University of
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MANCHESTER

Healthy
Active
Cities

E-Scooters in Salford

Interim Report, May 2021

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Transport for
Greater Manchester

lime

Healthy Active Cities is a research group at the University of Salford that was formed in 2018 to bring together researchers and stakeholders to develop research on transport in Greater Manchester and beyond. The group has a particular interest in sustainable and active travel technologies and practices. It is based across the School of Health and Society and the School of Science, Engineering and the Environment.

The **Sustainable Housing & Urban Studies Unit (SHUSU)** is a dedicated multi-disciplinary research and consultancy unit providing a range of services relating to housing and urban management to public and private sector clients. The Unit brings together researchers drawn from a range of disciplines including social policy, housing management, urban geography, environmental management, psychology, social care, and social work.

Lime's mission is for a future of transport that is shared, electric and zero-emission. As the world's leading provider of shared electric vehicles, Lime partners with cities to deploy electric bikes, e-scooters and e-mopeds to serve any trip under five miles. One of Time Magazine's 100 Most Influential Companies in 2021, Lime has powered more than 200 million rides in more than 150 cities across five continents, spurring a new generation of clean alternatives to car ownership. Lime is the largest micromobility operator in the UK with over 3 million rides delivered across its London e-bike and Greater Manchester and Milton Keynes e-scooter services to date. Lime was also recently selected to deliver the UK's largest e-scooter trial in London.

Transport for Greater Manchester (TfGM) is the local body responsible for delivering Greater Manchester's transport strategy and commitments. It's our job to do everything we can to keep the city region moving and growing, putting the customer first in everything we do to help make travel as safe and simple as possible. We are directly accountable to the Greater Manchester Combined Authority, led by the Greater Manchester Mayor, and the Greater Manchester Transport Committee, made up of elected Members from all ten Greater Manchester Councils. TfGM's Innovation team is responsible for researching and trialling new mobility technologies and systems including mobility-as-a-service, connected and autonomous vehicles, and smart city technology. As part of our Innovation programme, we have supported Salford City Council and Rochdale Borough Council in delivering the first e-scooter trials in the region.
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Foreword

Transport for Greater Manchester is proud to support this important research by the University of Salford to investigate the impacts of e-scooter rental schemes in Greater Manchester. Salford is home to one of the UK's first e-scooter rental trials, and we will continue to work with the University to collect evidence and generate insights, aiding our understanding of the potential impacts of micromobility on our transport network. This will support our efforts to reduce congestion, make our air cleaner, and improve connectivity to public transport hubs.

As described in the Greater Manchester Transport Strategy 2040 – our long-term plan to create a city-region where people have a better quality of life with improved health, a greener environment, and a stronger economy – we want 50% of journeys to be made by walking, cycling or public transport by 2040. That's a million more sustainable journeys per day. Key to achieving this is providing people with a range of flexible and sustainable travel options, such as e-scooters. We're also planning for a more sustainable future. Through the Five-Year Environment Plan for Greater Manchester and the Greater Manchester Clean Air Plan, we aim to make our city-region a cleaner, greener and healthier place to live, work and play in.

As part of our Innovation programme, we have supported Salford City Council and Rochdale Borough Council in setting up e-scooter rental schemes as part of a Department for Transport programme of trials. The trials, and supporting research by the University of Salford, will help us to better understand the impact of e-scooters on travel in the region and how they could be used in the future to support our sustainable transport goals.

E-scooters have proven to be hugely successful in many other countries around the world and we are already starting to realise the benefits they offer to Greater Manchester. This independent research by the University of Salford greatly enhances our understanding of the challenges and opportunities for this new mode of travel and will help us shape future policy in this area to encourage more sustainable ways of traveling.

Nicola Kane
Head of Strategic Planning, Insight and Innovation
Transport for Greater Manchester

Executive Summary

As part of national trials in the UK, an e-scooter share scheme is being operated by Lime in parts of Salford. Launched in October 2020, it is expected to run for an initial period of twelve months and will contribute towards an evidence base on the potential role of these new vehicles within the transport systems of towns and cities. The trials reflect policy goals at the Greater Manchester level to address congestion and air quality and, in the current context of Covid-19, to provide forms of transport that enable travel while social distancing.

E-scooters can be understood as part of the micromobility sector and this study contributes to a rapidly developing field of research on these new forms of mobility. Whilst e-scooters are arguably less active than modes of active travel as they are conventionally understood - i.e. walking and cycling - they interface with this area of research in that they can complement and be combined with journeys by foot and cycle and will often share spaces with them. Commentators have highlighted the importance of understanding the ways in which e-scooters and their riders interact with other road and pavement users and, in particular, how people who are vulnerable due to sight, hearing, and mobility impairments might be affected. Potential social inclusion in the user base is also of interest, and some early investigation has sought to understand trends across gender. Researchers have also begun to investigate the environmental impact of the vehicles and place them within the context of a shift towards electric mobility.

This study is mixed methods social research, comprising reference groups, interviews and an online survey and taking place over 2021. This report presents findings from the first stage of data collection comprising six reference groups, 11 interviews and an online survey with 739 responses. In interpreting the findings, we note:

- It is important to recognise the implications of the Covid-19 context. This first stage took place at a time when people were asked to stay at home, many people were working from home, and most shops, hospitality, sport and entertainment facilities were closed. Participants were therefore asked about how they envision themselves using the e-scooter share scheme.

- It should also be borne in mind that the e-scooter hire scheme was at that stage operating across a relatively compact area, limited to the University of Salford's Peel Park campus and MediaCityUK and a defined route between the two. Stage 3, in which the scheme was expanded, did not commence until after the data collection for this report.

- Alongside the official share scheme run by Lime, the illegal use of privately owned e-scooters (and in some cases, illegal share schemes) can be observed across Greater Manchester. In the experiences and perceptions of our research participants, we note that these different forms of e-scooter use are not necessarily differentiated.

- In 2018, Greater Manchester had a public bike share scheme that was run by Mobike. This received some high-profile media attention, with reports focusing on theft, vandalism and cluttering of public spaces. Many of our participants associated this new e-scooter trial with the legacy of this short-lived bike share scheme.

Our research indicates that:

- People have begun to use the e-scooters and the majority of use so far has been for fun or out of curiosity. When asked to think about potential use, respondents evidence ways in which e-scooters could fit into their mobility patterns, including in some cases using them in place of other modes or in combination with them.

- The small operational area of the trial meant that the extent of possible journeys at the time of the study was very limited.

- The small operational area also had an impact on user experience, as users often had to use their smart phone to navigate during their journeys to ensure they stayed within the geofence.

- There is some indication that current and potential use differs by age group, with young people being more likely to see themselves using them.

- Some participants noted it was important for cost to be competitive with other modes of public transport for them to consider using the scooters.

- Concerns about road safety and, to a lesser extent, personal safety while riding were the most frequently given answers to questions around barriers to use. Those who had not yet used an e-scooter were much more likely to express this concern, as were female respondents.

- There appears to be differences across gender in relation to how respondents see themselves using e-scooters. Male respondents indicate that they are more likely to use e-scooters for trips with a purpose beyond recreation or curiosity, i.e. to build e-scooter use into their travel patterns.

- In our discussions, respondents, and women in particular, alluded to the potential for e-scooters to enable them to avoid situations in which they might feel unsafe, such as waiting for public transport. They also, however, saw a potential risk of attracting unwanted attention when using the vehicles.

- In relation to the Covid-19 context, respondents saw a role for e-scooters in enabling social distancing. One commented however that this may be difficult in potentially crowded shared space.

- Our discussions with vulnerable road and pavement users highlighted the need to carefully consider the implications of these new vehicles, particularly where they are used in spaces that are shared with pedestrians.

Lime e-scooters at the autumn 2020 launch at University of Salford

1. Introduction

The Healthy Active Cities team at the University of Salford is conducting a study alongside the Department for Transport's e-scooter share scheme trial taking place in towns and cities around the UK.

1.1 Overview

The focus of this study is the trial taking place in Salford, which is running for one year from Autumn 2020. The trial involves the provision of Lime e-scooters for hire, starting with a spatial focus on the University campus and MediaCityUK, and subsequently expanding to cover a larger area of Salford. The research is funded by Transport for Greater Manchester and Lime.

The study comprises a combination of qualitative and quantitative social research methods across online surveys, reference groups and in-depth interviews. It seeks to understand experiences and perceptions in relation to the scooters, to identify who is using and might use the scooters, why (and why not), how, and for what purpose, and to place the scooters within a broader context that takes account of other road users, the wider community, and vulnerable people in paticular. Due to the scheme being in its early stages and operating in a limited area, the researchers were keen to understand how people could see themselves using e-scooters, if they had not yet tried them.

The work builds upon the teams' previous research on e-scooters, bike share and e-cargo bikes and contributes to the rapidly developing field of micromobility research.

1.2 Aims

In particular, the research will investigate and create an evidence base on:

- who is using, or considering using, e-scooters and how these groups could be categorised;
- reasons for using e-scooters and potential barriers to (further or more extensive) use;
- journey purposes and other factors motivating use of e-scooters;

- the relationship of e-scooting with other modes of transport and how this may encourage inter-modal travel and drive patronage to more sustainable modes;
- the nature of the e-scooting experience and its relationship with the urban context, including physical infrastructure, traffic and interactions with other road users, pedestrians and cyclists;
- perceptions of e-scooters by users and non-users in relation to convenience, impact, safety, the public realm and interactions with others;
- the distribution of the above factors across demographic groups including gender, ethnicity, socio-economic status and levels of vulnerability and the implications of this for uptake and social inclusion.
- the influence of the Covid-19 pandemic and associated policy responses over use of, and perceptions relating to, e-scooters.

The researchers will be collecting data throughout 2021 to capture a broad range of responses as the share scheme is expanded across Salford, including an ongoing set of reference groups, interviews with e-scooter users and others, and further online engagement.

The final project report will provide detailed findings and insights into the implications of the trial for UK policy and the development of micromobility in Greater Manchester and the UK.

1.3 This report

In **Chapter Two** of this interim report, we provide additional context around e-scooters and the Department for Transport trial taking place in Salford, as well as positioning the emerging technology of e-scooters, and this study, within current academic research. In **Chapter Three** we provide an interim analysis of the findings to date, drawing on the online survey, interviews and reference groups. We close, in **Chapter Four**, with a summary that looks ahead to the future of the Salford trial in particular and identifies priorities for this programme of research. We provide detailed appendices that include our methodology, online survey and breakdown of survey results, as well as detailed summaries of the six reference groups and 11 interviews.
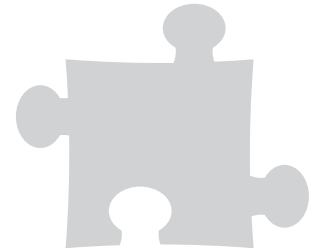
2. Context

The e-scooter hire scheme in Salford is part of a national trial that will provide an evidence base on the potential role of these new vehicles in future transport systems. E-scooters can be placed within a broader spectrum of micromobility and technology-based sharing.

2.1 E-scooters

An electric scooter, or e-scooter, is similar in appearance to a manual push scooter, except it has the addition of an electric motor. This means rather than using their body to move the vehicle, the rider moves the scooter by controlling the motor.

This technology positions the scooters as part of the electrification of transport and within the growing micromobility sector. Micromobility aims to provide short-distance, environmentally friendly transport options, primarily in urban areas (House of Commons Select Committee, 2020; Sherriff et al., 2020). The term describes technology-enabled, shared transport provision, such as bike and e-scooter share schemes. Such schemes generally require the user to access

the service using a smartphone App that manages payment, unlocks the vehicle, and can provide GPS navigation in order to limit use to the area within a geofence (the operational area within which the user can ride and park the vehicles).

