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Shared e-scooters and gender equity

Learning from women's perceptions and experiences

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Foreword

Jo Field – President of Women In Transport and Chief Executive of JFG Communications

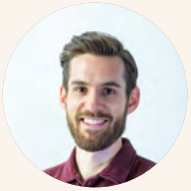
The transport industry has an urgent task on its hands to address the underrepresentation of women across the sector. Change is happening, but slowly. While women are more likely to be absent from decision-making roles in the industry, research like this ensures women's voices are heard.

The gender gap in shared e-scooter use deserves considerable attention from the micromobility sector, and anyone else concerned with gender equity in transport and the urban realm. This research suggests many reasons for that gap by illuminating the thoughts and views of women, which have yet to receive sufficient attention in this area.

The challenge for the sector and governments now is translating the perspectives of women into action at a local and national level. This process has been aided by the first Gender Equity Commission for shared e-scooters, set up specifically to translate the findings of this research into recommendations.

I am delighted that our Chief Executive at Women in Transport, Sonya Byers, chaired the Commission that led the development of a suite of robust recommendations featured throughout the report. The experts on the Commission showed the gap between where we are now and where we need to be to help stem the trends of inequity in e-scooter ridership.

It is now up to decision-makers in industry and government to act on these recommendations. While there are deep-rooted challenges to women's safety and independent mobility, there are also quick fixes policymakers and operators can make. This should be looked upon as an opportunity. Early interventions will maximise women's opportunities to benefit from this transport mode, to move freely and safely around our towns and cities. Addressing the barriers to equitable e-scooter use will also help overcome barriers to gender equity across the urban realm.



Jack Samler – General Manager of Voi Technology, UK and Ireland

The rapid growth of the micromobility market has highlighted the gender gap not only in e-scooter ridership but also in the transport industry as a whole. This type of research will be vital in addressing this. I applaud the expertise of Women in Transport in creating a deeper understanding of all the issues and nuances associated with this inequity in ridership.

This is the first in-depth research to include a Gender Equity Commission and it has been crucial to both me and Voi that this research not only focuses on our own customers but also on the micromobility industry generally, in order to create an objective overview of how women really feel about e-scooter usage. This data and honest feedback provides a valuable addition to our larger roadmap towards inclusive micromobility.

Transport is rarely perceived as an industry that evokes an emotional response, yet this research proves that this is not the case. Women want and deserve to feel safe while travelling; they want transport to fit with their lifestyles; and they seek reassurance that their needs, interests and fears are heard by micromobility operators.

The results and recommendations from this research will inform and inspire us and, hopefully, many others in the industry. Across the board, from physical design to service design, marketing to safety training, we will use this data to create strategic and practical change. It's important that we don't just talk the talk but start to deliver on long standing societal issues.

In addition, sharing the data and recommendations of this research will also greatly support our collaboration with councils and communities to achieve a truly inclusive product and service design. By sharing the research and incorporating it into our strategies and design, we also aim to amplify women's voices so that we can continue to develop this industry sustainably and equally.

1. Executive summary

1.1 Overview

Shared e-scooters are a new micromobility option with the potential to transform how we move around towns and cities. But as ridership numbers have picked up, a trend has emerged: women are less likely than men to ride them. For shared e-scooters to reach their potential, there needs to be gender equity. There is very little specific research exploring why the gender imbalance exists and how we can move towards a more equitable future.

This research report was undertaken with the aim of better understanding women's perceptions of shared e-scooters, and to identify possible solutions to the gender imbalance in ridership.

In November 2021, we ran five focus groups to explore women's perceptions in depth. This was followed by a survey that was live for two weeks in January 2022, with the aim of quantifying some of the themes that emerged from the focus groups. Findings from both data collection stages were shared with the first ever Gender Equity Commission for Shared E-scooters. Assembled specifically for this project, the Commission helped devise recommendations for operators and policy-makers about how greater equity in shared e-scooter ridership could be achieved.

Key findings

The findings indicate that women encounter a range of barriers and few enablers to riding shared e-scooters in the UK. Their experiences provide lessons to inform a more inclusive future for shared e-scooters in England and other jurisdictions.

- The built environment was broadly viewed as hostile – with roads considered dangerous and drivers unsympathetic or actively aggressive. Over three-quarters of all survey respondents (79%) felt that not feeling safe due to infrastructure was a barrier to not using shared e-scooters (more).

> "When I have to scoot in the same lanes as cars I'm frequently beeped at and shouted at when I know I'm not doing anything wrong." (Focus Group 5, Mixed Group, Very regularly)

- It is not easy to learn or understand how and where to ride e-scooters with a complicated patchwork of regulations, private providers and a lack of safe spaces and environments for women to learn. Most riders cited learning for the first time with their peers, while most non-riders wanted a park or car-free space to learn. While most participants felt they understood the law, some non-riders described a bewilderment and fear of being unknowingly caught out and faced with difficult situations.

> "If I don't know exactly what I should and shouldn't be doing [...] At least when I was cycling I could say I have absolutely the right to be in the road – with e-scooters I don't have the knowledge that would give me the confidence to support this." (Focus Group 1, Non-rider Group, Never ridden)

- Both the services offered and the way e-scooters are physically designed had elements likely to prevent women from riding them where they might be helpful. E-scooters are heavy to manoeuvre and cannot carry much, while the mere fact of having to use one's phone, faulty or frustrating technology, and local authority-imposed restrictions can impinge on women's sense of safety and limit independent riding after dark.

> "It can take quite a long time [to unlock] and sometimes you can feel a little bit unsafe when it's dark or you're in quite an isolated spot, kind of stood on the roadside." (Focus Group 4, Regular rider Group, Fairly regularly)

- Those who had never ridden generally characterised e-scooter riders as being young and male. Often they did not want to be among a perceived minority of women riders, or engage in what they

viewed primarily as a transgressive activity.

- "It needs to be a scenario like someone commuting to work, something I can relate to. The only time I think I see people using them is for fun, playing around with their mates or getting up to no good. Those aren't scenarios that attract me." (Focus Group 1, Non-rider Group, Never ridden)

Recommendations

An overarching recommendation is for the micromobility sector as a whole to become active in its efforts to end violence towards women and girls, working with national and local governments and partner agencies to challenge cultures of acceptance. Alongside this, local authority and micromobility operator staffing and decision-making must strive to better represent the diverse communities they serve.

These overarching recommendations have relevance for each of the ten recommendations below, based on specific findings and devised in consultation with the Gender Equity Commission.

1. Government(s) should provide clarity and certainty over laws around both shared and private e-scooters.
2. Local authorities should provide clear, positive communications about the status of shared e-scooters in their regions and which providers are available.
3. Local authorities and e-scooter operators should foster the development of social infrastructure to support the safe uptake of shared e-scooter riding, such as peer-to-peer support.
4. Local authorities and e-scooter operators should offer more openly accessible, public training sessions for shared e-scooters in trial areas.
5. E-scooter operators should consider an inclusive design approach to e-scooters and shared services that better accommodate different potential riders' needs and use-cases.
6. Local authorities and e-scooter operators should collaborate to ensure women's transport needs and experiences inform the development of e-scooter regulation and services in specific areas, particularly the location of parking docks and development of infrastructure.
7. Local authorities and e-scooter operators should collaborate to ensure local environments and cultures support night-time safety for women, for example, ensuring public spaces are sufficiently lit, and providing bystander awareness and education to help prevent violence and harassment of women and girls.
8. Local and national governments should place the development of infrastructure and reallocation of road-space in our cities at the heart of their mobility frameworks, and at the top of their wider transport, environmental and public health agendas.
9. A 'gold standard' for ridership monitoring should be established, and adhered to by local government, national government and e-scooter operators.
10. E-scooter operators should report gender disaggregated annual ridership figures, including the gender gap.

1.2 Summary of findings

Perceived benefits and disadvantages of riding shared e-scooters

While convenience was highlighted as a crucial perk, e-scooters were seen as inappropriate for uses and journeys more likely to be taken by women. Nonetheless, there is a plurality of differing views on the same issues, highlighting the need to understand the disparate needs and perspectives of all women.

- Varying aspects of convenience were cited as the most beneficial aspect of riding e-scooters, for instance speed, ability to ride spontaneously, or their ease of use.
- Certain contexts and preferences are more likely to affect women mitigated against convenience in many instances, including while caregiving or wearing more 'feminine' clothing.
- Many participants saw carrying additional safety equipment, such as a helmet or additional lights, as necessary but inconvenient – while riders who opted not to, identified a trade-off between safety and convenience.
- Decisions to ride e-scooters would be assessed on perception of risk to personal safety after dark. Perspectives of the safety merits of riding e-scooters at night, versus walking, differed – some felt it 'faster' and safer than alternatives, others saw it as more exposing to danger.

Perceptions of shared e-scooter riders

Non-riders' perceptions of who, why and how people ride helped inform their thoughts around e-scoot-

ers, with those identifying with riders they saw more likely to ride them, while those considering riding the domain of 'others' less likely. For non-riders, the nature of others' riding (i.e. responsible versus transgressive) was the key factor shaping perceptions and determining what 'legitimate' service use would look like.

- Positive perceptions of e-scooter riders included the perception that they were keeping others safe (identified by respectful riding or helmet-wearing) or they had a 'legitimate' trip purpose associated with a clear social value e.g. a young professional commuter, or a parent with children.
- Riders were commonly negatively characterised as young men riding transgressively.
- Negative perceptions of how people ride (i.e. transgressively or anti-socially) was often enough for non-riders to de-legitimise the perceived trip purpose, or fail to consider it altogether. Experiences of being a pedestrian contributed heavily to forming perceptions of e-scooters as transgressive.
- Non-riders often did not recognise the leisure value of riding and considered leisure to be a less legitimate reason for riding than functional reasons. Indeed, perceived leisure riding was often associated with antisocial riding. But this meant many failed to view shared e-scooter riding as an enjoyable way to make a functional journey, something reported by riders.
- There was an indication throughout the focus groups that non-riders conflated private and shared e-scooters. 92% of irregular and 99% of regular riders said they could tell the difference, whereas this figure was just 59% for non-riders.

Knowledge and understanding

Knowing how to access services, understanding the regulations, and being confident in how to ride e-scooters are key factors determining ridership. There was a perception of an information vacuum and lack of official endorsement by government (contrasted with other transport modes and bicycle hire schemes). Better communication and social infrastructure are key to overcoming some of these barriers.

