Electric scooter parking practices: understanding the issues

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Executive Summary

In this study, we conducted a series of in-depth interviews and explored parking issues related to the practice of electric scooters (e-scooters). Through semi-structured interviews, we scrutinised e-scooter users' preferences and explored factors contributing to users' intentions and decisions behind different parking practices. We examined how interviewees think that "they" and "others" would park their e-scooters in given situations by showing them pictures of different transport facilities. We found that interviewees perceive poor quality of parking mainly due to the behaviour of other users. Also, interviewees prefer that the e-scooter apps suggest some safe parking places. This desire is slightly stronger for men. Finally, interviewees agreed that miss-parked e-scooters are a serious issue for cyclists and pedestrians. The findings of this study contribute to an in-depth understanding of e-scooter users' experience and have applications for planning a safe infrastructure for e-scooters.

1 Introduction

The rapid emergence of electric scooters (e-scooters) has introduced a set of opportunities and threats to the transport system. E-scooters could substitute and supplement vehicles that operate with fossil fuels (especially for short trips), reducing their drawbacks such as air pollution and congestion [1, 2]. However, the lack of comprehensive transport planning for the e-scooters has caused compatibility issues with other mobility options such as walking and cycling [3].

E-scooters could be operated in motorised and non-motorised infrastructure such as shoulder lanes, sidewalks and bike lanes, and therefore, there is a need to evaluate their riding experience in these facilities [4]. Along with the convenience of picking up and dropping off dockless[1] e-scooters in cities, the miss-

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[1] Sharing services of e-scooters are classified into docked and dockless types. In docked system, an e-scooter is picked up and returned at any station, while in a dockless one, they could be picked up and returned at any location.

parked e-scooters affect all road users' safety and comfort [5]. Thus, there is a need to look into the parking practice of e-scooters closely.

Literature evaluation revealed a lack of comprehensive studies regarding the parking practice of e-scooters. For instance, Brown et al. (2020) examined the parking violations of e-scooters in the US and reported the frequency of impeded access by e-scooters. In a similar vein, Gössling [6] analysed social media content and discussed challenges associated with the introduction of e-scooters. His findings suggest that parking violations were reported as one of the main issues concerning the practice of e-scooters. Yet, there is a dire need to evaluate the parking practice of e-scooters from (non) users' perspectives and possible strategies to regulate them safely. In response, the central focus of this study is to analyse e-scooter (non) users' parking concerns on sidewalks, bike lanes, and motorised facilities through interviews.

2 Methodology

The participants were recruited through different announcements at Chalmers University of Technology. Moreover, we posted on several social media platforms groups such as Facebook to recruit participants. Some participants were also selected via the personal contacts of the authors. Participants could either receive a cinema ticket as a reward or donate the money to charity. We only considered candidates who were Swedish residents[2] and could use social media platforms to participate in online interviews. A total of 10 participants met the research criteria and were in-depth interviewed. All interviews were audio-recorded and transcribed, and all transcribed interviews were validated with participants. For the sake of confidentiality, all personal information in the database was converted to participant numbers.

During the interview, we first informed the participants about the overall purpose of this study, the interview would be completely anonymous, and they could terminate the interview at any time. For each interview, participants were introduced to different scenarios, and a variety of parking issues were discussed with interviewees. All participants were encouraged to express their opinions spontaneously, and follow-up questions prepared beforehand expanded their discussions. The in-vivo coding technique was applied to code the transcribed data [7]. In this method, codes are directly extracted from the transcript, contributing to the analysis to be based on the data. Thereafter, all transcripts were reread, and the assigned codes were controlled to be matched with transcripts to avoid any error in the coding process.

3 Summary of results

The interviewees were first asked to introduce themselves in each interview (e.g. socio-demographic information). Next, the discussion was mainly focused on the parking issues regarding the practices of e-scooters. Several topics were discussed with participants during interviews which are classified into the following themes: (i) users' experience with e-scooter parking; (ii) users' preference regarding parking practices of e-scooters, (iii) evaluating hypothetical scenarios regarding parking practices of e-scooters.