Motorised scooters have a long history, dating as far back as 1915 with the development of the Autoped - the world's first motorised scooter (Mansky, 2019). It is relatively recently, however, that e-scooters have become one of the fastest growing consumer-led phenomena in the world (Rose et al., 2020), providing access to a new form of transport in towns and cities that has caught the attention of transport planners and the general public.

Lime e-scooters at the autumn 2020 launch at University of Salford

Closure of Deansgate, Manchester to general traffic in 2020 as part of social distancing measures

2.2 UK National Trial

The Salford e-scooter share scheme is part of a national trial intended to provide an evidence base on the potential for e-scooters to play a role in the ways people get around and on how they will interact with other road and pavement users. The findings will be used to guide future policy decisions around whether, and to what extent, to fully legalise e-scooters in the UK.

Such trials are currently taking place in 55 locations and in June parts of London will join the list of locations[1] and bring the number of operators involved to 12: Beryl, Bird, Dott, Ginger, Lime, Neuron, Spin, Tier, Voi, Wind, Zipp, and Zwings. In addition to the schemes that run on a per journey ('hop on hop off') basis there are a small number of trials of longer term leasing such as one being led by the West of England Combined Authority[2].

Outside of the trial areas, use of privately owned e-scooters in public spaces - including roads, pavements and parks - remains illegal, as do any hire schemes that operate independently of the national trials. In all the trial areas, e-scooter use is permitted only on roads and cycle lanes (including officially shared infrastructure) and users must be at least 18 years of age and hold a valid UK full or provisional driving licence. The scooters are legally limited to 15.5mph, although areas can implement their own speed restrictions.

In Spring 2020, there was a call for evidence around micromobility vehicles, flexible bus services and Mobility-as-a-Service as a response to the Covid-19 pandemic[3]. Trials of e-scooters were planned to take place in four Future Transport Zones[4]. These trials aimed to build an evidence base to inform future policy decisions on e-scooter use. During the Covid-19 pandemic, in May 2020, the UK Government announced a package of £2 billion to support the development and installation of new cycling and walking infrastructure[5], as part of the Government's efforts to improve green transport in an unprecedented era of social distancing. As the Covid-19 crisis continued to deepen and the potential for e-scooters as a potentially Covid-safe form of transport became recognised, the Department for Transport (DfT)

1 https://tfl.gov.uk/info-for/media/press-releases/2021/may/tfl-and-london-councils-announce-london-s-e-scooter-trial-will-begin-in-june

2 https://travelwest.info/projects/e-scooter-trial

3 https://www.gov.uk/government/consultations/future-of-transport-regulatory-review-call-for-evidence-on-micromobility-vehicles-flexible-bus-services-and-mobility-as-a-service

4 https://www.gov.uk/government/consultations/legalising-rental-e-scooter-trials-defining-e-scooters-and-rules-for-their-use/legalising-rental-e-scooter-trials

5 https://www.gov.uk/government/news/2-billion-package-to-create-new-era-for-cycling-and-walking

announced they were bringing forward the e-scooter trials and opening them up to any local area around the UK with an interest in operating a trial.

2.3 The Salford Scheme

Salford is one of the cities identified to host an e-scooter trial scheme. **Phase 1** of the trial launched on 26th October 2020 and could be accessed on the University of Salford's Peel Park campus only. In February 2021, **Phase 2** expanded the trial to MediaCityUK with a link route connecting MediaCityUK with the University of Salford. The route between Peel Park and MediaCityUK is a combination of shared pavements, segregated cycling infrastructure and service roads. **Phase 3** was launched in Spring 2021 and saw the scheme expand to include the majority of the Salford city zone bordering Manchester, Ordsall and Salford Quays (Figure 1). According to Lime's data, as of the end of March 2021, at the time of the data collection for this interim report and with Phase 1 and 2 active, approximately 27,000 trips had been made. In May, at the time of publication approximately 54,000 trips had been made by 21,000 uniqiue users, covering a total distance of 105,000 kilometers[6].

In a Greater Manchester context, the trials, which are taking place in both Salford and Rochdale, build upon policy recognition of the potential value of micromobility in addressing congestion and air quality challenges (TfGM, 2040). The Greater Manchester Transport Strategy 2040 also mentions the potential for e-scooters to provide a flexible means of travel while maintaining social distancing in the context of Covid-19, improve first and last mile intermodal connectivity, and act as a catalyst for active travel.

■ Phases 1&2   ■ Phase 3   ■ Salford
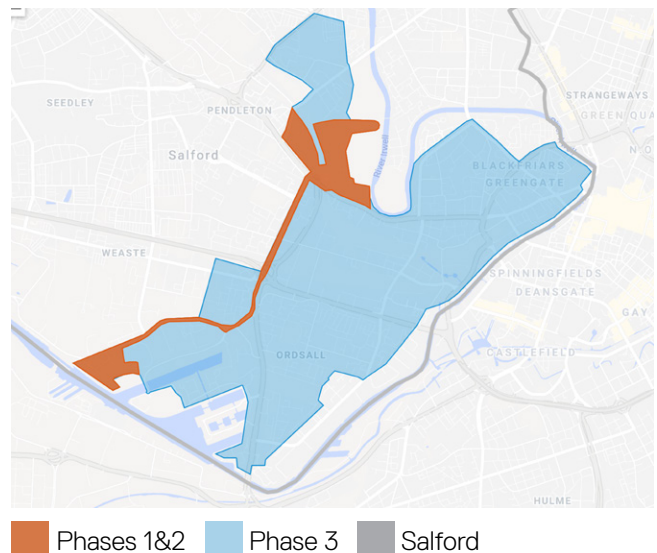
Figure 1 **Phases 1, 2 and 3 of the trial, seen against the administrative boundary between Manchester and Salford.**
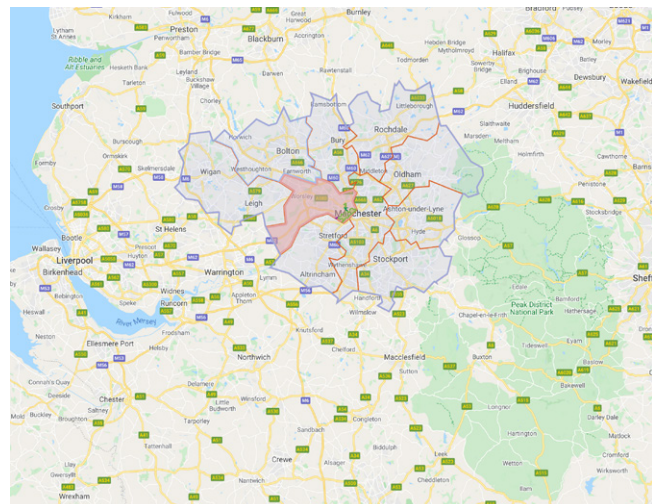

Figure 2 **Salford within Greater Manchester and within the United Kingdom.**

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[6] As of 24th May 2021, 53,587 trips had been made by 21,147 unique users, covering a distance of 105,631 km.

2.4 E-scooters in Research

Research into e-scooters has developed alongside the growing public interest in their introduction as an emerging mobility option in towns and cities around the world (de Bortoli and Christoforou, 2020; Laa and Leth, 2020; Štraub and Gajda, 2020). One of the key criteria for transport planners and researchers to understand is where and how e-scooters can fit into existing transport networks, and how their potential to encourage modal shift away from personal car journeys can be maximised (Sherriff et al., 2020). In order to understand the challenges and opportunities for e-scooters, there are multiple interconnected themes that need to be better understood in the context of the UK's transport system.

Infrastructure is important when understanding where e-scooters can be used in a city (Yang et al., 2020), as well as where they can be expected to be seen. This level of visibility will inform the future relationship between riders and other mode users when it comes to shared spaces, cycle lanes, or pavements, and mitigate the potential conflicts that may unfold as a result (James et al., 2019; Sikka et al., 2019). Safety is a priority for everyone, and reports of e-scooter collisions have been evident in the media (Yang et al., 2020) and operators have been under scrutiny to reassure people that their service is safe (Allem and Majmundar, 2019). Other concerns include the impact of e-scooters on vulnerable road users, who might be put at risk due to the scooter's quiet motor and fast acceleration (Arminas, 2020).

Some e-scooter operators publicly market their services as a sustainable and low-carbon mode of transport [7,8,9], but, as the manufacturing process of the vehicles and the batteries are becoming better understood, some research has questioned these claims (Nocerino et al., 2016; Ho, 2019; Hollingsworth et al., 2019).

Concerns have been expressed about the impact of e-scooters on public health in relation to modal share from private car use towards walking and cycling[10]. Transport planners are seeking to use e-scooters to encourage people to move away from private car use, therefore contributing to fewer CO_2 emissions and cleaner air. Conversely, there is also a concern that the scooters could be used for journeys that would otherwise be walked or cycled, leading to a detrimental effect on public health due to lower physical activity (Glenn et al., 2020; Sanders et al., 2020).

The gender gap is a longstanding area of transport research when looking at cycling and other forms of active mobility (Heesch et al., 2012; Shaw et al., 2020; Grudgings et al., 2021), but when it comes to e-scooters, they might be bucking the trend. Some early research indicates that there is a slight weighting toward male use (Nikiforiadis et al., 2021) but, when compared with cycling, one that is much less pronounced, while others claim that usership leans toward a female majority (Lee et al., 2021). If this is the case – and it is likely to depend greatly on context - it could have far reaching consequences for social inclusion.

This short exploration of a rapidly developing area of research underlines the importance of more targeted research into e-scooter use; better understanding how the scooters fit into people's transport practices, as well as how they fit into the wider transport network. This is the focus of this study.

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7   https://ridegreen.li.me/
8   https://www.bird.co/#bird-air
9   https://ridedott.com/the-dott-way/france
10 https://www.sustrans.org.uk/our-blog/policy-positions/all/all/our-position-on-e-scooters/

3. Interim Findings

In this chapter we present an interim analysis of the first stage of our research and one that provides a baseline and foundation for subsequent stages of the study.

3.1 Introduction

We identify key themes from the study and relate these to our research questions. The analysis is informed by the 741 responses to our online survey, 11 semi-structured qualitative interviews, and six reference groups. Data collection took place over March 2021. Further detail on these data sources are provided in the Appendices.

Covid-19

The Covid-19 lock down and movement restrictions provide an important context and one that should be borne in mind whilst reading this chapter. The restrictions mean that there have been fewer reasons to travel and use transport. With many people working from home and shops, hospitality and sport and entertainment facilities closed, there was less use of transport in general, with the possible exception of increases in walking and cycling for recreation. When people were outside and moving around it was often for exercise and recreation. This means that people were not only less likely to have a need to use e-scooters, they were also less likely to be in the public realm and to see and interact with the scooters. For this reason, we designed the study to look at potential use alongside actual use.

Other e-scooters

As described in Chapter 2, the UK e-scooter trials focus on sharing schemes in specific cities and areas. The use of privately owned e-scooters on roads and in public spaces remains illegal. Despite these restrictions, the use of privately-owned e-scooters can be observed in the trial area. The research team have also observed other

e-scooters being made available for short periods through a separate illegal rental scheme that has no connection with the official national trials. When discussing and answering questions on e-scooters, then, people are not necessarily able to differentiate between rental and privately owned vehicles. People will likely know what type of e-scooter they themselves have used, but their perceptions of other people using e-scooters near them on roads and pavements is likely to reflect the behaviour of both private users and customers of the official Lime share scheme.