- Many non-riders said they feel overwhelmed when multiple operators exist in one region, and lack confidence in how or where to start riding. Many felt local authorities and operators have failed to communicate with the public about these schemes, leaving this information vacuum to be filled with, often negative, media reports.
- Many non-riders expressed feeling bewildered at the laws and rules of e-scooter riding, particularly lacking confidence in their knowledge of where they are allowed to be ridden. Many described a fear of being unknowingly caught-out in the 'wrong' place at the 'wrong' time.
- Many non-riders express uncertainty about how they could go about learning how to ride e-scooters, through fear of attempting to do so independently. Dedicated training sessions in a controlled environment were viewed as invaluable. Many said local authorities had a role to play in training, and building trust in local operators by providing official endorsement.
- Riders often reported learning and gaining confidence from their peers, in a social setting. 63% of all survey respondents said they would or did first ride e-scooters with someone they know. Riders described having to be persistent and committed to riding, despite nerve-wracking or scary experiences.

Service design

Various features of the service excluded some or reduced others' confidence in use, particularly at night-time, including poorly located docking stations, technological issues and even road safety features, while aspects of e-scooter design were considered to exclude women.

- Riders making new journeys described a fear of docking locations being unavailable or inaccessible, and of not being able to find a scooter (or alternative option) for the return leg of a journey.
- The quality of docking stations were viewed as problematic in some instances, regardless of geographical convenience, for instance, concerns over physical accessibility and night-time safety, given poorly lit, low visibility or 'exposed' locations.
- Technological issues – such as poor signal, a slow phone, low battery, bugs in the app or finding a working scooter – were found to reduce confidence in the service among riders, shaping the way people use the service.
- Features designed to improve safety of riders and other members of the public – such as speed restrictions, slow zones and non-operation hours – were viewed as creating safety issues for women in certain situations, particularly at night when scooters are de-powered.
- The physical design of e-scooters was often viewed

as not catering for the needs of women and other groups. Reasons included the perceived inability to safely carry a bag that is not a rucksack and the weight of e-scooters making them difficult to move manually.

Perceptions of infrastructure

Infrastructure was cited as a key factor, heavily informing ridership. The carriageway was considered unsafe due to road danger and driver attitudes, while protected cycle lanes were generally considered too sparse and sometimes unsuitable.

- Over three-quarters of all survey respondents (79%) felt that not feeling safe on roads due to traffic and a lack of infrastructure was a barrier to not using shared e-scooters (more).
- Across all ridership groups, women perceived a lack of appropriate space to ride e-scooters safely and comfortably. The carriageway was generalised as unsafe and drivers seen as unwelcoming, if not hostile, particularly towards women on e-scooters.
- Participants said drivers should be educated on e-scooters and pointed to the dual responsibility of government(s) and operators to communicate with the public.
- Some participants perceived existing protected cycle lanes as unsuitable for e-scooters in their current form – be that due to space-sharing or surface quality – or to being designed primarily for bicycles.
- Suitable segregated spaces were viewed as especially critical for first-time riding. Non-riders surveyed mostly identified parks as their preferred location for first-time riding, but this was evidently not a viable option for first-time riders who most commonly reported riding for the first time on roads, possibly reflecting restrictions on riding in parks.

2. Introduction

2.1 Context

Shared e-scooters are a new mobility option that could help provide better mobility for all. When replacing car travel or supporting car-free lifestyles, they can aid in reducing congestion, improving air quality and lowering CO_2 emissions. But a pattern of gender imbalance is emerging in the ridership of shared e-scooters. In Paris, for instance, 6t found that two thirds (66%) of dockless e-scooter riders were male.[1] This gendered dimension of ridership echoes long-existing trends in the other areas of transport, such as with cycling and walking.[2]

It is vital for all people to be able to benefit from better, more sustainable mobility – both new and old. And addressing equity issues in shared e-scooters at this early stage will provide lessons and help address broader inequities in transport and the public realm.

At the time of writing, UK e-scooter regulations are in limbo. Shared e-scooters are publicly available in certain trial areas in England only, but their long-term future remains uncertain. The Department for Transport intends to publish an evaluation of those trials in late 2022. Privately owned e-scooters can be sold legally, but are currently illegal on public highways, with many organisations urging the Government to take action on private e-scooter ridership – through regulation or otherwise – as a matter of urgency.[3]
Deeper insight into the emerging gender disparity in shared e-scooter ridership is vital to inform policy-makers at national and local levels, as well as shared e-scooter operators, about how to ensure policy and operational design helps achieve greater equity.

2.2 About this report

The purpose of this research was to provide insight into why a gender imbalance exists in shared e-scooter ridership, and offer solutions to the problem of inequity to inform decision-making at a local and national level by governments and e-scooter operators alike.

There is a paucity of existing literature exploring the gender imbalance in shared e-scooter ridership, particularly in Europe, and even more so in the UK. Although the overlaps with cycling have become steadily apparent, e-scooters should be considered separately and warrant distinctive research.[4] Promisingly, this is beginning to happen.[5] This report will add depth to this nascent field of research.

A number of reports have emerged recently offering frameworks of how equity in (micro)mobility can be reached.[6] The current project has been informed by the paper published by French organisation 6t, Micromobility for All. Our research focuses on two of their three pillars of enhancing equity in e-scooter ridership: accessibility (equitable access to services) and capability (equitable capability to use services). We considered our methodological approach in itself a constituent element of the third pillar cited by 6t – 'mobility justice', or the equitable ability of all to shape policy and services.

1 *6t (2021) Micromobility for All. A roadmap towards inclusive micromobility: Intermediate report*
2 *Sustrans (2018) Inclusive City Cycling – Women: Reducing the gender gap*
3 *PACTS (2022) The Safety of Private E-scooters in the UK*
4 *Full literature review of micromobility in 6t (2021) Micromobility for All. A roadmap towards inclusive micromobility: Intermediate report*
5 *Tier (2022), How making micromobility safer for women can achieve safer cities for everyone*
6 *See: 6t (2021) Micromobility for All; Arup & Urban Transport Group (2022) Equitable Future Mobility: Ensuring a just transition to net zero transport; ITF (2021) Micromobility, Equity and Sustainability: Summary and Conclusions, ITF Roundtable Reports, No. 185*

3. Research aims and methods

3.1 Research aims

The specific research objectives were to:

- Better understand women's perspectives and understandings of shared e-scooters, including issues, challenges and barriers to riding
- Understand how those perspectives differ across rider groups
- Understand how those perspectives inform ridership
- Identify possible solutions to perceived issues, challenges and barriers

3.2 Methods

Data was collected in two ways: a series of virtual focus groups and an online survey. For both methods, participants were recruited via email and social media promotion. Emails were delivered to the Women in Transport professional network and to a group of Voi riders who had opted to receive information about research projects. Social media posts were also shared by both organisations, as well as the organisation conducting the research, JFG Communications.

Participants were screened according to how often, if at all, they rode e-scooters. For logistical and analytical purposes, these subcategories were grouped into three broader groups: Non-riders, Irregular riders, and Regular riders. See Table 1.

Table 1: *Ridership groupings*

Ridership frequency	Grouping
Never	Non-rider
Once	Irregular rider
A few times	
About once a month	Regular rider
Fairly regularly (every week or most weeks)	
Very regularly (several times per week)	
Every day	

The final stage of the project was the formation of a Gender Equity Commission of experts, whom researchers consulted to devise recommendations based on the research findings.

Focus groups

Five focus groups lasting one hour each were held on Microsoft Teams during November 2021. Two focus groups were comprised of Non-riders, one of Irregular riders, one of Regular riders and a mixed group. 31 participants in total took part.

Survey

499 valid survey responses were received to a survey of 40 closed answer questions and one open answer question.

Table 2: *Survey respondent rider groupings collapsed*

Frequency	Frequency	Percent
Never ridden	56	11.2
Irregular riders	255	51.1
Regular riders	188	37.7
Total	499	100

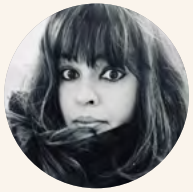
Gender Equity Commission

The Commission was assembled to help devise recommendations based on the findings of the focus groups and survey. These recommendations are featured throughout the report. Commission members were experts drawn from a range of relevant fields and comprised of:

Sonya Byers
CEO of Women in Transport (Chair)

Hira Ali
Author, Executive Leadership and Career Coach, Campaigner for gender and racial equality

Dr Leslie Kern
Associate Professor of Geography and Environment and Director of Women's and Gender Studies at Mount Allison University, Canada



Jazmin Burgess
Deputy Director of the Inclusive Climate Action programme at C40 Cities

Ellie Wooldridge
Human Insights Team Lead at Connected Places Catapult

Bronwen Thornton
CEO of Walk21 Foundation

Ruth White
Team Manager, Place, Environment and Heritage, Edinburgh City Council

Sandra Witzel
CMO and Board Director, SkedGo

Wei-Shiuen Ng
Advisor on Sustainable Transport and Global Outreach for the International Transport Forum (ITF)

Christine Hemphill
Founder and Managing Director of Open Inclusion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4. Findings

WE PRESENT THE findings from the focus groups and survey thematically, outlining perceptions and exploring how these perceptions inform ridership. In the first section we consider what are perceived to be the benefits and disadvantages of shared e-scooters. 4.2 looks at participants' perceptions of who, why and how shared e-scooters are being ridden. In the third section, we discuss participants' knowledge and understanding of shared e-scooter services, surrounding regulations and how to ride an e-scooter. 4.4 explores different aspects of service design, from docking locations and slow zones to the physical design of the scooters. Finally, we discuss participants' perceptions of infrastructure and the built environment.

The recommendations produced by the research team in consultation with the Commission feature at the end of their relevant sections throughout the report.

4.1 Perceived benefits and disadvantages of riding shared e-scooters

This section looks at how the participants perceived the benefits and disadvantages of riding shared e-scooters. While convenience was perceived as the chief benefit of riding shared e-scooters, other benefits were cited including cost and safety. Nonetheless, many factors were thought to mitigate against convenience in certain contexts – for instance, while escorting or caring for children, or wearing 'feminine' clothing. Other benefits were similarly viewed in a different light depending on context and personal viewpoint.

