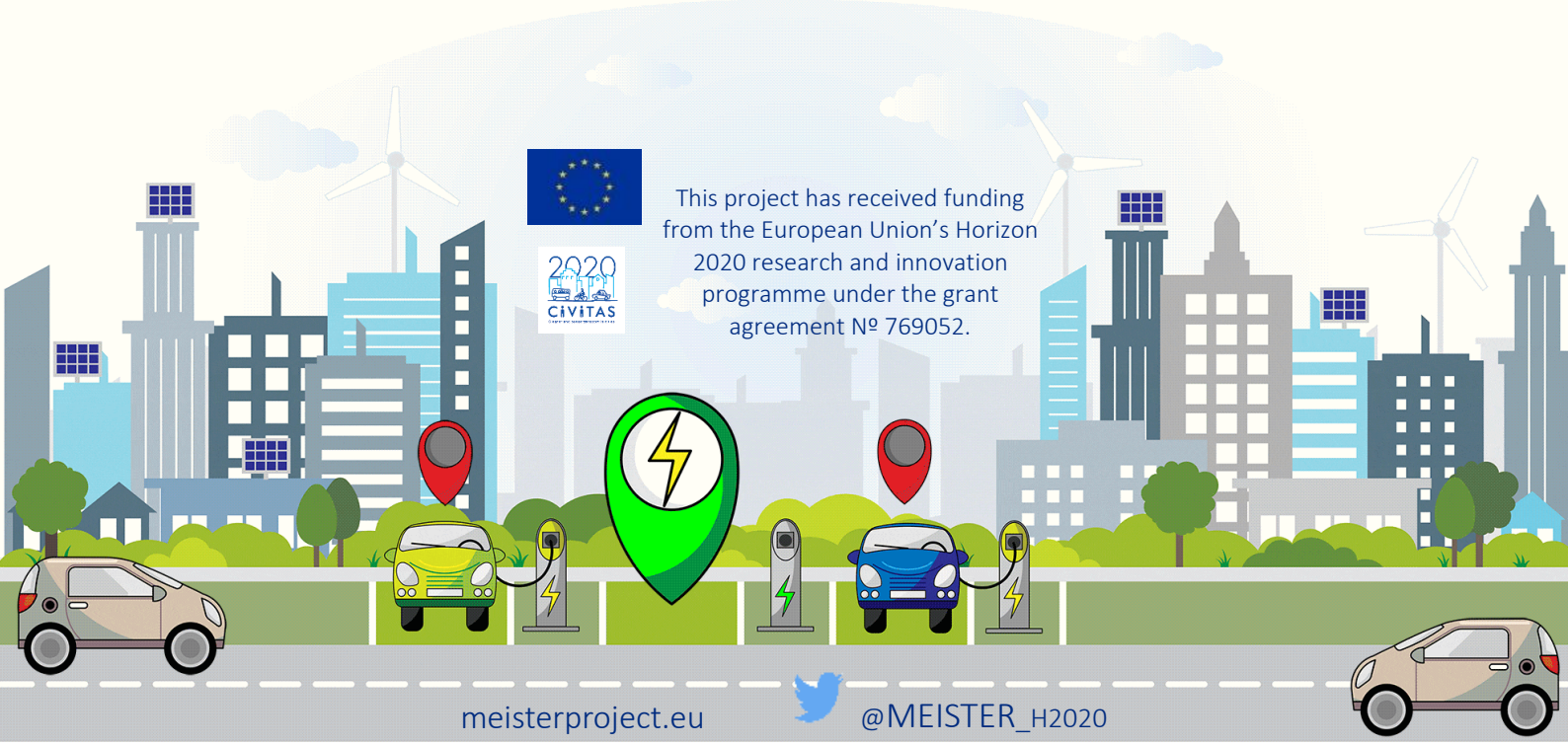
## Logistics, charging and parking

22 October 2020

Anne Faxér & Linda Olsson

RISE Research Institutes of Sweden

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the grant agreement № 769052.



## Background: Why study e-scooter logistics?

Dockless electric rental scooters (e-scooters) have rapidly become part of the urban environment in many cities. In Stockholm, the first e-scooters were introduced in August 2018. By September 2020, the number of e-scooters surpassed fourteen thousand.