Presenting our findings

In order to give an overview of the findings so far, we present the quantitative findings in the form of observations of trends in the data. We combine these with observations and quotations from our interviews, reference groups and the optional written responses provided in the survey. This mixed methods approach allows for the identification of broad trends and an exploration of the factors likely to be shaping these. In exploring these trends, we pay particular attention to the relationship between Users, Deciders and Avoiders, which we describe in the next section, and to differences in practice and perception across difference socio-economic groups.

As this is an interim report, this can be considered an initial analysis on which we will build in more depth in future work. A full account of our qualitative data is provided in Appendices D and E.

In recounting the views of our **interviewees**, **reference group participants** and **survey respondents**, we use the **I**, **RG** and **SC** descriptors respectively.

Data Collection

Interviews **I**

Survey responses **SC**

Reference Groups **RG**
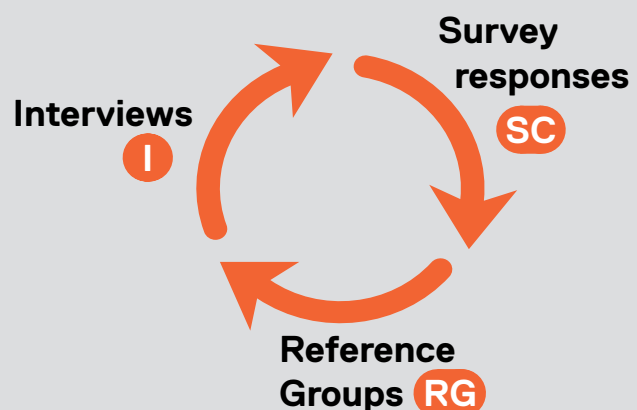
Reference groups

1. Mobility Researchers

2. Transport Planners

3. Community Organisations

4. Road Users

5. Women

6. Disabled People and Vulnerable Users

Interviewees

1. Jessica

Jessica mainly walks, uses a push scooter or takes the bus. She thinks e-scooters could help with public transport capacity issues and social distancing during Covid-19. She has not used an e-scooter in the trial because it does not cover her area and she does not have a provisional driving licence.

2. Sophie

Sophie mainly used public transport and would like to use her bike more. She has used the e-scooters between Peel Park Campus and MediaCityUK and had a few technical difficulties along the way but found the route acceptable. In the future, she's more focused on using her bike more than e-scooters.

3. Alexander

Alexander mainly drives a car and does not use public transport. He has used an e-scooter and thinks they could be useful for traveling around the city for work meetings. He would like to see the scheme expanded and remain dockless.

4. James

James mostly uses a car to commute, although Covid-19 has changed that, and he is thinking about public transport for the future. He has not used an e-scooter but has seen them about. He would consider using one in the future if the scheme expanded.

5. Zara

Zara owns a car but has paused buying a new car because of changed mobility due to Covid-19. She sometimes cycles to work but has experienced harassment on her journey by men and this shapes her consideration of active mobility. She can imagine using an e-scooter to get around during the workday. She worries about accountability or regulation of e-scooters.

6. Louise

Louise is primarily a pedestrian. She has not used an e-scooter and does not own a car. Her main concerns relate to pedestrian safety and she feels pedestrian voices are not always heard in the debate around e-scooter use.

7. Chris

Chris is a regular user of e-scooters in the trial area. He is a regular commuter cyclist and also used to take public transport once a week for his commute. He is positive about e-scooters but has identified a number of issues that need considering. He thinks the geofenced area should be expanded, but cautiously, in order to learn from the mistakes of Mobike.

8. Tanya

Tanya cycles with her family, commutes to work by car, finds public transport inconvenient or insufficient and would like to buy an e-bike. She has never used an e-scooter. She thinks that safety is important and sees issues with both using e-scooters on the road (road safety) and on the pavement (pedestrian safety). She thinks that e-scooters could help us to change our transport habits.

9. Phil

Phil lives in the city centre and walks mostly, occasionally taking public transport. He's used an e-scooter in the trial area for fun and out of curiosity. He thinks they could replace shorter journeys previously made by bus or walking. He thinks safety and cost could be barriers.

10. Sue

Sue lives on the border of Manchester and Salford and walks and catches the bus for transport. She has used an e-scooter in Salford and found it enjoyable. She thinks an e-scooter could really work for her commute but has concerns about using an e-scooter on the road and in cycle lanes.

11. Tom

Tom has never used e-scooters but has a strong interest in them. Cycling is his main mode of transport; he's really into cycling and is also involved with the Manchester cycling community.

3.2 Who is using e-scooters?

Just under a quarter of our sample had used an e-scooter as part of the Salford share scheme run by Lime (Figure 3). A small number had experience of e-scooters that they privately owned, or hired elsewhere in the UK or overseas (Figure 4). Most respondents had used the scooters infrequently (Figure 5), whilst a minority report a degree of regularity in their use. For the purpose of further exploration, our sample can be divided into three groups (Figure 6).

- **Users** have used an e-scooter as part of the Salford trial.

- **Deciders** have not used an e-scooter as part of the Salford trial but state that it is likely (somewhat likely or very likely) that they would.

- **Avoiders** have not used an e-scooter and state that is unlikely (somewhat unlikely or very unlikely) that they would.

The group 'Users' could be further subdivided into those that would or would not use an e-scooter again, the latter group is small and it was decided that, at this stage, there is little statistical value in making this distinction.

Yes	23%
No	77%
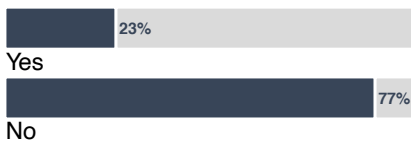
Figure 3 **'Have you used an e-scooter as part of the Lime share scheme in Salford?' (Q3, whole sample)**

No	79%
Yes, privately owned	6%
Yes, another hire scheme in UK	2%
Yes, a hire scheme outside UK	12%
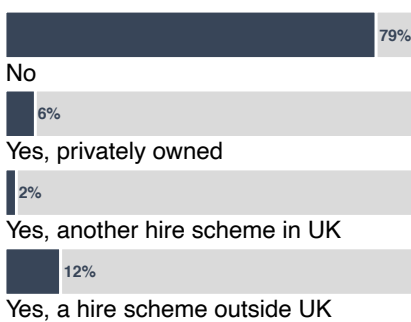
Figure 4 **'Have you used an e-scooter that was not part of the Lime hire scheme in Salford?' (Q4, whole sample)**

Less than once a month	51%
Once a month	15%
Once a fortnight	15%
Once a week	11%
More than once a week	3%
Daily	1%
Don't know	4%

Figure 5 **'Approximately how often have you used an e-scooter as part of the hire scheme in Salford? Select the option that best describes your use.' (Q7, Users)**

Users	23%
Deciders	44%
Avoiders	33%
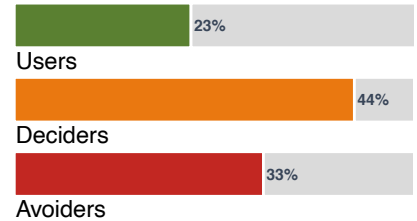
Figure 6 **Descriptors representing actual and likely use (Q1, Q17, Q18, whole sample)**

This categorisation enables comparison across demographic groups. Figure 7a, for example, shows that 49% of male respondents were Deciders: they had not used an e-scooter but would be likely to use one. The figure suggests a modest relationship with gender, with women being slightly more likely to have used an e-scooter in the Salford scheme but also slightly more likely to say they would not use one.

A clearer relationship with age is suggested in Figure 7b, with younger groups being more likely to have used an e-scooter and also more likely to say they would use one[11]. Figure 7c compares those respondents who cycle, drive, cycle and drive, or do neither. It shows that respondents who neither cycle nor drive as part of their regular journeys were more likely to have used an e-scooter. This is encouraging for inclusivity, i.e., providing transport for those who do not have access to a car, but less encouraging for modal shift, i.e. encouraging people to use an e-scooter *instead* of their car.
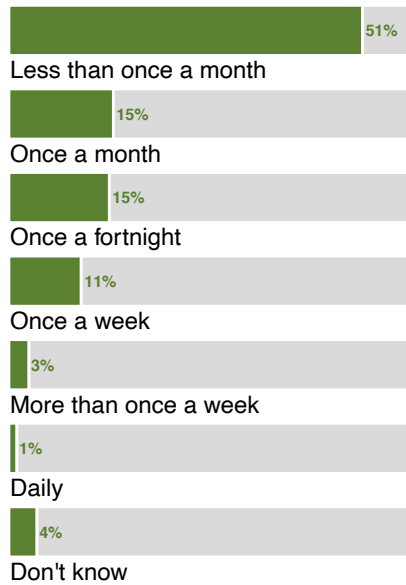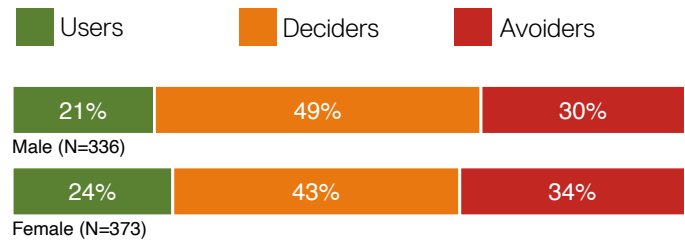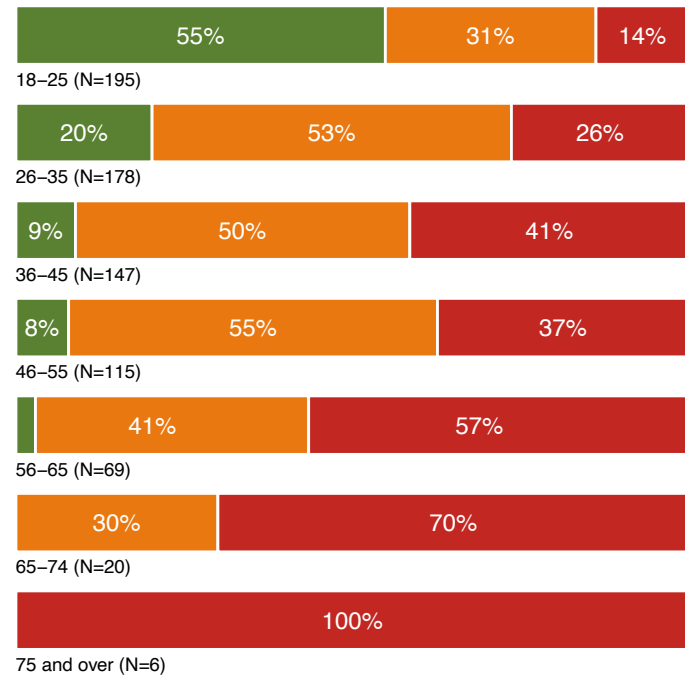
Legend: Users | Deciders | Avoiders

	Users	Deciders	Avoiders
Male (N=336)	21%	49%	30%
Female (N=373)	24%	43%	34%

(a) gender

	Users	Deciders	Avoiders
18–25 (N=195)	55%	31%	14%
26–35 (N=178)	20%	53%	26%
36–45 (N=147)	9%	50%	41%
46–55 (N=115)	8%	55%	37%
56–65 (N=69)		41%	57%
65–74 (N=20)		30%	70%
75 and over (N=6)			100%

(b) age group

	Users	Deciders	Avoiders
Cycle (N=151)	19%	46%	34%
Drive (N=203)	21%	40%	39%
Both (N=149)	11%	59%	30%
Neither (N=238)	35%	38%	27%
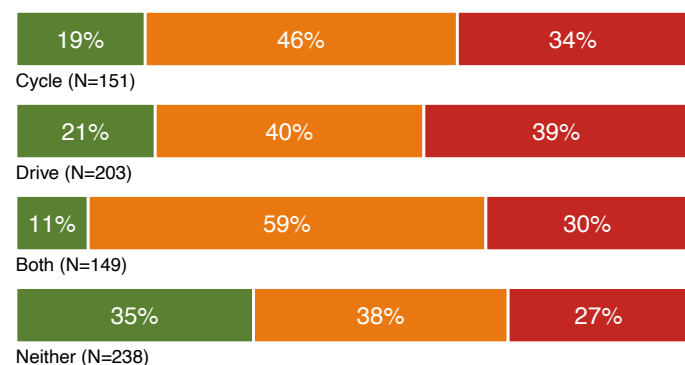
(c) transport practices

Figure 7 **Distribution of Users, Deciders and Avoiders across (a) gender (b) age groups and (c) transport practice. (Q31, Q32, Q38, whole sample)**

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11 Note that cohort sizes become quite small after Age 55.