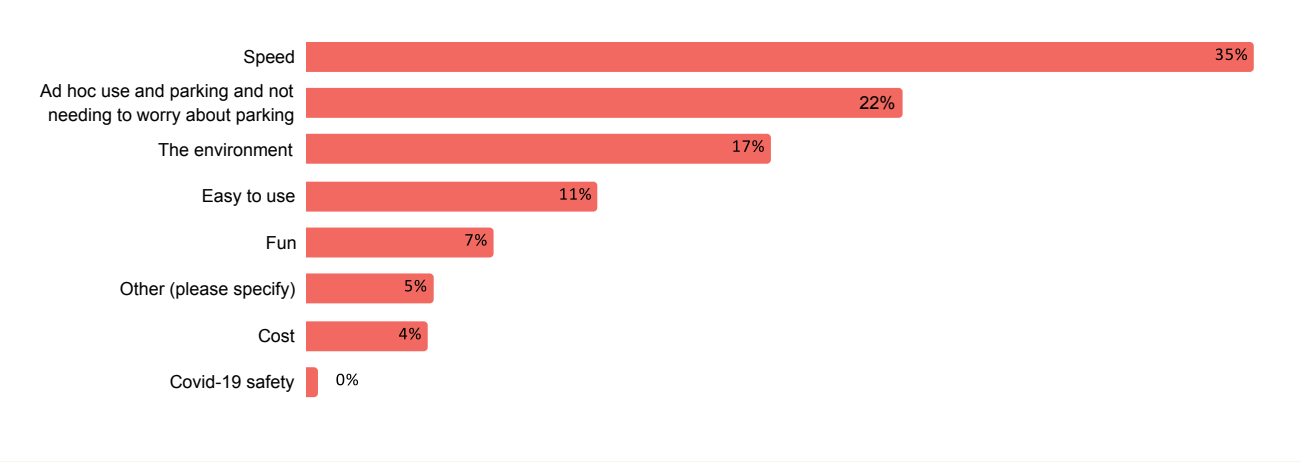
These findings reveal how e-scooters are viewed and can be seen as inappropriate in certain contexts and likely to affect women. Nonetheless, there is a plurality of differing views on the same issues, highlighting the importance of operators and regulators approaching gender equity with a view to better understanding the disparate needs and perspectives of women.

Quick, convenient and easy, but only sometimes

Varying aspects of convenience were cited as the most beneficial aspect of riding e-scooters during focus groups, for instance speed, ability to ride spontaneously, or the ease of use of the service – echoed in the survey.

Nonetheless, shared e-scooters were viewed as inconvenient in many scenarios. For example, women are more likely than men to occupy a caregiving role and participants saw e-scooters as being impractical for the related journeys, such as escorting children or carrying shopping. Participants also said e-scooters were

Figure 1: *Perceived main benefits of shared e-scooters (% All respondents)*



not designed to be ridden in certain items of clothing more likely to be worn by women.

- “It goes back to practicalities, because taking young children to school with bags and PE kits alongside using an e-scooter is just not that practical for me.” (Focus Group 1, Non-rider Group, Never ridden)
- “Shoe wise I would feel unsafe if I was in heels. You would want to have trainers or something, a fairly decent shoe so you could put your foot down on the ground if you needed to stop. There's a lot of factors that would prohibit me from even considering it as an option.” (Focus Group 1, Non-rider Group, Never ridden)
- "Sometimes going on an e-scooter, if I want to wear a dress, it's not really that practical... I will have to take a pair of shorts or something." (Focus Group 5, Mixed rider Group, Fairly regularly)

This connects to the view shared by many participants – particularly non-riders – that they would need to make adequate personal preparations in order to ride e-scooters, such as changing outfit or carrying personal safety equipment, that would then reduce the convenience of using an e-scooter service. Indeed, there was a shared sense by many non-riders and some riders of having to take personal responsibility for one’s safety rather than trusting operators to supply what is appropriate. Some riders suggested they had to make a trade-off between safety and convenience.

- “There's a lot of personal safety concerns that I think are a huge risk without having helmets, proper lights, whether or not you wear high vis in certain situations.” (Focus Group 1, Non-rider Group, Never ridden)
- “For me, the whole point of me using a scooter is the convenience of it. The ability to hop on, hop off. I'm going to use it to go to the pub and things like that. I don't want to be carrying around a helmet. I know obviously how it would be a good safety precaution, but it would be too inconvenient to carry a helmet.” (Focus Group 4, Regular rider Group, Fairly regularly)

Of the overall survey sample (all rider types), 65% felt that a barrier to using shared e-scooters was not wanting to carry personal safety equipment, while 25% disagreed.

Weather also plays a role in shaping women’s views of when it is appropriate to ride an e-scooter. Where a main benefit of shared e-scooters is the ability to ride them spontaneously or ad hoc, evidently riders are unlikely to prepare for changes in weather in the same way regular cycling, walking or driving commuters might do:

- “I suppose the only other time I might not use it as like if the weather is not that great. If it is really cold or really wet, I probably would avoid it. But otherwise, I'd use it quite often.” (Focus Group 4, Regular rider Group, Fairly regularly)

E-scooters can enhance personal safety, but also feelings of vulnerability

It should be noted that, like walking, cycling or taking public transport, e-scooters were considered inherently vulnerable to victimisation for women. It is well understood that women use a variety of methods to manage risk to their personal safety after dark, such as avoiding a particular route, place or mode of travel. Decisions to ride e-scooters would be assessed based on the perception of risk to personal safety. Some said being faster than walking pace meant it was a reasonable way to travel at night, while others said their relatively low speed (compared to cycling or driving) made them feel vulnerable. For example,

- “I think a big benefit I’ve found about them as a woman is as a safe mode of transport home, so it’s a good way of getting home that I can afford as opposed to an Uber or something, 'cause at Liverpool at the moment you can't really walk anywhere at night on your own. So like getting to the gym and things, it’s definitely like a good, safe mode of transport.” (Focus Group 3, Irregular rider Group, A few times)
- “I think my main thing is the safety in terms of especially at night, feeling really exposed being on a scooter, like I said before. So although you can go a fair speed, if there's someone who's on a bicycle, who can cycle really fast or someone in a car and you're on your own, not from a collision point of view, just from being quite exposed to potentially being attacked or something. It's something that I often have in my mind.” (Focus Group 4, Regular rider Group, Fairly regularly)

Many of these views were contextualised with experiences that depended on other factors, such as the location of docking, the busyness of streets, the impact of slow zones, or the reliability of the scooter or app,

which are discussed in 4.4. When asked to comment on their confidence in hiring an e-scooter, 90% of overall survey respondents agreed (strongly) that they were confident to do so in the day-time, compared to 64% saying they (would) feel confident at night time.

Alternative to public transport during the pandemic
One perceived personal safety benefit of e-scooters was their ability to function as an alternative to crowded public transport during the Covid-19 pandemic.

- "It made me feel safer not having to share the tube or the bus with a number of people." (Focus Group 3, Irregular rider Group, Once)
- "We couldn't have too many people on buses because of corona so it was a way of keeping people off the buses and yet not being in cars polluting." (Focus Group 2, Non-user Group, Never ridden)

Contrasting views on physical activity – whether travelling for health or to avoid effort
Similarly, there were contrasting views on the merits of e-scooters regarding physical activity. For some, it was a helpful way of avoiding exertion, particularly when compared to cycling or walking. However, others felt the lack of physical activity was a downside.

- "I first used them with my partner. We just popped into town. It was quite a hot day so we didn't want to walk all the way." (Focus Group 5, Mixed group, Fairly regularly)
- "I kind of thought why am I ever going to cycle to work and get all hot and sweaty from all the hills ever again." (Focus Group 4, Regular rider group, Fairly regularly)
- "I don't want to get on a scooter or a taxi or whatever because I want the exercise." (Focus Group 1, Never ridden, Non-rider)

Cost
The relative cost of a shared e-scooter versus alternatives is likely to be highly context dependent. Some participants reported the financial benefits of e-scooter riding particularly when compared to private cars of buses, for instance:

- "If people don't have access to a car or they can't afford to use the bus 'cause bus passes are quite expensive, [shared e-scooters are] another way for them to be able to get out and about." (Focus Group 1, Non-rider Group, Never ridden)
- "By the time you park [your car], the cost of that actually you offset all of that, and I think it's just a lot more economical to do it on the scooter. So I may take out a day pass and use it then and just zoom around and it's great, providing there's the availability there." (Focus Group 5, Mixed Group, Fairly regularly)

However, nearly half (45%) of the overall survey respondents felt that shared e-scooters are expensive and this is a barrier to using them (more). 41% did not think this is a barrier. 14% neither agreed nor disagreed with this. The mixed views in the survey likely reflect the variety of instances and places in which e-scooters are used and the participant's relative budgets. Future research could consider exploring cost across different socio-economic groups, locations and views on differential charges (for example, concessions or discounts for certain riders, trips or times of day).

4.2 Perceptions of shared e-scooter riders

This section is framed around the positive and negative perceptions of riders held by non-riders. As well as (non)identification with riders' personal characteristics (e.g. age, gender) these positive or negative perceptions of why and how people ride fed into an overall idea of what constitutes 'legitimate' or 'illegitimate' reasons and ways of riding, setting the parameters of if and how non-riders might consider riding.

Across rider groups, those who identified more with the people they saw riding e-scooters were more likely to ride e-scooters. Conversely, those who saw e-scooters as being predominantly the domain of 'others' – whether being ridden by people not perceived to be like them, not riding for the same reasons they would, or being ridden transgressively – were less likely to ride them. For non-riders, the nature of others' riding (i.e. responsible or transgressive) was the key factor shaping perceptions and determining what 'legitimate' service use might look like.

Without intervention from operators and policy-makers, a lack of suitable, identifiable role models risks the perpetuation of these emerging trends of ridership.

4.2.1 Positive

Helmet wearing and rule-abiding
Positive perceptions of how e-scooters were ridden

were primarily associated with safety. Not only did this mean following the rules of the road, but perceived legitimate riding was closely equated with helmet wearing – people taking adequate safety precautions for themselves were more likely to be viewed as respectful road users. This perception was reflected by riders themselves, one of whom said they expected helmet-wearing to be a signal to other road users that they are a responsible rider.

- "I've seen other people who have their own private ones who ride on the road and follow the rules and wear helmets and all that kind of good stuff, but I find with these trials people are just... It's a bit of a Wild West scenario." (Focus Group 2, Non-rider Group, Never ridden)
- "But I think [e-scooters are a good thing] certainly when people are sensible on them – I see a lot of people wearing helmets and things as well on them which is good." (Focus Group 4, Regular Group, Fairly regularly)
- "I've got [a] helmet on and I'm doing all the right things, and I'm having grown men and people from trucks and things just shouting at me." (Focus Group 5, Mixed Group, Very regularly)

Professionals with purpose

Other positive perceptions of riders were connected to the perceived purpose of their trips, e.g. a young professional commuter, or a student getting from A to B. This was particularly true for non-riders, with those perceived as legitimate riders perceived to have readily recognisable social roles. In turn, these perceptions of legitimate travel – commuting, A to B travel – informed the ways in which non-riders might see themselves riding.