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[2] The reason for such screening is to attract participants who are used to the traffic situation in Swedish cities. Indeed, candidates with different backgrounds (country, education, etc.) who currently live in Sweden were considered in this study.

(i)   Users' experience with e-scooter parking

We divided this interview section into two distinct and interrelated sections to understand the users' experience of e-scooter parking. We first framed the discussion to evaluate how users experience the parking practice of e-scooters as e-scooter riders. Next, we asked participants to share their experiences with miss-parked e-scooters as cyclists, pedestrians, or drivers. From the e-scooter riders' perspective, the lack of enough space in crowded places was their main source of discomfort, specifically when they were in a rush. However, from the other road users' standpoint (e.g. cyclists), they perceived quite low quality of service due to the presence of miss-parked e-scooters on transport facilities.

(ii)   Users' preferences regarding the parking practice of e-scooters

We discussed how participants expect e-scooter apps could contribute to a safe parking practice for e-scooters. The majority of interviewees expect that apps should require more information from users regarding their parking decision. For instance, many users believe that apps should require users to take a picture of their parked e-scooters and submit it to the app in order to terminate their trip. However, some users mentioned that their judgment should be trusted, and such a process would be time-consuming, especially when they are in a rush. Also, there is a difference across gender and age groups regarding how and to what extent users prefer that e-scooter apps should be actively involved in their judgment of their parking decision. For instance, older adult males preferred more inputs from e-scooter apps in terms of the suggestion of safe parking. It should be noted that the sample size of this study is rather small, and this point could be further investigated in future research. Furthermore, some interviewees suggest considering a penalty for users with miss parked e-scooters.

(iii)   Evaluating hypothetical scenarios regarding the parking practices of e-scooters

In this interview section, we first showed interviewees several pictures of transport facilities, e.g. bike lanes and sidewalks. Figure 1 represents an example of a situation where different parking options are introduced to interviewees, and they select how they would park their e-scooter in a given case. Then we asked them where it was more likely they would park their e-scooters in the given situation. Next, we showed the same pictures to the interviewees and asked them how they thought most users would park their scooters. Juxtaposing interviewees' opinions about their parking practices against other users, most interviewees believe they park their e-scooters properly, while others are likely to park their e-scooters middle of sidewalks or bike lanes.

Figure 1. an example of a situation where interviewees were asked how they would park their e-scooters

4 Discussion

The findings from different interview themes have applications for planners and policymakers. Although e-scooter riders perceive a good quality of parking in most situations, it is still helpful to have better regulation for parking practices of e-scooters, especially in crowded places. For example, marking some areas of sidewalks which are safe for parking e-scooters could trigger riders to park their e-scooters in the predefined spots. This point is more crucial for other road users' comfort (e.g. cyclists and pedestrians) who have had the experience of interactions with miss-parked e-scooters. In many cases for other road users, the need for an action to put away the miss-parked e-scooters was the primary source of discomfort.

Based on the findings from the last theme, it seems that participants are well aware of the safe parking practices of e-scooters. In all cases, participants discussed the potential risk of miss-parked e-scooters in different transport facilities and selected the safest spot to park their e-scooters in the given situation. However, they considered that other road users would mainly block sidewalks and bike lanes. This finding needs further investigation as participants' self-image might affect their response, and blaming others for the issue would be a simple solution.

Moreover, the improvement of e-scooters apps with suggesting parking spots was a preferred feature among interviewees. However, different challenges could be associated with such features. For instance, some users might think it would be cumbersome to follow the app's suggestions, and their judgment could be affected by such features. Also, most participants preferred penalties for users with miss-parked e-scooters. This point could be connected to the fact that participants mainly blame others for unsafe parking behaviour, and supporting this policy would not affect them.

Acknowledgments

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Presenter Biography

Khashayar Kazemzadeh is a postdoctoral researcher in sustainable mobility at Chalmers University of Technology. He has received his PhD in transportation engineering from Lund University. Khashayar's research is mainly focused on sustainable mobility and emerging technologies. More specifically, he is interested in analysing the comfort and quality-of-service for powered micro-mobility such as electric bikes and electric scooters.