3.3 Why and for what purpose?

In this and the following sections we draw on data from the survey alongside the accounts of our reference groups (Appendix D) and interviews (Appendix E).

Survey respondents were asked to consider the purposes for which they would use an e-scooter (Figure 8a) and Users were asked to specify the purposes of those journeys *already* made (Figure 8b). Riding for fun or curiosity stand out as the most frequently selected, followed by leisure and recreation.

When looking only at journeys that *have* been made (Figure 8b), the distinction between fun and curiosity (the bottom two options on the charts), on the one hand, and journeys with a 'purpose' (from A to B), on the other, is more pronounced. It is fair to say therefore that the vast majority of journeys so far have been for these purposes. Given the early stage of the trial and the context of a national lockdown, in which the need to travel to work, education or shops was greatly reduced, this is perhaps unsurprising. When looking at the potential for e-scooter use, whilst fun and curiosity still dominate the use cases, there is evidence that some people see themselves using them to get from A to B.

Figure 8c, in which the answers for male and female respondents are compared suggests that for all 'A to B' journeys, i.e., those with a purpose other than fun or curiosity, male respondents are more likely to consider them as reason for using e-scooters. Whilst female respondents are more likely to envisage using an e-scooter for fun or curiosity, they are less likely to use an e-scooter for *all* of the other purposes listed in the question.

When asked about the reasons for choosing e-scooters, as opposed to the purpose of the journey (Figure 9), curiosity was also the most frequent answer, again likely to reflect the novelty of the vehicles in the UK. This was closely followed by 'shorter journey time' and 'convenience', therefore demonstrating perceived advantages.

Our interviewees discussed the reasons they have used or would use e-scooters, some placing their transport decision within a bigger picture of climate change and sustainability. The context of Covid-19 and associated restrictions on movement and activities is relevant. One respondent made particular reference to using e-scooters out of curiosity in this context: *'because there's not much to do at the moment'* (SC). Another had noticed that students had been enjoying using the e-scooters during this time when little else was happening on the University campus, observing that it '*put a little bit of joy into their lives – there's a little smile on their face when they get on it*' (I7).

Another way in which Covid-19 shaped intentions towards e-scooters was highlighted by I1 and I10, who both expressed concerns about exposure to the virus on public transport and saw the scooters as a potential alternative to these. This survey respondent expressed this clearly: *'it would be something I would want to try out especially with me being able to socially distance as I am nervous to use public transport'* (SC).
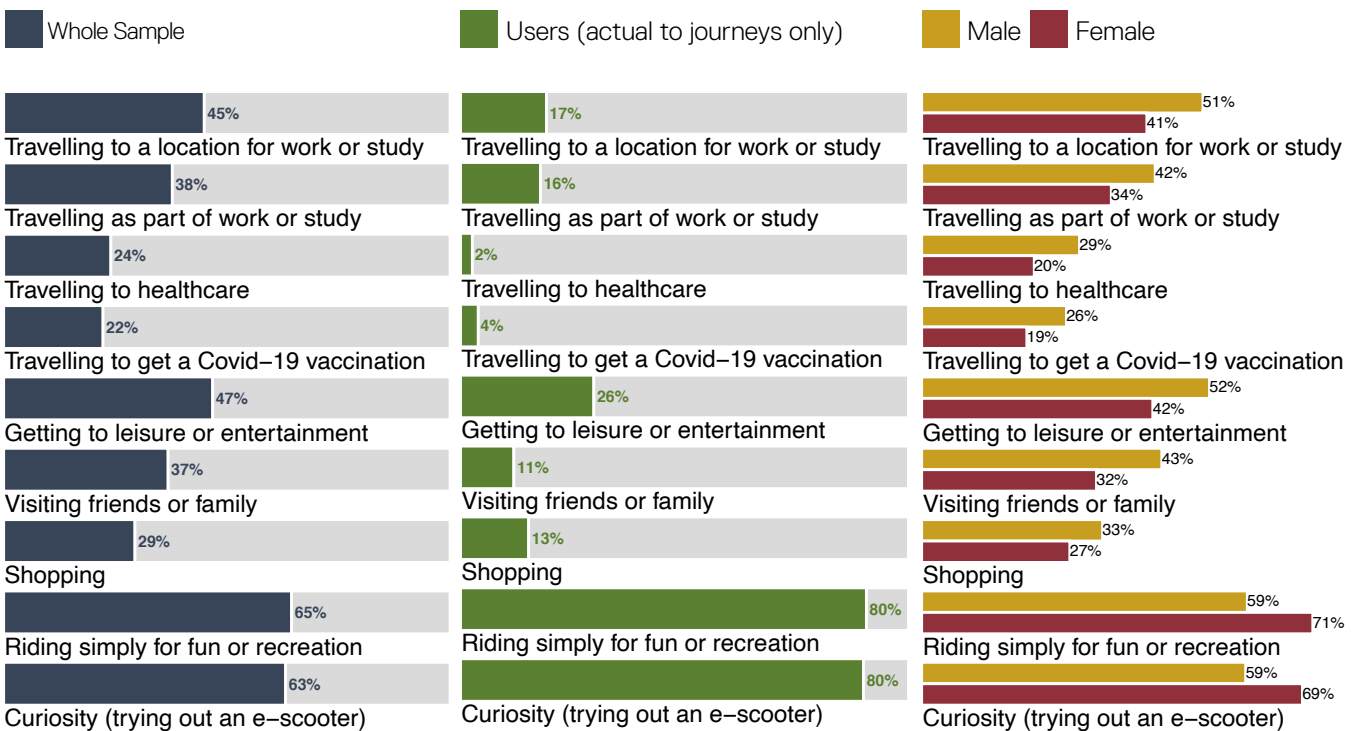

Figure 8 Stated purpose for e-scooter journeys. (a) envisaged journeys for whole sample, (b) actual journeys taken, (c) envisaged journeys by gender. (Q8, Q19, Q31, whole sample)

Use cases

Participants imagined ways in which e-scooters could fit into their transport practices and provide advantages when compared with other modes, and we can provide some examples here – reflecting a combination of journey purposes and reasons for choosing e-scooters. Examples include the potential to avoid being stuck in traffic when driving or taking a taxi to meetings (I2,3) and the possibility to supplement public transport use when routes do not go to the required destinations (I8,9). E-scooters offered a way of making journeys that was less likely to result in being sweaty when arriving at the destination: *'if I walk or cycle I perspire a lot, an e-scooter would take away the inconvenience of being damp and sticky for the rest of the day'* (SC).

For one interviewee (I5), e-scooters offered a potential mobility aid. She described an ankle condition that made walking difficult (I5). She was able to cycle to work, but walking around the site could be painful and an e-scooter could therefore provide an alternative. Another (I7) had enjoyed using the scooters for short trips around the University campus, choosing this mode largely for fun

and commenting on associated mental health benefits from the activity. I9 had used the scooters primarily for fun, though she could see herself using them as a regular commuting option, commenting that she would also like to be able to use them on country paths for recreation. Having recently moved to Greater Manchester (I2), e-scooters were a way of exploring some of Salford. I11 enjoyed architectural photography and felt that e-scooters offered a way of being able to tour an area and stop at times to take photos in a way that is more convenient than cycling, which has the associated need to stop, lock the bike and retrieve equipment from panniers. Another specifically mentioned travel to the gym (I4).

These examples indicate a range of envisaged use cases relevant to the respondents. In addition, there was some reference to children and teenagers using the scooters, although this would not be possible within the current trial. I1, for example, saw school travel to be a specific use case, seeing this as an opportunity to reduce crowding on school buses.
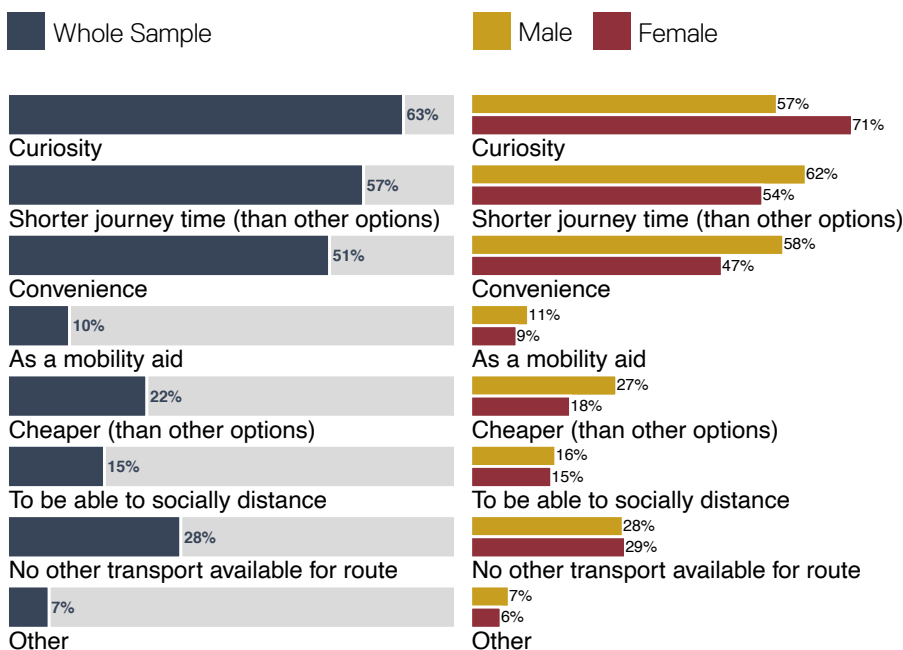

Figure 9 Stated reasons for using or potentially using e-scooters. (a) whole sample, (b) by gender (Q15, Q24, whole sample)

3.4 How are e-scooters experienced?

Figure 10 indicates a broad level of satisfaction amongst those who have already used the e-scooters in the Salford scheme. The per journey cost is the factor on which there is least satisfaction.

Understood in the context of this broad satisfaction, some interviewees recounted some challenges they had faced in using the scooters. I2 took the opportunity to use e-scooters with her partner to explore some of Salford. They were able to hire e-scooters through the Lime App, but were surprised that some e-scooters appeared to be available but were not showing on the screen. She admitted that she skipped over some of the introductory material designed to inform users before their first ride, but was confused during the journey about where they could ride, whether on the pavement or road. For this reason, they kept their journeys to the pavement, much of which was shared use for walking and cycling, and followed the indicated route.