- "Those are the types of people that I've seen on them. Students, people who work." (Focus Group 2, Non-rider Group, Never ridden)
- "I think the other group is professionals. Particularly people who are like moving in the city during rush hour as a form of trip chaining." (Focus Group 2, Non-rider Group, Never ridden)
- "I would use an electric scooter as a sort of last mile bit of my journey. So probably between home and the train station." (Focus Group 1, Non-rider Group, Never ridden)

4.2.2 Negative

Non-identification

Perceptions of who rides e-scooters were fairly similar across all five focus groups – riders were characterised as young men. For instance,

- "I think here it's even younger than 50. I'd say most of it is under 35s." (Focus Group 2, Non-rider Group, Never ridden)
- "I can see that people that tend to use the scooters, it does look to be mainly male and I would say it's mainly people in their 30s and below." (Focus Group 3, Irregular rider Group, A few times)

For some non-riders, their inability to identify with riders created a barrier to riding. But many implied they could be encouraged to try e-scooters if they saw role models they identified with.

- "It's more than seeing women in adverts using them, it's women on the street using them as well... because I just feel like I don't want to be the first [woman] to do it. (Focus Group 1, Non-rider Group, Never)
- "It doesn't make much difference if it's men or women, but I would want it to be grownups rather than kids." (Focus Group 1, Non-rider Group, Never)

The proportion who agreed that 'they see people like me' riding e-scooters rose from 27% among those who had never ridden one, to 70% among regular riders.

Leisure means less legitimate

Non-rider focus group participants were unlikely to identify with those who they perceived to be riding e-scooters for non-functional or leisure purposes. For example:

- "It needs to be a scenario like someone commuting to work, something I can relate to. The only time I think I see people using them is for fun, playing around with their mates or getting up to no good. Those aren't scenarios that attract me." (Focus Group 1, Non-rider Group, Never ridden)

Indeed, many non-riders' disregard of the leisure value of e-scooters meant they often failed to recognise that a functional trip could also double up as an enjoyable leisure activity. Many riders reported the blurring of leisure and function:

- "I use it just to get from A to B. Not commuting: it's only if I need to get to somewhere fairly local that

Figure 2: *"I see people 'like me' (in terms of e.g. gender, age) using e-scooters."*

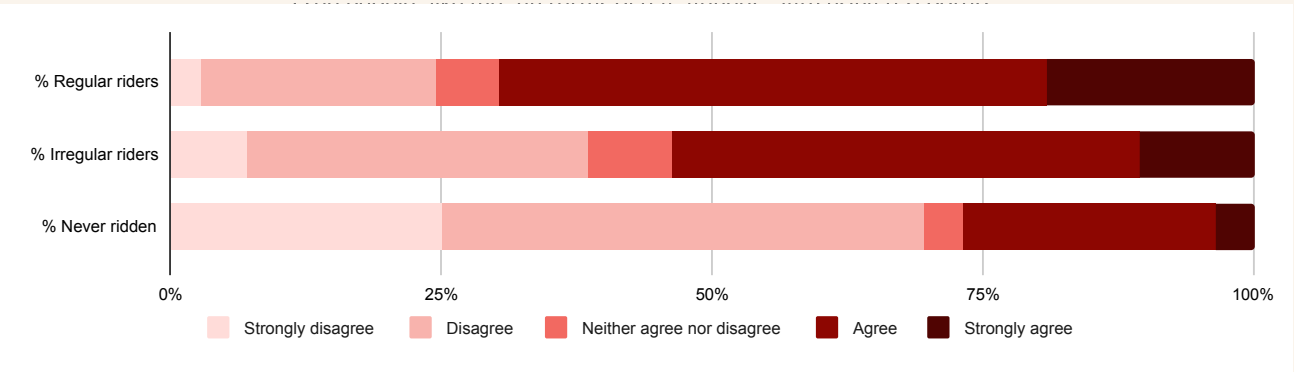
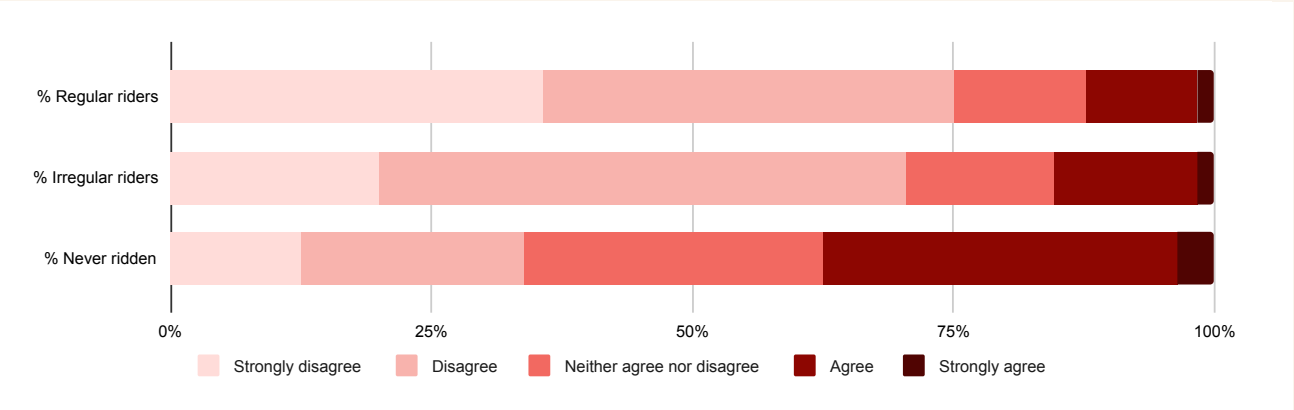


Figure 3: ***"****A barrier is the extent to which I see pople 'like me' (e.g. age, gender) using e-scooters."*



walking would be too far or take too long to do. I enjoy it so it's fun while I do it as long as I'm not in too much traffic, but my main reason is just to get from A to B." (Focus Group 3, Irregular rider Group, A few times)

- "To be honest, like most of my friends and partner use scooters. So if we're going out or meeting in town for example, it's just easier – everyone can jump on a scooter, and it's good fun as well." (Focus Group 4, Regular Group, Fairly regularly)

Transgressive riding usurps purpose

Among non-riders, the perceived nature of how others were riding was often enough to shape or de-legitimise the perceived trip purpose, or fail to consider it altogether. In particular, the line between riding for leisure and riding transgressively or without care was often perceived to be blurred, and the archetypal young male rider was often bound up with associations of transgression.

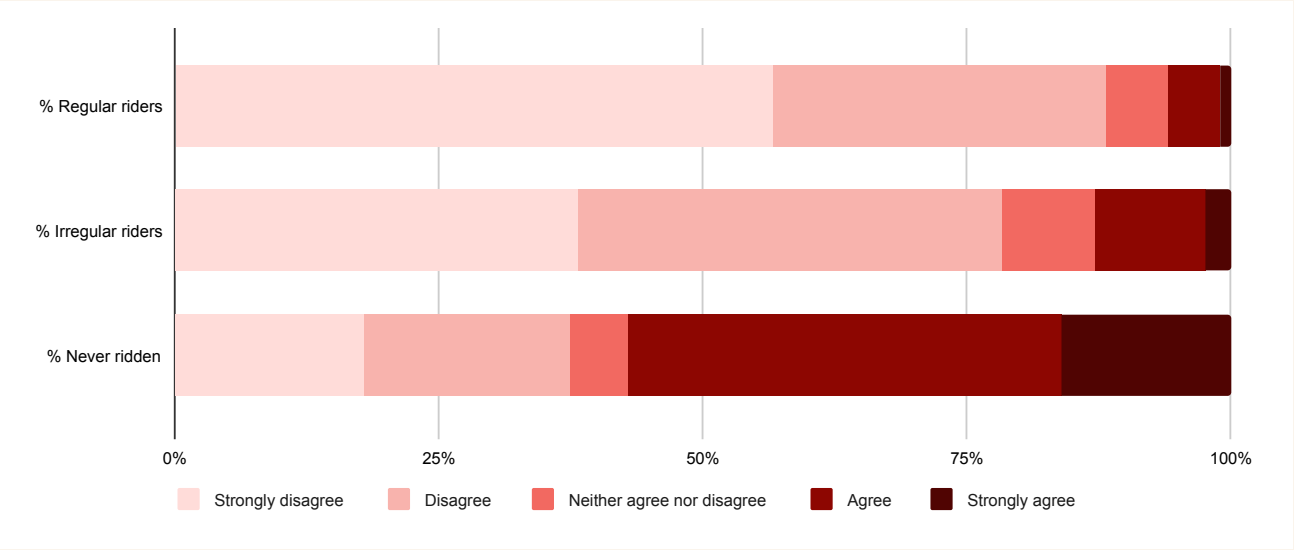
- "It does seem like the users of them are young people who are using them as a toy, rather than... you don't see people using them in the way that I am using them, so that's why I am put off ever using them." (Focus Group 1, Non-rider Group, Never ridden)
- "Young males driving around on them, potentially a bit intimidating and not really taking care of them." (Focus Group 1, Non-rider Group, Never ridden)
- "Young males with ASBOs!" (Focus Group 1, Non-rider Group, Never ridden)

Non-riders' narrower perspective of 'legitimate' riding is reflected in the survey findings. Only half (50%) of non-riders said they saw people riding e-scooters for the same reasons they would, contrasting 78% of irregular and 90% of regular riders. These focus group findings suggest this divergence reflects perceptions of how, as well as why, e-scooters are ridden.

Forming perceptions as a pedestrian

We found that experiences of being a pedestrian went a long way to forming these perceptions of e-scooter riders as transgressive, and directly contributed to some participants' hesitance to ride them. Those con-

Figure 4: *"A barrier is that I see them as a nuisance, intimidating or anti-social and don't want to be associated with that."*



sidered a public nuisance were also often associated with shirking personal safety precautions.