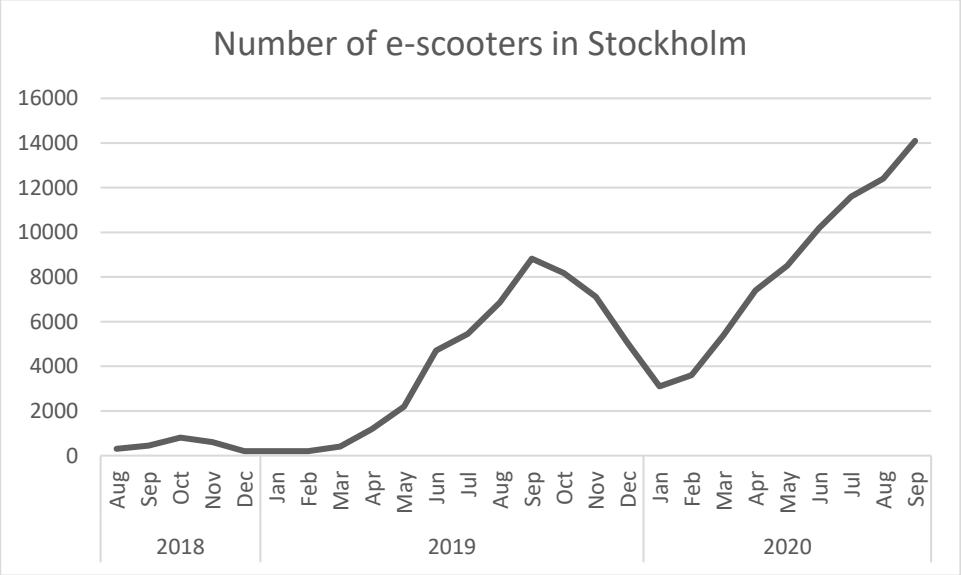



**Figure 1. In two years, e-scooters have gone from zero to fourteen thousand. E-scooter use decreases in winter, when the weather is cold, and streets are covered in slush or ice.**

In Stockholm, as in many other cities, e-scooters cause debate and raise questions. Many people are positive towards the possibility to get around the city quickly and without local emissions. Meanwhile, the sustainability of e-scooters is questioned, and cities need to dedicate resources to the issue of how to integrate e-scooters in the urban environment in order not to harm or inconvenience pedestrians. With the rapid development, knowledge of how e-scooters are used, and how they affect health, environment, and traffic, is lacking.

To fill this knowledge gap, RISE and City of Stockholm have conducted a study on e-scooter logistics, charging and parking, within the Horizon 2020 project MEISTER. The aim of this study was to examine the environmental impact of e-scooter collection, charging and redistribution, and to identify if and how e-scooter logistics and charging may be improved.

A full report, tailored for City of Stockholm, is available in Swedish. This English version has been slightly shortened and focusses more on conditions and results that might be of interest to an international audience.

## Methodology

The study is based on interviews with e-scooter operators and a civil servant, and on document studies including previous research and e-scooter regulations in other cities and countries. To start with, the research team attended one of the monthly meetings that City of Stockholm holds with the e-scooter operators, in January 2020. This enabled a first contact with several operators, and an observation of the co-operation between the e-scooter operators and City of Stockholm.

In March and April, semi-structured interviews with representatives of five e-scooter operators were conducted. The operators are kept anonymous in the report, as the e-scooter business is highly competitive. Operators are generally cautious about sharing details of their operations. At the time of the interviews, three of the operators had a large number of e-scooters while two had a small number. Four of the operators were active in several countries, while one was established exclusively in Stockholm. Interview questions focussed on logistics and charging, and on challenges and opportunities related to these issues.

In June, a civil servant who dedicates a big part of his work to e-scooter issues was interviewed. This interview focussed on what challenges and opportunities that e-scooters mean for City of Stockholm. After having analysed the material from the interviews and document studies, the researchers discussed findings and conclusions with City of Stockholm. This discussion, which was held in September 2020, provided some new information about rental e-scooters that has also been taken into account. During the study, several changes have taken place that were not anticipated at the time of planning but needed to be included. This is described in greater detail in the discussion on results.

In spring 2020, urban mobility changed due to the corona pandemic. The study was planned before the pandemic, and the first interview was conducted on March 19, just when social distancing recommendations started to be made in Stockholm. In that interview, one question about how the pandemic affected operations was included, but otherwise it was carried out according to plan. The subsequent interviews followed the same pattern. Thus, the study does not take effects of the pandemic into consideration.

**Figure 2. E-scooters parked in a central part of Stockholm.**
**Photo by Lennart Johansson, City of Stockholm.**

## Results

The interviews show that with regard to logistics and charging, the e-scooter operators take measures to reduce climate impact and ensure safety. At the time of the interviews, the operators were largely moving away from collecting e-scooters for charging, instead switching to systems with swappable batteries. By reducing the weight and volume of items needing to be transported, lighter vehicles may be used for logistics, and driving distances may be reduced. The respondents described efforts and intentions to use electric vans and cargo bikes for logistics. All charging was reported to take place in operators' or logistics partners' warehouses, using dedicated charging devices and electric installations that comply with Swedish electric safety regulations.