She reports that the scooter 'cut out' several times on the route as they hit red zones and that the App cut out several times and needed to be rebooted. Having to rely on her phone to navigate was challenging, and she would have preferred to see more physical way markers to demarcate the route. A survey respondent also expressed this concern, noting the difficulty of navigating from the screen of a phone whilst scooting at the same time: 'the

'zones' are impossible to stay within when travelling on roads, and you cannot use your phone whilst riding to check you're 'going in the right direction' (SC) .

I7 enjoyed using the scooters frequently, but also noted that the Lime App had sometimes crashed during use. He also noted a few cases where the e-scooter being ridden had run out of battery with little notice. He also noted that he would prefer the designated parking and docking areas to be more clearly marked.

Issues with the operational area, or the geofence, were mentioned by others, both as a constraint on being able to use the e-scooters where they would have liked and as a factor that appeared to affect the experience of using them. This latter point reflects experiences of the scooters cutting out when manoeuvring around and to the edges of the operational area, as this survey respondent reflected:

> *The radius should be made a bit wider because every time it goes out of radius the scooter stops working and the only way to get it going again is to lock it and unlock it. This gets quite frustrating having to do it multiple times in the journey. (SC)*

This has affected the experience of riding, and it seems that this applied mainly to the route that links MediaCityUK and Peel Park campus, rather than within these areas. I10, for example, had used a scooter on the University campus, finding it easy to pick up a scooter and felt safe using it on the campus. This reflects the compactness of the operational area at this point in the project, which is to an extent an artificial, or short-lived,

Legend: Very dissatisfied | Dissatisfied | Neutral | Satisfied | Very satisfied

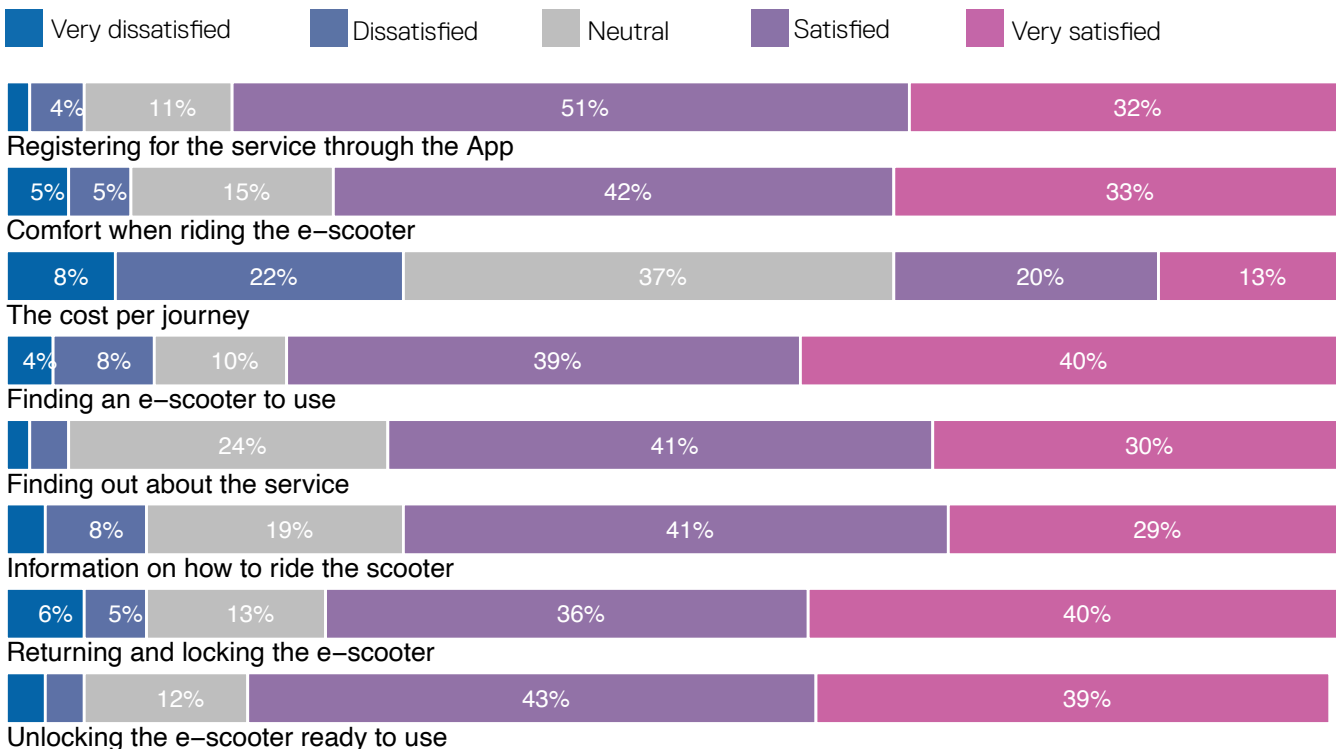| Aspect	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
Registering for the service through the App		4%	11%	51%	32%
Comfort when riding the e–scooter	5%	5%	15%	42%	33%
The cost per journey	8%	22%	37%	20%	13%
Finding an e–scooter to use	4%	8%	10%	39%	40%
Finding out about the service			24%	41%	30%
Information on how to ride the scooter		8%	19%	41%	29%
Returning and locking the e–scooter	6%	5%	13%	36%	40%
Unlocking the e–scooter ready to use			12%	43%	39%

Figure 10 **Satisfaction with listed aspects of e-scooter use. (Q14, Users)**

barrier: one that is likely to be alleviated as the scheme area is enlarged to cover more of Salford. It may transpire though that these issues affect users on the peripheries of a larger scheme.

3.5 How do e-scooters fit within transport practices?

Substitutions and combinations

Survey respondents were asked to think about how they might use e-scooters in relation to other modes. When asked which types of journeys they could see e-scooters replacing, journeys made by foot were by far the most frequently selected (Figure 11a). The answers do however suggest potential for substitution for other modes and it should be borne in mind that not everyone would have public transport or car journeys that could be replaced.

Figure 11b, which shows only those answers that relate to *actual*, rather than *potential* use, indicates that some people have already used e-scooters to replace journeys by other modes. Respondents were also asked about modes of transport they could combine with e-scooters (Figure 13), such as using an e-scooter to get to a public transport node. The picture is similar for these answers, with walking most prominent, but other modes also represented.

When these answers are unpacked by gender (Figure 11c), it is apparent that, with the exception of walking, men are more likely to say they will use e-scooters in combination or in place of other modes of transport. This is reflected in Figure 12, which gives the answers to the question 'Approximately how many of these trips would you have made by other means if an e-scooter was not available?', Although based on a smaller sample size (Users only), this indicates that male respondents were more likely to have used an e-scooter for journeys they would have otherwise made by other means, and that the opposite was the case for female respondents.

In the interviews and reference groups, we explored the ways participants would use e-scooters in relation to other modes of transport. They identified ways that e-scooters could replace other modes and be used in combination with them. In particular, e-scooters could offer a way of avoiding congestion in cars and crowded space on public transport. The latter is associated not only with inconvenience but also with risk of exposure to Covid-19. The potential for modal substitution was however contingent on a range of factors that may limit e-scooter use per se: that is, the potential to use an e-scooter instead of other modes is dependent on an e-scooter being a feasible option in the first place, as we discuss in Section 3.6.

Whole Sample — **Users (actual to journeys only)** — **Male** — **Female**

Whole Sample:
- Walking 73%
- Cycling 33%
- Bus 42%
- Train 13%
- Tram (including Metrolink) 27%
- Private Car 32%
- Taxi or Uber 35%
- Other 3%

Users (actual to journeys only):
- Walking 64%
- Cycling 19%
- Bus 18%
- Train 5%
- Tram (including Metrolink) 13%
- Private Car 14%
- Taxi or Uber 16%
- Other 2%

Male / Female:
- Walking 72% / 77%
- Cycling 36% / 32%
- Bus 45% / 40%
- Train 15% / 12%
- Tram (including Metrolink) 31% / 25%
- Private Car 38% / 27%
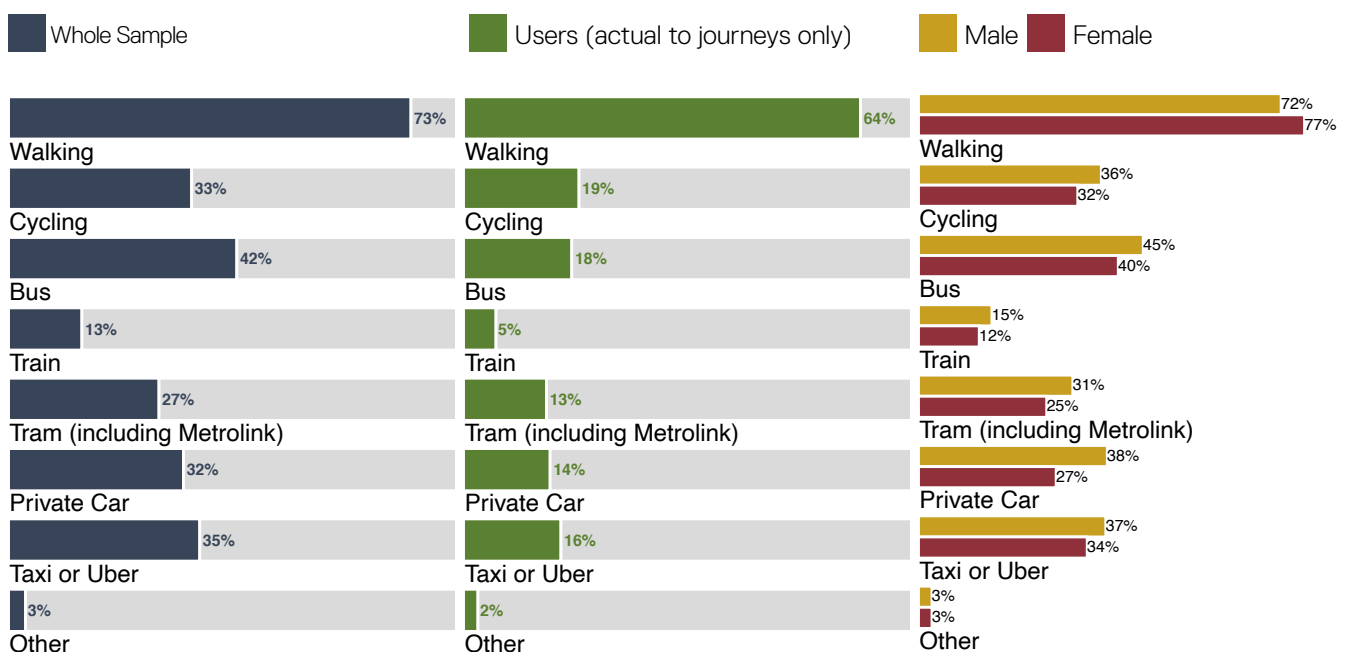- Taxi or Uber 37% / 34%
- Other 3% / 3%

Figure 11 Stated potential for mode substitution with an e-scooter. (a) potential substitution for whole sample, (b) actual journeys taken, (c) potential substitution by gender. (Q12, Q22, Q31, whole sample)

Whilst participants tended to see e-scooters to be suitable mainly for shorter journeys, there is a potential or the use of e-scooters in combination with other modes of transport to be transformative:

> *these could replace journeys which would otherwise be made by Uber and could encourage more active travel where there is currently a missing link in the journey - these could be the "middle mile" between walking/public transport. (SC)*

An experience of I2 draws attention to the importance of wider transport provision in enabling e-scooter use. She had taken the opportunity to use e-scooters with her partner to explore some of Salford. Their first challenge, of finding bike parking on the University's Peel Park campus highlights the importance of inter-modal connectivity.
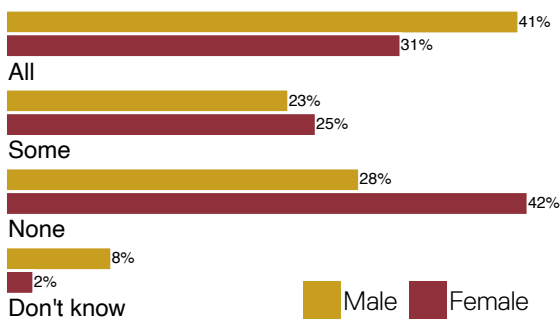
Figure 12 **'Approximately how many of these trips would you have made by other means if an e-scooter was not available?' (Q6, Users)**

Given that the scooters are currently available in only a small area, the transport connections to this starting point

are important. Looking ahead to when the scheme covers a larger area, usability may remain contingent on the quality of the cycling infrastructure, and in some cases an indirect e-scooter journey that tries to utilise disconnected or circuitous cycle routes may be slower than walking (I6).