- "There's definitely a place outside my house that they zip by so fast on the pavement that you feel like you're going to be knocked over, and also you feel like you're going to be mugged a lot of the time, people come right up by you." (Focus Group 1, Non-rider Group, Never ridden)
- "I find them really menacing on the pavement. My perception of them is they are quite threatening... I don't want to be threatening to people." (Focus Group 1, Non-rider Group, Never ridden)
- "Not everybody follows the rules of the road and not everybody wears helmets." (Focus Group 2, Non-rider Group, Never ridden)

When asked if a barrier to riding is not wanting to be a nuisance, intimidating or anti-social, 57% of non-riders said they agreed, compared to just 13% and 6% of irregular and regular riders respectively. This demonstrates a clear dividing line between riders and non-riders when it comes to perceptions of transgressive riding, and the value placed on those perceptions.

Conflating private and shared e-scooters

Focus group participants indicated shared e-scooter riders are not entirely responsible for the negative perceptions of shared e-scooters. There was an indication throughout the focus groups that non-riders viewed 'e-scooters' as a whole – conflating private and shared. Indeed, during a focus group, one irregular rider even showed an awareness that their negative perceptions may be fuelled by those using private e-scooters, but said this did not play into their thinking:

- "I do also see a lot of people breaking traffic rules with them... going through traffic lights at cross-roads and not being very sensible on them. That's more on the non-rented ones I'd say, but I do associate [e-scooters] with people just, you know, ignoring all rules and not being very safe." (Focus Group 3, Irregular rider Group, A few times)

The survey asked participants if they could confidently tell the difference between private and shared scooters. 92% of irregular and 99% of regular riders said they could tell the difference – whereas this figure was just 59% for non-riders. Perceptions of private e-scooters (which have different regulations, accountability mechanisms, safety precautions and speeds) thus alter people's perceptions of shared e-scooters, particularly among non-riders.

New regulations, providing a clear legal framework for e-scooter ownership and use in the law, highway code and in the 'rules of the road' was seen as critical to address concerns over e-scooters as a whole.

- "Someone said earlier it's the Wild West. There's no control and there's no rules or regulation and I'm seeing a lot more of them now. Personally, I'm conscious when I'm crossing the road, because

even when it says red I still wait for the scooter to stop 'cause they don't stop. Because all of a sudden the scooters have become bikes - when the light changes to red. So they kind of go on the pavement to just kind of navigate their way through, so there's a risk there, and I think we do need laws to protect us." (Focus Group 2, Non-rider focus group, Never ridden)

4.2.3 Recommendations

1. Government(s) should provide clarity and certainty over laws around both shared and private e-scooters. The findings demonstrate a perceived lack of clear private e-scooter laws has resulted in a grey area in which women were not confident of the legality and their appropriate use. Their association with bad behaviour and transgressive riding – which seems to be associated with private e-scooters – also put many off riding shared e-scooters.

It is for the overall public benefit to properly regulate the private e-scooter market, which appears to be contributing to poor safety for riders, safety concerns for pedestrians, and negative views towards e-scooters – potentially restricting uptake. In determining appropriate regulations, an extensive equality impact assessment and wide-reaching public consultation should take place in advance of introducing regulations.

Certainty over both private and shared e-scooter status and regulation is also important to unlock resource and investment in monitoring and addressing emerging gender imbalances at a local government and operator level.

4.3 Knowledge and understanding

This section considers how knowledge and understanding of shared e-scooters informs ridership. It highlights issues resulting from a complicated legal framework, limited training opportunities and a perceived lack of official endorsement – creating a sense of bewilderment and even alienation among non-riders. This contributed to fears of being confronted for being in the 'wrong' place, on the 'wrong' scooter, or simply being put in a position of vulnerability to other road users. Riders illuminate these barriers to entry, outlining the reliance shared e-scooter trials presently have on peer support and feelings of risk-taking to overcome fears and unknowns.

4.3.1 Accessing services

Some non-riders said they were confused and overwhelmed by the multitude of operators existing in one region. Some participants were unsure of which providers were 'legal' or how or where they would start, or get information on where to start, particularly those who had not yet used any shared e-scooter service. This patchwork was compared to the supposed simplicity of authority-run or endorsed city-wide bike-sharing schemes. For example:

- "Just the downloading the app thing. I wouldn't even know what companies are doing it. I see different ones all the time, so I wouldn't even know where to start if I wanted to be proactive and get set up with it." (Focus Group 1, Non-rider Group, Never ridden)
- "With Boris Bikes you knew they were across London all the time - it felt like it was worthwhile investing the time to know how to use it... I don't know what the benefits or disadvantages of each [shared e-scooter operator] would be." (Focus Group 1, Non-rider Group, Never ridden)

Some participants suggested the arrival of shared e-scooters without sufficient engagement or communications from operators or local authorities left them confused about their status. Many said this information vacuum had been filled by the media, often reporting on incidents resulting in injury, which has contributed to negative perceptions of e-scooters as transgressive and high-risk.

- "One of the reasons they haven't worked is that there's not been much of a media campaign. With Boris Bikes, they were everywhere and everyone knew about them - all over buses and online. E-scooters have popped up and people are like 'Oh, these are a thing now'. Don't really know anything about them." (Focus Group 1, Non-rider Group, Never ridden)
- "The first time I heard about [e-scooters] was when that lady was knocked down in Battersea and that really stuck with me." (Focus Group 1, Non-rider Group, Never ridden)

When asked in the survey, the majority (54%) of non-riders agreed that a barrier to riding shared e-scooters was a lack of understanding of individual schemes and how to use them, whereas 30% of irregular riders and 22% of regular riders agreed this was a barrier to (more) use.

4.3.2 Understanding laws and regulations

In many instances, a lack of understanding of shared e-scooter services stretched to a poor understanding of the wider regulatory landscape around e-scooters as a whole, for example, where they are allowed to be ridden. For some participants, they were aware laws and regulations existed, but were not confident in their knowledge of them and felt a sense of bewilderment towards e-scooters as a whole.

Others anticipated confrontation with road users, reflecting issues deriving from perceived infrastructural shortcomings (see 4.5).

- "I genuinely don't know what the rules and regulations are... It's very confusing for everyone I feel if you have different rules for rental and non-rental ones. Like bikes – they're allowed where they're allowed, I would find it very confusing if there were different rules for different types." (Focus Group 1, Non-rider Group, Never ridden)
- "Having cycled in London for quite a while, I don't know if this is the same for everyone, but you get challenged a lot, saying 'you shouldn't be here' or commenting on your cycling. So that's a fear for me, because if I don't know exactly what I should and shouldn't be doing I don't want to get involved in it because I can't defend my position. At least when I was cycling I could say I have absolutely the right to be in the road... with e-scooters I don't have the knowledge that it would give me the confidence to support this." (Focus Group 1, Non-rider Group, Never ridden)

Indeed, results from the survey indicate that 54% of non-rider participants said understanding of laws and regulations surrounding e-scooters was a barrier to (more) e-scooter riding, compared to 23% and 19% of irregular and regular riders respectively. The sizeable minorities from regular and irregular riders nonetheless illustrate that many riders ride despite carrying uncertainty over regulations.

4.3.3 Learning to ride

Riders and non-riders alike described feeling uncertain about how to ride e-scooters or lacking confidence in their abilities, despite riding them. A lack of suitable spaces for practice or training was cited as a key limiting factor, while social learning and persistence were posited as ways of overcoming uncertainty.

A lack of spaces to learn and 'practise'

Many non-riders expressed a lack of confidence in being able to ride e-scooters – they were quick to point out their fear of personal injury and embarrassment. This was often expressed in a need for training or practice sessions in a dedicated 'safe' setting. A further reflection of the common perception that inadequate spaces or infrastructure exist to encourage independent first-time riding (see 4.5). Knowledge-based and practical challenges were suggested to help overcome a lack of confidence, e.g. through formal training.

- "It would have to be in a controlled environment like a park. Where I can just embarrass myself without breaking my neck. It's never gonna be on the road. That's no good. I'm probably more terrified of doing that, but in a controlled environment, yes." (Focus Group 2, Non-rider Group, Never ridden)
- "A lot of the barriers that we are coming up with could be covered in training schemes – how you ride them, laws about where you can ride them, how you dock them, how you pay for them, how to use the app. It would overcome a lot of people's initial inertia to using them if there was a training course you could go on before you used one." (Focus Group 1, Non-rider Group, Never ridden)

Many non-riders also said that local authorities should play more of a visible role promoting schemes and training programmes. Many focus group participants showed concern over e-scooter companies being chiefly responsible for training, safety and accessibility of services – the apparent absence of local authorities suggesting they were not for the greater good of the local area.

- "I think they are quite focused on active people who are quite confident, because if they weren't there would be more training sessions beforehand offered by the local councils. So they do seem to be quite particular for a certain group that might not be the majority." (Focus Group 1, Non-riders, Never ridden)

Peer support

People who ride shared e-scooters said a lack of formal training opportunities were often overcome by learning or gaining confidence from their peers in a social setting. Informal training and peer-led support appears key to building confidence in using the service and one's riding ability.

- "The first time I used one, I was with my boyfriend...I think the thing that would have put me off using it on my own anytime of the day for the first time was knowing what to do with the app. I like tech, I think I'm quite good at it, I just think there's something about standing on the side of the road on your own with your phone - it feels a bit awkward." (Focus Group 4, Regular rider Group, Fairly regularly)
- "I do remember my first time because it was my sister who insisted about 20 minutes that we should use a scooter and I said no, I was thinking of different options and then she said, it's fine, it's safe – I will ride ahead of you. And then I said, fine I'm happy to give it a try, especially that she knew a quieter route." (Focus Group 3, Irregular rider Group, Once)

Indeed, the majority of survey respondents (63%) said they would or did first ride e-scooters with someone they know, with 34% saying this was or would be alone. This highlights the clear role of peer support in taking the risk of riding for the first time, which may be more important for women who are more likely to hold higher perceptions of risk than men.[8]

Persistent risk taking

The notion that one needed to be persistent, to continue embracing the unknown even after one's initial riding experience, was a theme that transpired among riders of various ridership levels. Many riders said that pushing out of their comfort zone and persevering enabled their confidence to grow.