There are differences in how the operators handle placement, charging, redistribution, and moving badly parked e-scooters. In general, some activities are outsourced to logistics partners while others are managed in-house. It differs between operators, which activities that are managed in-house and which are outsourced. The interviews show that operators' attitudes to managing their fleet also differ a lot, from using tailored e-scooter distribution to attract customers to not interfering with e-scooter distribution at all. Some operators dedicate resources to analysing user patterns, to be able to place an optimal number of e-scooters to meet demand in a certain spot. Some operators actively seek out badly parked e-scooters to move them to a proper place. Some operators do not engage in any form of active redistribution unless they get a complaint from City of Stockholm with a photo showing their e-scooter in an inappropriate place.

Something that came up in several interviews is the fact that e-scooter rental is unregulated in Sweden. This makes Stockholm an attractive market. Establishing an e-scooter rental operation does not require any form of permit, neither to rent them out, nor to place them in the urban environment. Operators may put as many e-scooters as they like on the streets. In Stockholm, they may sign voluntary, non-binding agreements with the City, establishing that they will co-operate on issues relating to the urban environment. Still, City of Stockholm receives a large number of complaints, regarding poorly parked e-scooters, from citizens.

According to Swedish law, e-scooters are categorised as bicycles. That means that regulations that apply to bicycles also apply to e-scooters. A bicycle may be parked anywhere for 24 hours, as long as it does not hinder traffic. For example, parking a bicycle against a wall is allowed but parking it in the middle of a sidewalk is not. This regulation works well for privately owned bicycles and e-scooters, that are generally cared for by their owner. However, it does not suffice to control rental e-scooter parking. The operators are responsible for their e-scooters, but the 24-hour regulation applies when a customer parks an e-scooter. Thus, customers may basically leave e-scooters anywhere they like, as long as they do not hinder traffic, and operators may avoid responsibility for parking them neatly. City of Stockholm are authorised to remove bicycles or e-scooters that have been parked inappropriately for 24 hours. However, confirming that they have been in the same spot for 24 hours and removing them requires a lot of personnel resources.

To improve the urban environment, City of Stockholm performed a trial together with an e-scooter operator. Parking hotspots (zones dedicated to e-scooter parking) were created, and e-scooter users were encouraged to park there with a small financial reward. However, very few people were inclined to leave an e-scooter in a designated hotspot that did not coincide with their destination. E-scooter services are rather inexpensive, and the reward was not enough to compensate customers for riding to a hotspot and walking from there. The interview material indicates that although the e-scooter operators find correct parking to be an important issue, they do not use financial incentives to improve their customers' parking habits.

## Concluding discussion

The results indicate that the e-scooter operators work with reducing environmental impact from logistics and charging. This coincides with cost-efficiency and environmentally friendly company profiling. Moving towards swappable batteries is a way to increase income, as not having to remove the e-scooters from the streets to charge them means that they are available to rent at all times, and as the logistics operation may be slimmed down when whole e-scooters do not need transporting. Using electric vans and cargo bikes for logistics might be expected of a business segment that aims to transform urban mobility. Thus, a conclusion is that City of Stockholm does not need to be concerned with improving environmental impact from e-scooter logistics, as it is largely self-regulating.

However, rental e-scooters have a negative impact on the urban environment in the sense that they are sometimes a nuisance to citizens and visitors, which manifests in complaints. Except for a voluntary, non-binding agreement to keep operations neat, e-scooter operators do not need to take action to get customers to park properly. Dock-less e-scooters are attractive at least partly because they may be found and left anywhere, that is the business model. Given that there are no financial incentives for proper parking, and no fine for improper parking, there is little reason for customers to consider where they leave e-scooters.

City of Stockholm does not have authority to regulate e-scooter operators, or to decide where to allow e-scooters, or how many. With e-scooters being categorised as bicycles, the City has little power to improve distribution and parking. If regulations were modified, to give City of Stockholm authority to regulate e-scooter operators and to make e-scooters an individual vehicle category, the City could put pressure on the operators to manage distribution and parking better. They could also create and enforce specific rules for e-scooters, thereby improving urban environment. The Swedish Transport Agency currently investigates applicable legislation and are expected to present results and suggest regulatory modifications in spring 2021.

The e-scooter market has developed incredibly fast, which was not anticipated when the study was planned, in fall 2019. Then, most operators collected their e-scooters every night, to put them back neatly on the street again, with fully charged batteries, the next morning. That situation was what initiated this study. In spring 2020, as interviews were conducted, it had started to change. By fall 2020, not only have the operators reorganised logistics, but many have also started using new e-scooter models (sturdier and heavier, designed to have longer life span). Several of the operators that were established in Stockholm in the spring have ceased operations, and those who remain keep a lot more e-scooters on the streets. As a consequence, some of the results of the study are outdated already at the time of publication. A conclusion to be drawn is that when studying a start-up segment, a year may be too long to complete a study. Future studies might benefit by a shorter and more focussed study period, to ensure that results become as useful as possible.

**Figure 3. E-scooter rider in Stockholm.**
**Photo by Helene Carlsson, City of Stockholm.**