Relationship with cycling

Several interviewees made comparisons between e-scooting and cycling, perhaps the mode most likely to be associated with e-scooting when taking into account speed and the part of the roads likely to be used. E-scooters, they observed, to some extent fill a similar role to cycling whilst providing a lower level of exercise and therefore potentially lesser health benefits. One interview did however mention the positive impact on his mental health of enjoying e-scooter journeys in the area around his workplace (I7).

Interviewees perceived there to be comparative advantages in e-scooters. I1, for example, saw there to be less need for specialist clothing when using an e-scooter and, when using hire schemes, less need to spend time on maintenance. I3 found e-scooters to be more practical when travelling between meetings for work, primarily by avoiding being sweaty. I4 anticipated feeling safer on an e-scooter than on a cycle given that they would be closer to the ground and have less distance to fall – *'there is a lot less that could go wrong than if you were on a road bike'*. I10 felt that the acceleration and ability to swerve instantly could help her get out of difficult situations and also noted that she would be able to stop immediately and jump if she felt unsafe. She did this once in fact, on an occasion when going downhill and the speed was slightly
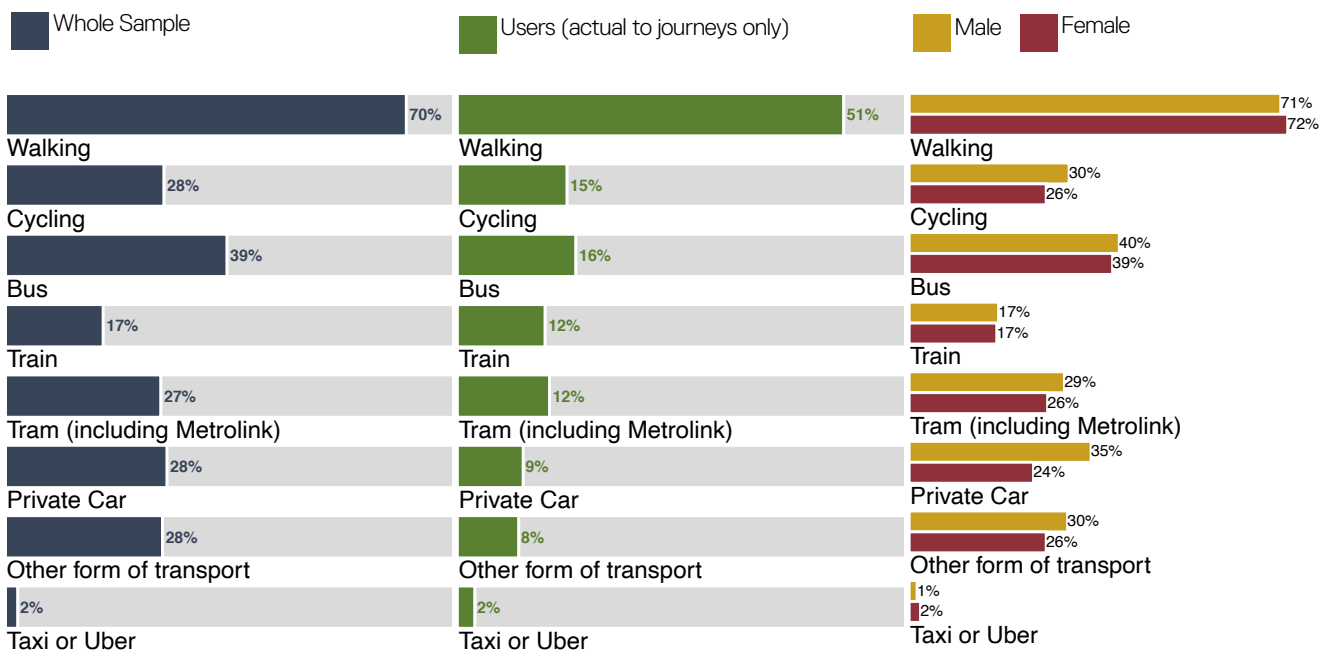
Figure 13 **Stated potential for combining other modes with an e-scooter in the same journeys. (a) potential combinations for whole sample, (b) actual journeys taken, (c) potential substitution by gender. (Q13, Q23, Q31, whole sample)**

higher than she was comfortable with. I4 felt that the lower ground clearance and shorter distance to fall would be beneficial.

It may also be the case that some people find the standing position more comfortable than cycling, as this survey respondent anticipated: *'I think I'll find it more comfortable than a bike, looking forward to trying one!'* (SC).

This perception of comparative safety was not universal, however: *'I wouldn't use e-scooters because - compared with a bike which I use a lot - they seem much less safe'* (SC). It may also be that people who cycle have a particular experience of the roads that gives them greater confidence on e-scooters. I7 raised this, mentioning that his experience cycling aided his ability to keep balance and cope with potholes and speed bumps. He also reflected, however, that he feels less visible on the roads on an e-scooter than he does on a bike, something also mentioned by I2 and that caused her to question the suitability of the scooters on the roads. It should be emphasised that these statements represent *perceptions* of safety and that further research is needed in order to be able to draw conclusions on comparative levels of safety.

There was an indication that the perceived similarity between scooting and cycling to some extent limits the potential for e-scooters to be an option for people who already cycle: *'I have a bike which meets my travel needs. I can't envisage many situations where I would prefer an e-scooter'* (SC); *'I like my Brompton bike too much'* (SC). For people who cycle, e-scooters may however have a role at times when cycling is considered less practical:

I'm a very experienced, confident cyclist and will often use a bike to get around the city. This changes when I'm attending business meetings when I'm reluctant to cycle in a suit so I would usually either walk or get public transport. With the right shared infrastructure e-scooters look like exactly the right solution to make my transport easier. (SC)

3.6 What factors might limit e-scooter use?

Road safety

Figure 14 summarises the answers to the question 'How likely are each of the following to limit how much you use e-scooters?', Intended to gain an understanding of the factors that might mean that people are using or will use e-scooters less than they might like to. It shows the total percentages of respondents who indicated that each factor was 'likely' or 'very likely' to limit their e-scooter use. It implies that the most significant barrier to use is, by a wide margin, concern about road safety. This is followed by the cost of e-scooter use and concern about anti-social behaviour.

Gender

When breaking this down by gender (Figure 14b), we can see that female respondents were more likely to say their use would be limited by most of these factors, the main exception being cost. The difference in the effect of road safety and personal safety concerns are particularly

Whole Sample | **Male** | **Female**

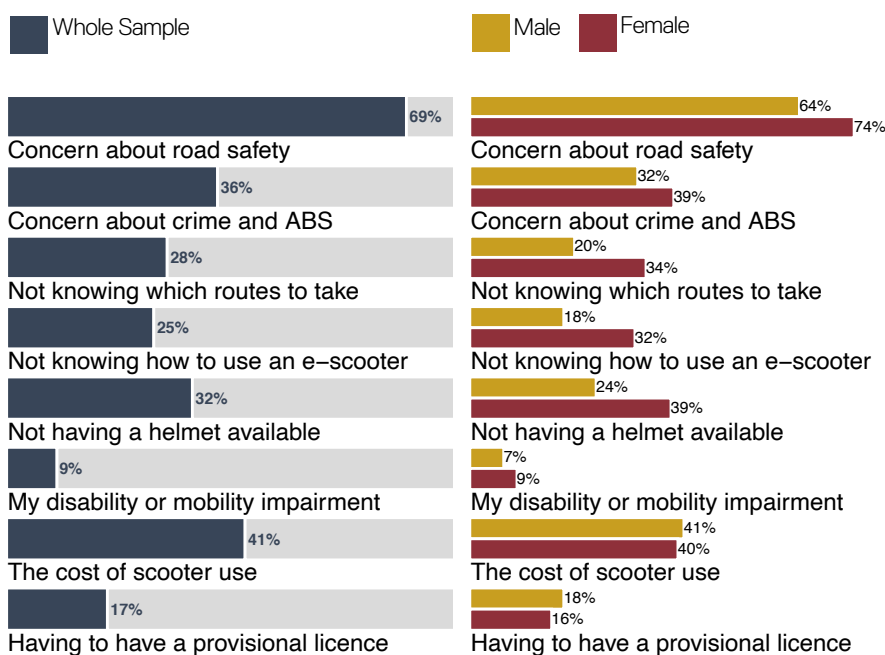| Factor	Whole Sample	Male	Female
Concern about road safety	69%	64%	74%
Concern about crime and ABS	36%	32%	39%
Not knowing which routes to take	28%	20%	34%
Not knowing how to use an e–scooter	25%	18%	32%
Not having a helmet available	32%	24%	39%
My disability or mobility impairment	9%	7%	9%
The cost of scooter use	41%	41%	40%
Having to have a provisional licence	17%	18%	16%

Figure 14 'How likely are each of the following to limit how much you use e-scooters?' (a) whole sample (b) by gender (Q25, Q31, whole sample)

pronounced, as are the related issues of knowing what routes to take, knowing how to use an e-scooter, and having a helmet available.

It is well established in cycling literature that female road users are more likely to be concerned about and deterred by perceptions of danger in traffic (Shaw et al., 2020) and there is a growing evidence base on women's experience of harassment in public spaces (APPG for UN Women, 2021).

The difference in perceptions around e-scooters may have a common root. It is worth noting that in our sample 31% of female respondents said that they cycle as part of their regular journeys, compared with 53% of men. This implies that male respondents are more likely to already be confident cycling on the road, and that this confidence may transfer to e-scooting. Whilst this might imply an imbalance in our statistics, it is established that in Greater Manchester more men than women cycle (Sustrans, 2019) and our sample and the trends arising from it could therefore reflect the reality – that is, the factors that mean that women are less likely to cycle also impact upon their potential use of e-scooters.

Unpacking safety concerns

Looking across the user categories in Figure 15, it also appears that the e-scooter take up of Avoiders and Deciders are more likely to be affected than that of Users by a number of these issues. These include concerns about road safety and anti-social behaviour as well as helmet availability and knowledge of how to use an e-scooter. This implies that these concerns could influence their willingness to use an e-scooter.