- "The first time was a little bit kind of scary... you almost didn't realise how fast it would feel when it kind of pulls off initially, but I think after a minute or two you get used to it." (Focus Group 4, Regular rider Group, Fairly regularly)
- "You definitely have to get used to it. I've only done it like the one time and when I first did it, we probably used it like maybe three or four times in one day and by the end it was fine, but I would not have wanted to go on the road. I think I would have felt much safer on wide sidewalks or dedicated cycle lanes or something, but the first time it was, it was... you definitely feel like you're going too fast." (Focus Group 5, Mixed rider Group, Once)

Indeed, some riders felt manoeuvring e-scooters was a hard skill to learn and they were still 'getting used to it' – further enhancing the sense of risk. Even those who had ridden e-scooters multiple times mentioned there are still elements of riding they are not fully confident with:

- "Think it was really fun most of all, but the change in speed, the acceleration, can be quite scary if you don't know how to balance yourself." (Focus Group 4, Regular rider Group, Every day)
- "The massive challenge for me, which still exists to this day, is turning around corners. I'm not great at it, and I'm learning to lean into it more." (Focus Group 3, Irregular rider Group, A few times)

This highlights how judgements about risk are constant and moments of discomfort or fear can lead people to stop using e-scooters. Participants suggested this would put off more vulnerable people or those with a high perception of risk.

- "I don't think they are, they never would be [accessible] – whether you have a disability or you're from an older generation or you're quite timid in yourself. I think [e-scooters] are quite focused on active people who are quite confident." (Focus Group 1, Non-rider Group, Never ridden)

Throughout each rider's journey of empowerment there are moments of friction that have to be overcome. From learning to use the app and riding for the first time, through to persevering through hardship. These reinforce the need for safe environments in which to learn, practise and simply ride, as well as greater opportunities or incentives for peer-to-peer support, and clear and authoritative communications from operators and local authorities about the status of shared e-scooters and the available providers.

4.3.4 Recommendations

2. Local authorities should provide clear, positive communications about the status of shared e-scooters in their regions and which providers are available.

A perceived lack of clarity about the status of e-scooters led to the perception that riders would be caught out, harassed or penalised for being on the wrong scooter in the wrong place. Participants felt uncertain about which providers were legal, nor supported by

[8] *Prati, G, Fraboni, F, De Angelis, M, Pietrantoni, L, Johnson, D, and Shired, J. (2019) Gender differences in cycling patterns and attitudes towards cycling in a sample of European regular cyclists. Journal of Transport Geography, 78. pp. 1-7*

their local or national government, heightening the risk of unknowingly breaking the law, or being perceived by others to be breaking the law.

As well as giving people confidence to ride, positive, coherent communications efforts may also serve to improve driver etiquette towards e-scooters. It will also help neutralise the more negative stories about e-scooters that have tended to fill local information vacuums.

3. Local authorities and e-scooter operators should foster the development of social infrastructure to support the safe uptake of shared e-scooter riding, such as peer-to-peer support.

These findings suggest women are more likely to try riding a shared e-scooter for the first time when with the encouragement and support of a peer who had previously ridden one, rather than trying it alone. Such initiatives may include establishing incentivised peer-to-peer (women-to-women) learning programmes; collaborating with existing community groups to offer peer-led training; adding e-scooter training into school road safety training programmes; offering specific incentives and opportunities for women and girls to participate, perhaps in groups.

4. Local authorities and e-scooter operators should offer more openly accessible, public training sessions for shared e-scooters in trial areas.

These findings suggest peer-to-peer learning or officially provided training is key for people to start riding e-scooters. In addition to the physical act of riding, these also equip would-be riders with knowledge of the law.

Structured training sessions for women, led by operators but endorsed by local authorities would also help build trust in services and operators, as well as one's own knowledge.

4.4 Service design

This section considers the barriers stemming from perceived issues with the design of shared e-scooter services. This includes many of the features that are essential for a shared system, such as docking locations, smartphone apps as well as the controls often required by the local authority, such as geo-fenced restrictions on where e-scooters can go or restrictions to their speed or power in certain locations. This section also includes perceptions of the physical e-scooter itself, which vary between providers, but broadly share a common design.

For non-riders, the perceived practical issues with the design of specific services were often secondary to more general and theoretical issues with e-scooters, regardless of whether they were shared or private (see 4.2). However, for the riders, negative perceptions of aspects of the service added limitations on how and where they might further use e-scooter services.

4.4.1 Service features

Various features of the service excluded some or reduced others' confidence in using the service, including poorly located docking stations, technological issues and even road safety features.

Docking locations

Access to docking locations is a prerequisite of being able to use the service. Like other fixed public transport, regular or everyday riders reported having reliable access to stations at the start and end of their regular journeys.

- "I have one of the [docking] stations just in front of my flat. So I just go there. I take one and just go for 18 minutes, 'cause the good thing is that you don't have to wait for buses." (Focus Group 4, Regular riders, Everyday)

In contrast, ad hoc riders described their fears of being unable to find a station:

- "I worry that you're gonna get stranded like if you've taken the scooter a fair distance away from somewhere and someone else picks that scooter up while you're inside." (Focus Group 3, Irregular Group, A few times)
- "It's not necessarily something you can guarantee will be convenient at the other end." (Focus Group 3, Irregular Group, A few times)

Our survey found a significant proportion – notably similar across rider groups – thought docking locations were a barrier to riding. When asked to respond to the statement 'A barrier is the parking docks are poorly located in terms of usefulness', 41% of those who had never ridden shared e-scooters, 44% of irregular riders and 39% of regular riders (strongly) agreed this was a barrier.

Certain docking locations were viewed as problematic. Even when there was widespread geographical availability, issues around the quality of stations emerged. This included their physical accessibility and sense of personal safety, particularly at night given

poorly lit or low visibility docking stations:

- "If the scooters are available outside the station, you still have to get down steps. I don't know how heavy they are." (Focus Group 1, Non-user Group, Never ridden)
- "One of the parking stations I usually use, it's just in the middle of grass and most of the time it is pretty dirty and you have to put your feet into the soil which is not nice, especially if you are really close to entering your office." (Focus Group 4, Regular user Group, Every day)
- "Just referring to the parking station - making sure they are quite illuminated and signalised, especially during the night they're not hidden by trees, they're not behind that corner where people could be in danger. Just that a few areas in my area there are parking stations and I would never go there and pick one at specific times of the day, especially during the winter, where it's dark at 5ish. So just making sure that they are easily reachable in the middle of the street where people can see you and what's happening, because it takes a few minutes to jump on a scooter from the station, put it on the road so it's better if someone can be the witness of you taking it safely without being behind a corner and... God knows what happens." (Focus Group 4, Regular user Group, Every day)

The issues here, though context dependent, highlight the importance of considering the quantity and quality of docking locations, in particular engaging target groups in the design of stations to ensure they are safe and accessible.

Technological issues

Unlike many other modes of transport, shared mobility is highly dependent upon IT. As transport is increasingly digitised, it will become more and more important to understand its equalities' impacts. The issue came up repeatedly in focus groups – from the loss of phone battery, data coverage, bugs in the app or service, or simply difficulties using the app. The impact of these experiences varied from basic frustration, increased costs, to missing appointments and fearing for one's personal safety.

- "My friend had a problem uploading his details and I've had problems before where I'm trying to end a ride and it's not letting me end and the clock's ticking up, taking money from you and you're trying to end it and it's not letting you." (Focus Group 3, Irregular rider Group, A few times)
- "I'd say, every time I've used one, I've had some kind of issue. Whether it's not got any charge or my one the other day, the indicator wasn't – you couldn't turn it off, so it was just indicating the whole time. And then the most recent one I used ran out of charge very quickly and just stopped. And then I wasn't – then I went on the app and it had just gotten rid of it, but it was still charging me. I really enjoy it and I still use them, but I've always had like some kind of problem." (Focus Group 3, Irregular user Group, A few times)
- "It can take quite a long time [to unlock] and sometimes you can feel a little bit unsafe when it's dark or you're in quite an isolated spot, kind of stood on the roadside, waiting for the scooter to load." (Focus Group 4, Regular user Group, Fairly regularly)

Indeed, mistrust in the technology was mentioned as having a role in shaping the kind of trips that riders opted to use e-scooters for.

- "I do have one friend that used them as a bit of fun on holiday - she said you would never use it if you had to get somewhere on time, or you were in a rush. Only when you have time to mess about and fiddle around in the park that they're quite fun, other than that she wouldn't use them." (Focus Group 1, Non-user Group, Never ridden)

This view perhaps highlights the time pressures on utility travel and how, despite the speed of the e-scooter itself, the perceived unreliability of IT reduces their viability for many trips – particularly for those under time pressure.

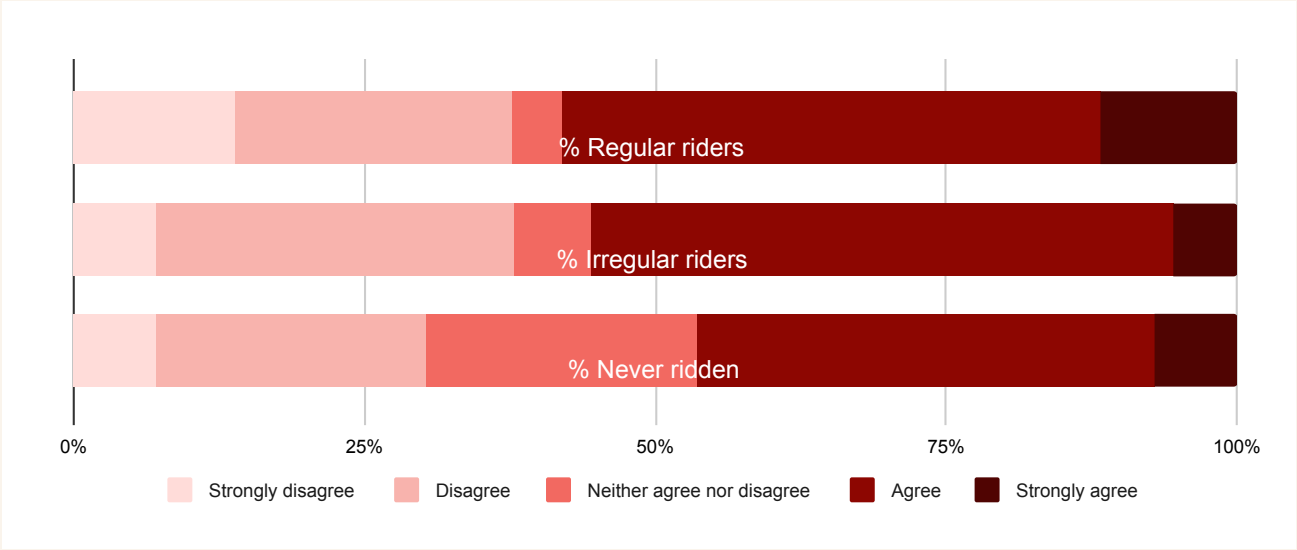
Indeed, the proportion of survey respondents who agreed with the statement 'A barrier is my level of confidence in the reliability of the service (e.g. the app working correctly, finding a working scooter)' was high across all rider groups. Notably over half of irregular and regular riders.

Problematic "safety" features

Some features of e-scooter services, including reduced operating hours, speed or area restrictions that have been designed to improve the safety of riders and the people around them, were considered problematic. In many cases, participants felt they adversely affected women's safety and utility, though often context dependent.

Slow speed ones have been introduced in many areas to address concerns about e-scooter speeds

Figure 5: *"A barrier is my level of confidence in the reliability of the service." (e.g. the app working correctly, finding a working scooter)*



in shared-use environments, such as pedestrianised areas or parks. They are GPS-controlled geofenced areas within which the maximum speed of e-scooters is capped at a lower speed than normal. These zones, however, do not operate without adverse impacts on women. Some focus group participants cited dangers of riding into slow zones with unexpected deceleration. Others discussed how they felt unsafe riding in them at night due to the slow pace, or needing to walk the heavy scooter.

- "You find yourself losing a little bit of balance - most of the time it's like a park, not proper traffic area of the city, but still it's not the safest option. Maybe we should have like a sound coming out from the scooter warning you that you are about to enter a slow speed area." (Focus Group 4, Regular rider Group, Every day)
- "You don't necessarily know when you're going to go into a road that slows it down or that you can't drive on, it's not usually that clear unless you really map your route out. So I did that once – I was on my own on my way home from – it was in the evening, so it was dark, and I ended up on a road where I couldn't be. So then I had to manually walk the scooter to a nearby road, which I felt again quite exposed doing, and I know it was probably my fault that I should have checked them out more carefully before setting off, but there wasn't a warning from the app or anything. All of a sudden I found myself having to walk down quite a dark road with the scooter, which isn't... you don't feel that safe doing. So I think the safety side of things is probably my main concern. (Focus Group 4, Regular rider Group, Fairly regularly)

Some local authorities restrict the operating hours of shared e-scooters, largely in response to concerns about intoxicated riding. However, the blanket restriction on operation, particularly late at night, was described by focus group participants as curtailing their potential for independent travel, when other modes may feel less safe, more expensive, or not available (for example, walking, a taxi or night bus).

- "The other day we tried to use it, with a couple of friends. We went out Saturday night and I don't know why exactly, but it wasn't allowed to be used at certain hours. I think it was 1am." (Focus Group 1, Non-rider Group, Never ridden)
- "I think a big benefit I've found about them as a woman as a safe mode of transport home, so it's a good way of getting home that I can afford as opposed to an Uber or something 'cause at Liverpool at the moment you can't really walk anywhere at night on your own." (Focus Group 3, Irregular rider group, A few times)

4.4.2 E-Scooter design

During focus groups many participants suggested the design of e-scooters excludes the needs of women and

other groups. This included the ability to carry bags and other items, the scooters' weight, and how they handle and manoeuvre, to other disabling features.

- "There needs to be either some solution to physically alter the scooters to make sure you can carry something with you, or to offer women some kind of a solution like a bag you could put over the handlebars that you could put your handbag into as a solution to that." (Focus Group 1, Non-rider Group, Never ridden)
- "They're heavy suckers. I just found him to be kind of a little bit more unwieldy than I would have guessed when I first got on, and I think. I don't speak for all women, but that kickstand you really have to manhandle them." (Focus Group 3, Irregular rider Group, A few times)
- "I just thought that they were really quite heavy and I went to one place where I needed to stop and take it up the curb. I consider myself pretty strong really... and I found it quite heavy and It's got a massive turning circle so it's really hard to turn it, it takes ages. That was a challenge." (Focus Group 4, Regular rider Group, About once a month)
- "If someone is in a wheelchair, they have some sort of leg injury, you know [e-scooters are] something that they wouldn't be able to use because you need that balance. So you are sort of excluding a group there in terms of that, so you know if there is... I don't know, a futuristic version where there's a seat on them?" (Focus Group 5, Mixed rider Group, A few times)
- "My phone doesn't fit in the holder, which is really frustrating because it means I usually have a bag with me or at least a pocket to put it in. But when I then have to stop and I've reached my destination, it's a bit of a pain getting it out and then taking the photo. Also it wasn't the first time I used one once, the phone holder fell off." (Focus Group 4, Regular rider Group, Fairly regularly)

While shared e-scooters cannot provide a solution to every journey need, they were seen as heavy, difficult to manoeuvre, unable to carry accessories and support those with poorer balance. Participants felt this likely to exclude many women, disabled and older people from using them.

4.4.3 Recommendations

5. E-scooter operators should consider an inclusive design approach to e-scooters and shared services that better accommodate different potential riders' needs and use-cases.

The typical e-scooter (service) today could be characterised as designed for a 'default' man – weight, accessibility and features may not suit the variety of people it could cater for.

Features may be added to improve personal safety, such as a location-sharing feature (similar to City Mapper or Uber), or an advance booking system at night-time. Physical improvements may include a tow bar for children's push scooters or bike trailers; or a basket or hook for clothing or small bags. Operators could also ring fence a certain number of 'accessible' scooters in a given area.

These improvements should be led by e-scooter operators, who should strive to ensure their workforce represents the diversity of the places in which they operate, and foster inclusive cultures where the perspectives of women from all backgrounds can be heard. Where design proposals are precluded by existing regulations, national regulators should pay due consideration to women's needs, and other equity seeking groups, when considering revising regulations.

6. Local authorities and e-scooter operators should collaborate to ensure women's transport needs and experiences inform the development of e-scooter regulation and services in specific areas, particularly the location of parking docks and development of infrastructure.

Maximising service benefits for women involves incorporating a broad understanding of how women use transport and what they want or need from it, e.g. women are more likely to trip chain (i.e. multiple stops in a single outing) than do a linear home-work commute. But it should also consider women's experiences of using e-scooter services to ensure specific, unintended exclusionary features are mitigated. One exclusionary feature was reported to be GPS controlled slow zones and limited operating hours, particularly affecting a sense of personal safety during night-time travel. Considerations around women's night-time safety should be considered against general safety considerations that have compelled the introductions of these zones in the first place – for instance through equality impact assessments.

This will require a shift in the procedural elements of service design. Gaps in datasets should be acknowledged, as women's use of transport is already (self-) restricted. Current needs must be designed for, but

other needs not shown by existing data should also be considered. Indeed, public engagement (e.g. the types of focus groups used here while ensuring demographic representation of a specific region) and rider feedback on service specifics (e.g. through in-app feedback) should be used to inform design.

Vienna's Department for Gender Mainstreaming offers a best practice example of how local authorities can work with operators to produce an equitable regulatory environment.[9]

Operators and local authorities must reflect the demography of the regions they are serving in order to design and have decisions informed by both expertise and experiences of the communities they serve. Inclusive working environments are a vital accompaniment.

7. Local authorities and e-scooter operators should collaborate to ensure local environments and cultures support night-time safety for women, for example, ensuring public spaces are sufficiently lit, and providing bystander awareness and education to help prevent violence and harassment of women and girls. These research findings show women's travel is affected by perceptions of safety travelling at night – be that routes, mode choice, or decisions when to travel. Safety improvements to the wider urban environment should be considered by local authorities to complement improvements to service design – for instance, ensuring key routes and locations (including, as above, parking locations) are well lit.

Cost-cutting and net-zero concerns means lighting sometimes suffers. Where these constraints exist, e-scooter operators should share route data (e.g. day vs night routes), and engage people locally, to inform councils of areas to prioritise. These improvements to the urban realm can have knock-on benefits for other modes; indeed, rider data available from shared e-scooter operators can offer insight devoid from on-foot or (privately owned) bicycle journeys, demonstrating mutual benefits of e-scooter operators to local authorities' wider transport schemes.

Wider public education and awareness-raising is also vital, for instance providing bystander training to help prevent violence and harassment of women and girls.

4.5 Perceptions of infrastructure

Infrastructure was cited as a key factor shaping perceptions of e-scooters, informing ridership. There was perceived to be an overall lack of safe spaces to ride – streets and roads were considered dangerous and drivers hostile, while it is anti-social to ride in pedestrian spaces. Indeed, over three-quarters of all survey respondents (79%) felt that not feeling safe due to infrastructure was a barrier to not using shared e-scooters (more).

As with cycling, if shared e-scooters are to achieve their full potential, they will require suitable and dedicated infrastructure – shared with other 'slow' micromobility modes – or sufficiently slow- and low-traffic streets, where e-scooter riders can safely use the carriageway. Restrictions on other parks and open spaces should be reconsidered, particularly the role of slow zones for personal safety at night and for eroding the time-savings (short-cuts) many parks offer micromobility over the car.

4.5.1 Riding spaces

Across all ridership groups, women perceive a lack of appropriate space to ride e-scooters safely and comfortably. The carriageway was generalised as unsafe and drivers seen as unwelcoming, if not hostile, particularly towards women on e-scooters.