Our discussions illustrated some of these concerns. Whilst some of the interviewees and reference group participants did cycle as part of their transport practices,

others were not confident to cycle in traffic and made a connection between this and their sense of safety when using an e-scooter in traffic. I8, for example, referred to having seen segregated infrastructure in Copenhagen and observed that this works well to make people feel more confident on an e-scooter, but in Greater Manchester she has found that cycle lanes allocations are not enforced and are often blocked by parked cars. She specifically referenced a fear of cycling that she would have to overcome and associated this also with any potential use of e-scooters.

Other road users

A number of people commented on the difficulty of allocating space for e-scooters, feeling that they might pose a risk to pedestrians on pavements and that riders might feel in danger from traffic on roads:

> *These scooters develop very high speeds and so pose a risk for pedestrians. However on the road they put themselves in danger as they are at risk of colliding with cars. Considering Salford is not [a] leader in cycle lanes, I am not sure what the space for the scooters currently is. (SC)*

> *I also feel as though the emergence of e-scooters has been good in flagging up the lack of active travel infrastructure within cities and how this urgently needs to be addressed (a 16-year-old on an e-scooter shouldn't have to choose between being a nuisance on the pavement and being vulnerable on the road, there should be more segregated infrastructure). (SC)*

Whilst concerns around safety in traffic resonate with the corresponding and often-cited barrier to cycling, I10 implied that is also the case that people cycling could themselves be an issue for e-scooters, arguing that she finds that people cycling can be 'quite scary':
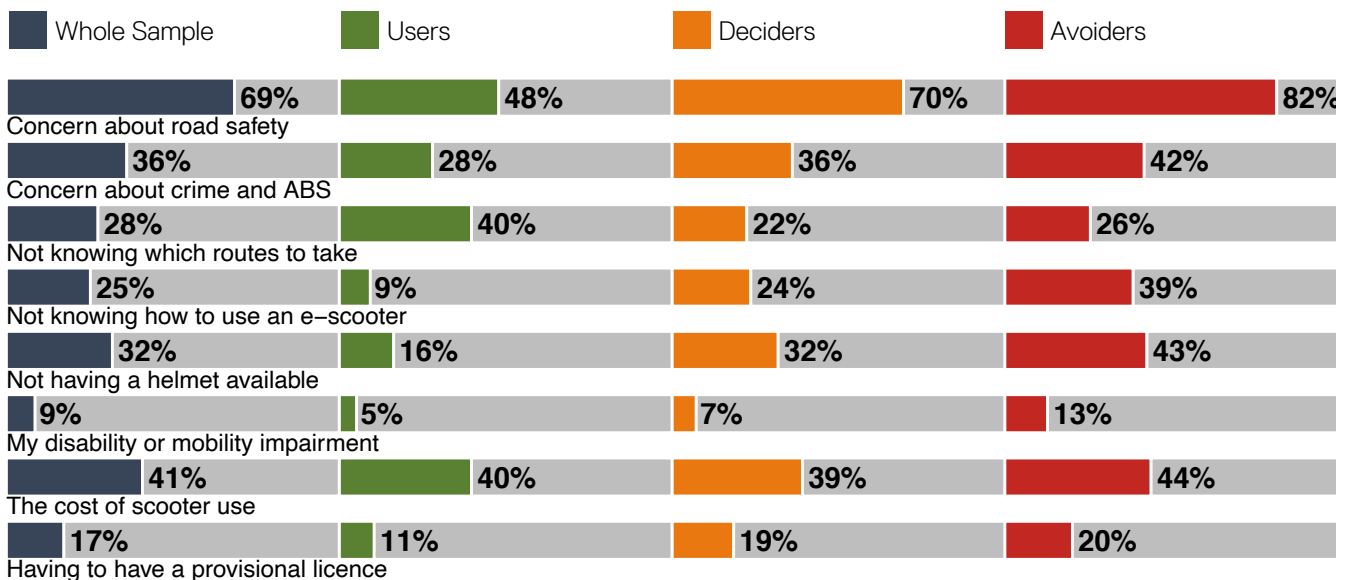
	Whole Sample	Users	Deciders	Avoiders
Concern about road safety	69%	48%	70%	82%
Concern about crime and ABS	36%	28%	36%	42%
Not knowing which routes to take	28%	40%	22%	26%
Not knowing how to use an e–scooter	25%	9%	24%	39%
Not having a helmet available	32%	16%	32%	43%
My disability or mobility impairment	9%	5%	7%	13%
The cost of scooter use	41%	40%	39%	44%
Having to have a provisional licence	17%	11%	19%	20%

Figure 15 **'How likely are each of the following to limit how much you use e-scooters?' (Q25, whole sample)**

I would love to be able to use them on the pavement to be honest, that would be my ultimate - because cyclists can be quite scary as well to be honest - with their £4000 platinum bike and their lycra and they're all very serious, so I think there's a little bit of community snobbery going on there, so I'm not sure as I say how they would feel about us in our little scooters coming along. (I10)

Our conversation implied that there was not a full understanding or awareness of where e-scooters should be, whether on road or pavement. This likely reflects the relatively recent launch of the scheme and the other UK trials. Whilst some did comment that pavements might be safer for riders than roads, some (I2,8) specifically mentioned being concerned about being a threat to pedestrians, given the ability to move quietly and speedily. One person reflected on the challenge of social distancing on pavements, observing that it is easier to move out of the way when walking than it is when riding an e-scooter.

Personal safety

In Reference Group 5, participants discussed the potential for people to be more visible when riding an e-scooter than they would when cycling and therefore make them, particularly female riders, targets for harassment. This connects with the experience of I5 who recounted that she would avoid choosing to cycle through some parts of Salford after experiencing aggressive behaviour by a group of young men. A survey respondent raised a similar concern: *'They are a nuisance on the public footpaths, perfect for robberies as you cannot hear them coming'* (SC).

Conversely, the participants in Reference Group 5 also recognised a potential for services like shared e-scooters to provide an option to feel safer at night, in comparison with walking. In this context, e-scooters could also provide an alternative to public transport and avoid the need to wait at transport interchanges and taxi ranks. This survey respondent's comment reflects this potential: *'I would use e-scooter at night in unsafe areas, as walking in such areas is more risky. Slower speed of walking make[s] people more vulnerable and available to attacks'* (SC).

Training

Related to safety, or at least to confidence, is the potential for training on how to use an e-scooter to be made available. Half of respondents felt that being able to receive training on how to use an e-scooter was at least 'somewhat important', and 15% thought it 'very important'. Being able to receive training on riding in traffic was at least 'somewhat important' to 56% and 'very important' to 21%. Training is an issue that was discussed in RG4, as participants felt that the availability of training, and potentially the requirement to partake in it, would make public space safer for vulnerable people.

Cross Lane, part of the route between Peel Park campus and MediaCity UK
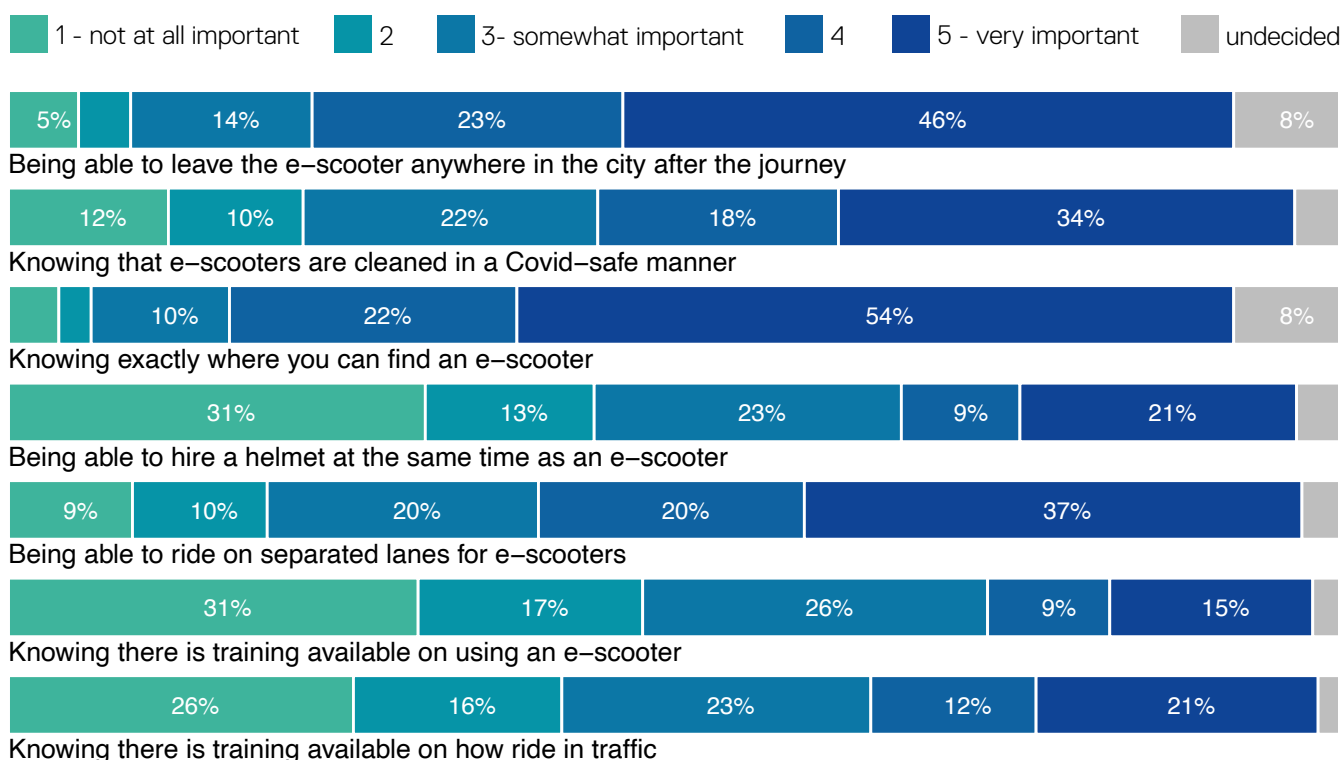
■ 1 - not at all important	■ 2	■ 3- somewhat important	■ 4	■ 5 - very important	■ undecided

5%	14%	23%	46%	8%

Being able to leave the e–scooter anywhere in the city after the journey

12%	10%	22%	18%	34%	

Knowing that e–scooters are cleaned in a Covid–safe manner

		10%	22%	54%	8%

Knowing exactly where you can find an e–scooter

31%	13%	23%	9%	21%	

Being able to hire a helmet at the same time as an e–scooter

9%	10%	20%	20%	37%	

Being able to ride on separated lanes for e–scooters

31%	17%	26%	9%	15%	

Knowing there is training available on using an e–scooter

26%	16%	23%	12%	21%	

Knowing there is training available on how ride in traffic

Figure 16 **'How important are each of the following factors to you when deciding whether to use an e-scooter?' (Q26, whole sample)**

Access to helmets

Helmet use when cycling is a complex issue, and this research suggests that this is also the case for e-scooters. In the UK, helmet use is mandatory for neither cycling nor e-scooting. Whilst some argue that helmet use when cycling should be mandatory in order to protect users (Walker, 2017), others point to limitations in a cycle helmet's ability to protect at speed (Schleinitz et al., 2018) and to a tendency for helmet laws to add a barrier to cycling. In making it appear more dangerous, they could lower the number of people cycling (Rissel and Wen, 2011) and therefore increase the risk to those who do cycle[12]. In share schemes, helmet provision is a particular challenge (Sherriff et al 2020), since individuals either need to carry a helmet just in case or scheme providers need to somehow ensure the availability of helmets in a hygienic and, currently, Covid-safe way. A growing market in foldable and collapsible helmets may help to meet this need[13].