- "I've personally found that when there's not a cycle lane, and there's nowhere safe for me to scoot, when I have to scoot in the same lanes as cars that I'm frequently beeped out and shouted at when I know I'm not doing anything wrong." (Focus Group 5, Mixed Group, Very regularly)
- "I'm obviously a girl on the bike, my experience is always that a lot of cars are very aggressive and beep at me a lot when I'm on it. If I hesitate at a light when I'm trying to push it, they're very quick to be quite aggressive, whereas I don't find that when I'm in a car, 'cause maybe they can't see that I'm a woman? I don't know if that's the exact link. Maybe it's more something towards people on scooters, but I feel like I definitely get it more than the guys I see using it." (Focus Group 3, Irregular rider group, A few times)

Indeed, 83% of survey respondents (strongly) agreed the attitudes of drivers and other road users towards e-scooter riders was a barrier to riding shared e-scooters (more). This highlights a widespread perception

[9] *See: Vienna Section for Gender Mainstreaming (2021), Gender Mainstreaming Made Easy*

that e-scooter riders are stigmatised by other road users, resulting in perceived threats to safety. Participants said drivers should be educated on e-scooters, in contributions that again revealed the perceived dual responsibility of government to better communicate with the public:

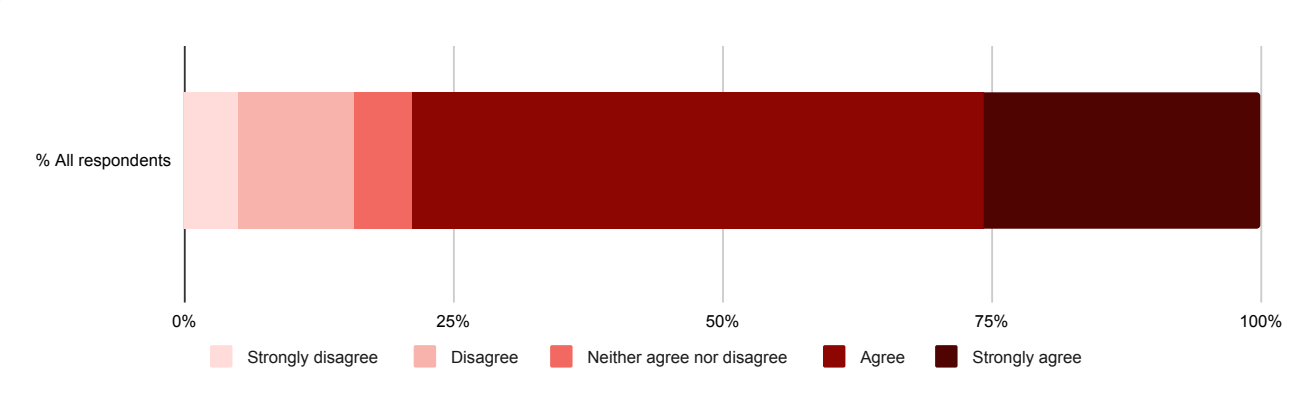
- "I think education for everyone, not just scooter riders, would make a big difference because it's actually quite scary as you know, as quite a small, young person being on a scooter." (Focus Group 5, Mixed Group, Very regularly)
- "I think [education] shouldn't just be the responsibility of e-scooter operators...like this needs to come from government somehow because they are the only people with the sort of moral authority to be making these announcements and putting in public ad campaigns to educate drivers. It definitely is needed." Focus Group 5, Mixed Group, Never ridden)

It may be that drivers' negative attitudes to e-scooter riders is a manifestation of the view that e-scooters are transgressive, a nuisance, or simply not a legitimate mode of transport, as discussed in 4.2 and in relation to cycling by Aldred and Jungnickel.[10]

Nonetheless, some participants perceived existing segregated lanes to be unsuitable in their current form due to being designed primarily for bicycles, rather than for all modes of micromobility.

- "The wheels are quite small and the speeds that they travel at is very concerning from an individual user perspective. Certain surfaces are inappropriate because if you hit something you can fly off." (Focus Group 2, Non-rider Group, Never ridden)
- "For me it's just fear of injury, and probably the fear of where I can use the space without coming into conflict with other vehicles really. Because I won't ride it on the pavement. And probably the quality of the surfaces and the space that I do have - in some places the quality of the road is quite good and smooth, and there's a designated path. But there's also other wheeled users that are using that path. So again, if I'm not very confident or very speedy, not fast enough, I might get clipped by somebody on a bike or another person on a scooter." (Focus Group 2, Non-rider Group, Never ridden)

Figure 6: *"A barrier is that I don't feel safe on the roads with traffic and general lack of infrastructure."*



This further highlights long-standing issues with the quality of some cycling infrastructure, and that, with the arrival of e-scooters, bicycle and street design standards or guidance may need to be further updated to reflect the requirements of e-scooters and e-scooter expertise involved in the design of new or improved infrastructure.

4.5.2 First-time riding

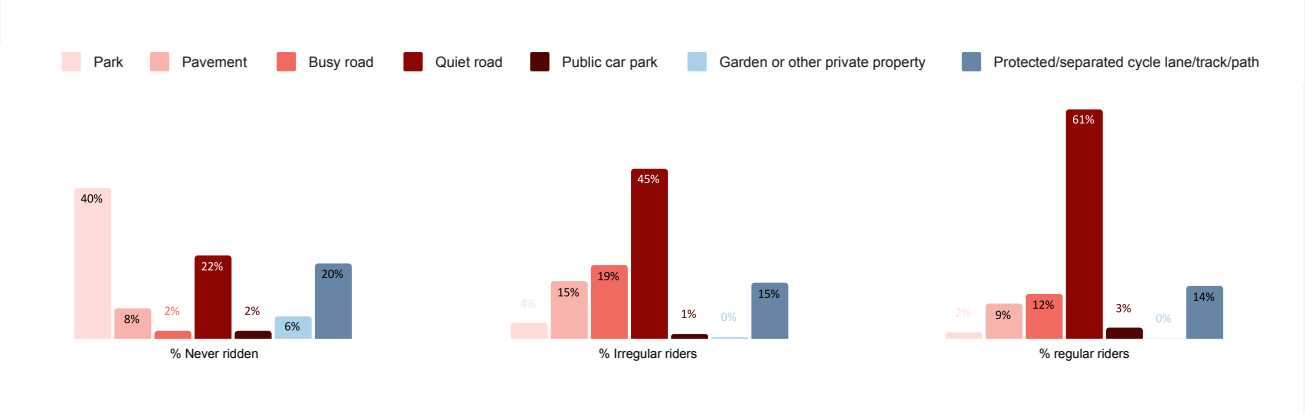
In addition to peer support for first-time riding (see 4.3), having appropriate spaces was also critical to support people to ride e-scooters for the first time and gain confidence. Even beyond a first ride, some regular riders said they exclusively, or at least initially, rode them on familiar routes, and/or when they knew the roads would be quiet – sharing road spaces not giving them confidence to try new routes. For example:

[10] *Aldred, R, Jungnickel, K, (2012) Constructing Mobile Places between 'Leisure' and 'Transport': A Case Study of Two Group Cycle Rides. Sociology. 46(3):523-539*

> "If it hadn't been for [my partner] being really keen to try them, I probably never would have tried them. So one day we did go quietly around some quieter streets to practise...now I think if I know the route I'm going, I feel pretty confident. I know that I won't go to the train station 'cause there's a really big junction." (Focus Group 5, Mixed rider Group, Fairly regularly)

Survey participants were asked about the first time they rode, or the first time they would ride, a shared e-scooter. Breaking down by rider group, there are evident disparities between the type of environment perceived to be ideal by non-riders, versus the environments that riders opted for the first time they rode. In particular, non-riders mostly saw parks as ideal locations for first-time riding – but due to discussed service design limitations (e.g. geo-fenced no-ride zones, docking locations) this was evidently not often a viable option for riders, with negligible numbers first riding in a park.

Figure 7: *Type of location for first ride (or expected first ride) by rider group*



4.5.3 Recommendations

8. Local and national governments should place the development of infrastructure and reallocation of road-space in our cities at the heart of their mobility frameworks, and at the top of their wider transport, environmental and public health agendas.

This means national governments need to provide sufficient funding, guidance and regulatory support, and local government rebalancing street space in consultation and engagement with local communities. Copenhagen and Amsterdam are classic examples of good practice in the reallocation of space, shifting away from car-use and creating better options for walking and micromobility, while the example of Berlin since the onset of the pandemic, demonstrates how space can be reallocated rapidly.

Infrastructure development should be accompanied by ongoing analysis of how e-scooters interact with other street space users, including bicycles and pedestrians. National and local authorities should consider whether design, signing guidance and traffic regulations need to be amended to cater for different forms of micromobility.

Government, transport authorities and operators need to be brought together to integrate different modes of travel to better support car-lite and car-free lifestyles, for example, providing quick interchange between modes at stations and considering the 'mobility hub' model.

Until the transport sector fully represents the communities it serves, the development of infrastructure at all levels of technical work and decision-making, must be underpinned by a procedural involvement of women, and other underrepresented groups and protected characteristics.


Parking photo
Make sure the entire vehicle is inside the square before you snap.

5. Limitations and future directions

THE FOLLOWING ARE limitations of the methodology that should be considered in relation to the findings of this report, and guide future research in the field.

- **Recruitment channels:** Focus group and survey recruitment took place primarily through two channels, Voi and Women in Transport mailing lists. The high engagement levels of these mailing lists mean we attracted many interested respondents. However, this meant participation was mostly limited to people on those lists, and anyone they opted to share the registration link with. Demographic information collected for the survey revealed the sample was not representative of the general population in terms of previous e-scooter ridership, with only around 10% of our sample having never ridden e-scooters. The geographic spread is also unevenly spread across the UK, and with a higher educational level than the national average. This means the findings should be considered as indicative.

- **Demographic unknowns:** Certain demographic data was not collected from focus group participants and survey participants. This should be considered when comparing the findings of this study to other research reports. As per the following recommendations, there is room for the industry to set a gold standard in demographic data collection to ensure findings can be readily compared.

- **Virtual data collection:** Focus groups were held online and the survey could only be completed online. While collecting data online has clear accessibility benefits, including having people from multiple locations in a single focus group, gathering more responses quickly, and enabling participation from those with limited time, the virtual format also has drawbacks. For instance, focus group participants may have been less able to build a connection and rapport with other participants, and the sessions and survey were inaccessible to those without online access or with low digital literacy. Alternative qualitative data collection environments could be considered in the future, for instance 'ride-alongs', where participants' reflections are prompted by immediate experience rather than questioning.

- **Men's views:** The focus of this research was to better understand women's experiences and perspectives around e-scooters, so men's views were not considered. There is opportunity for further research exploring similar themes but focusing on the perceptions and experiences of men.

5.1 Recommendations

As a result of this project we have identified issues with publicly available information on shared e-scooter ridership on a local, national or operator level. We have also identified that no guidance or standard practice exists around independent e-scooter research and data collection to ensure a comparable body of research develops.

9. A 'gold standard' for ridership monitoring should be established, and adhered to by local government, national government and e-scooter operators.
This standard should define a consistent approach to the collection of demographic data to enable disaggregation and comparison across and between different groups, informed by the UK list of 'protected characteristics'. This will ensure that data collected on e-scooter ridership is comparable, and any diverging or intersecting trends across the different groups and characteristics is brought to light to enable action. This will also set standard parameters for researchers to follow when collecting data for additional research projects.

10. E-scooter operators should report gender disaggregated annual ridership figures, including the gender gap.

Publication of such ridership data will ensure there is transparency across the industry and among operators. This will create a consistent picture of cross-industry progress and motivate corrective measures by individual operators, echoing steps that have been made as a result of gender pay gap reporting in recent years.

Where differences between operator and/or region transpire, this can create opportunities for best practice sharing.

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For more information related to the research please get in touch with JFG Communications via the following email address: **joe@jfgcomms.co.uk**