Whilst some commentators argue that helmets are not necessary and argue that the most effective way to ensure safety is to address traffic levels and driver behaviour, our survey indicates that helmet availability may be a concern and a potential barrier to the use of an e-scooter share scheme. Around a third of respondents indicated that 'not having a helmet available' was likely to limit how much they use e-scooters, and this was much more likely to be a factor for female respondents than male. It was also more likely to be the case for Deciders

than Users and Abstainers than Deciders (Figure 15), indicating that it may be a factor in willingness to use the scheme. In practice, 78% of those who have used the scheme so far had not used a helmet for any journeys.

The comments from our research participants reflect this complexity. I10 would like to have a helmet available when using a scooter but recognised the challenge in providing them, particularly in the context of Covid-19. She reflected that she would probably buy a helmet for herself if she were to use an e-scooter regularly. Other comments reflected the range of opinions on this issue:

> *... don't agree with having to wear a helmet when riding an e-scooter, given the relatively low speeds - this is a barrier to use and sends out the wrong message about safety, when the focus should be on dangerous motor vehicles (same argument why I don't wear a helmet when I ride a bike). (SC)*

> *Helmets must be made mandatory for both cyclists and e-scooter users, the number of cyclists who simply do not wear a helmet or [don't] use cycle lanes when they are available is crazy - I know this is about e-scooters but the same issues will arise. (SC)*

12 https://www.cyclinguk.org/campaigning/views-and-briefings/cycle-helmets
13 https://cycletraveloverload.com/a-buyers-guide-to-foldable-bike-helmets-are-collapsible-bike-helmets-safe/

> *I think people should wear helmets but I think this might put people off from using them. (SC)*

Additionally, these comments relate to e-scooters specifically and the potential additional risk, in comparison with cycling:

> *I think it is ridiculous that people are completing this journey without a helmet. If you're not paying constant attention to the road, you can easily lose total control when hitting a bump or pothole. Helmets should be mandatory for this journey and should be available to hire with the scooter. (SC)*

> *I would only use them on the road if they can go at least up to 20 mph to keep up with motor traffic and come with helmets - in which case they would be a replacement for petrol scooters/ mopeds or a road bike. (SC)*

Operational area (Geofence)

The operational area of any share scheme is clearly an important characteristic in that it determines where people can go on the e-scooters and therefore the usefulness of the scheme as a whole. Respondents commented on the small area covered by the scheme at the time of the survey, reflecting that this limited the extent to which they could use the scheme for their journeys. This is clearly a reflection of the early stage of the scheme, and provides some indication that it will become relevant to more people as it is expanded to encompass more of Salford. Two interviewees (I7, I10), mentioned potential connections with Manchester, such as to the train stations and the Oxford Road corridor for example, and that the focus on Salford may be at the expense of the opportunity for e-scooters to be used to connect with facilities in Manchester, including to link across the regional centre. This is reflected in this survey response:

> *Also the very limited geographical areas the scooters can be currently used in has limited when I use them. I would use them more if you could use them in a bigger area of Salford/ Manchester. I think it would be great if you could use the scooters in Manchester as well as Salford eventually as most of the time I am travelling between the two for work and so if you can't take the scooter into Manchester then [it] that is not an option. (SC)*

Two other issues relating to the operational area were mentioned. Firstly, users commented on the ways the scooters behaved at the margins of the current scheme and noted their experiences with the motor cutting out unexpectedly – *'The radius should be made a bit wider because every time it goes out of radius the scooter stops working and the only way to get it going again is to lock it and unlock it'* (SC).

Secondly, they referred to the difficulty of using a map on their phone screen to navigate whilst riding and suggested that it would be helpful to have more signage in place to indicate where the scooters could and could not be used – *'you cannot use your phone whilst riding to check you're 'going in the right direction'* (SC). I9, for example, had not realised that the e-scooters could not be ridden in Peel Park itself and found himself having to push the scooter back up the hill after unknowingly leaving the geofence. Both of these issues provide some substance on the user experience, and both reflect to some extent the very limited nature of the operational area at the time of the survey.

Cost

The survey responses indicate that the cost of e-scooter use could be a factor that limits use (Figure 14) this was the only element of use about which more Users were dissatisfied than not (Figure 10). Comments about costs were made by survey respondents, giving a sense that scooter use is perceived to be expensive and that this may be a barrier to use.

Cost is of course relative, and respondents gave examples of ways they would calibrate the cost in relation to the other options available to them: considering the cost relative to driving, buses, taxis and cycling. Perceptions of cost therefore relate in part to current practices, and for some, saving money would be a motivating factor – around a fifth of respondents selected this from a list of potential reasons for choosing to use an e-scooter (Figure 9). In particular, respondents could foresee e-scooter use being cheaper than driving or using public transport in some cases. Whilst the per-journey cost is higher than cycling (on a privately owned bike), it was noted that e-scooters may likely have lower maintenance costs, whether used through a share scheme or when privately owned (I1), and may require less equipment. Respondents also reflected on the potential of owning a private e-scooter: whilst this might be preference for some people, it may also be easier to justify the cost of using a shared scheme on a per-journey basis (I2).

3.7 What concerns and priorities are evidenced?

The Greater Manchester context

Our discussions indicate that the city region's relatively recent experience with micromobility, the Mobike dockless bike share system (Sherriff et al, 2018), may to some extent shape perceptions and expectations of Lime's scheme. Whilst the evidence to date suggests that this scheme has not been subject to anywhere near the level of theft and vandalism that the Mobike bikes were, our respondents were concerned that incidents of anti-social behaviour in relation to the bikes may increase as the scheme is rolled out and that this would have implications for the quality of the service and the extent it impacts on space more generally.

These survey comments indicate some of this concern:

If they can be left anywhere, they will end up littering the city. It could be similar to the Mobike fiasco of a few years ago (SC);

It would be amazing for them to be everywhere in Manchester, but I'm concerned after how Mobike were sadly treated it might not go well (SC).

Covid-19

Introduced in autumn 2020, during a time when working at home was still common and shortly before further national lockdowns from late December that year, the use and potential use of the e-scooter share scheme should be understood within this context. This survey respondent commented, for example, on the ways in which lockdown limited potential scooter use, hinting that the scheme will be more relevant to them in the future:

I would have used the scooters more since the scheme launched but with Covid restrictions etc we have spent most of that time in an 'essential trips only' mode and so have not used them due to this. As Covid restrictions lift I anticipate using them more now that we are allowed to. (SC)

Participants recognised the potential role of e-scooters in the pandemic, as a means of individual travel without the impact of car use or the exposure risk of public transport:

E-scooters are affordable in price, it's clean energy and zero emissions, a modern mobility system indeed, especially with the Covid 19 pandemic, a safe alternative for public transportation and social distancing. (SC)

There was recognition that the scooters offered a chance to socially distance *'it would be something I would want to try out especially with me being able to socially distan[ce] as I am nervous to use public transport as of current'* (SC). One interviewee, however, expressed concern that she had found it more difficult to socially distance on the pavement when using an e-scooter than she would if she had been walking. Whilst the scooters are not intended for use on the pavement, this may be an issue for some in shared spaces such as a combined walking and cycling lanes. Most respondents placed importance on the scooters being cleaned in a Covid-safe manner (illustrated by a comment that *'wipes and gel should be provided to make them covid safe'* (SC).

Sharing Space

Participants expressed concerns about sharing space with pedestrians. Although it is not legal to ride e-scooters on the pavement and these comments may to some extent indicate that people are not currently aware of this, they also appear to reflect concerns that the scooters may in
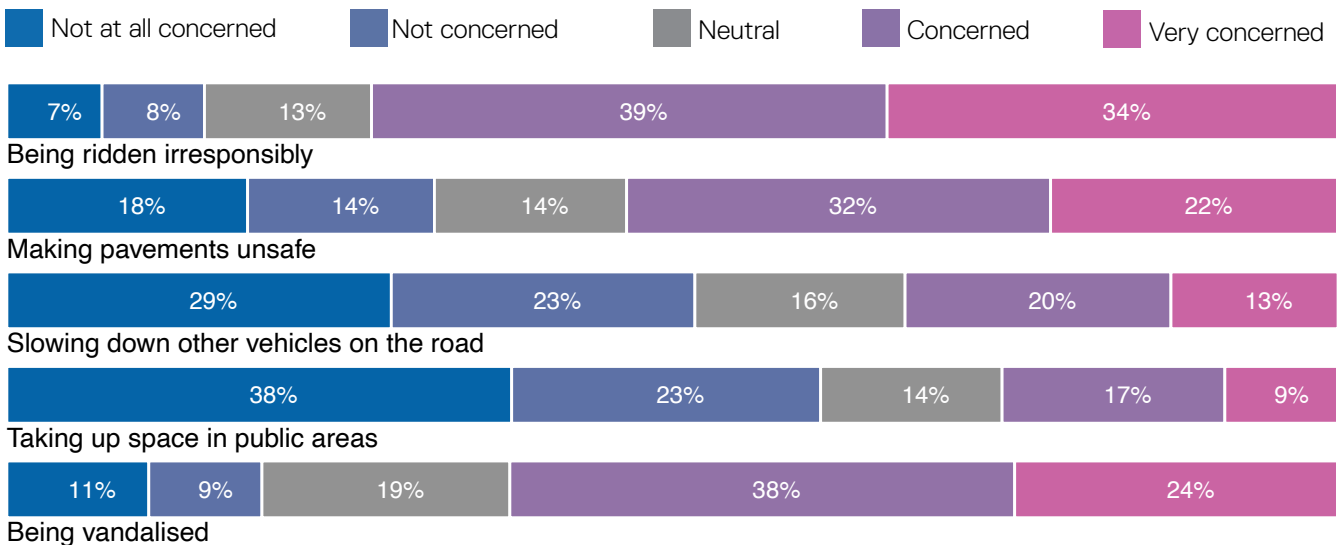
Not at all concerned	Not concerned	Neutral	Concerned	Very concerned

7%	8%	13%	39%	34%

Being ridden irresponsibly

18%	14%	14%	32%	22%

Making pavements unsafe

29%	23%	16%	20%	13%

Slowing down other vehicles on the road

38%	23%	14%	17%	9%

Taking up space in public areas

11%	9%	19%	38%	24%

Being vandalised

Figure 17 **'For each of the following, how concerned are you about the potential impact of e-scooters in your area?'** **(Q27, whole sample)**

any case be ridden on the pavements and that there may be interactions between people walking and scooting at other points, such as crossings.

There is evidently some confusion over where the scooters are permitted. I2 commented, for example, that they stuck to pavements and cycle paths as they were not sure if they were allowed to go on the roads – '*I'm confused how this trial works if it's illegal to use them on the road' (SC)*. She commented that this had not been made clear, but also noted that she had skipped over some of the introductory information when setting up the App. It may also relate to a perception that e-scooter riders themselves would be more at risk on the road: I10 reflects that she would prefer to use the scooters on the pavement as other road users, including others in the cycle lane, can be quite 'scary'.

A perception that e-scooter use may involve on-pavement use may act as a deterrent. I6 noted how quiet the vehicles are and that they might put other road and pavement users at risk, and I8 felt that she would personally have no issue with using the scooters on the pavement but would not want scooters to cause issues for people walking, in the way that cycle use can. This was an issue that resonated for participants of Reference Group 4 in particular, who identified different ways in which people walking might be impacted by e-scooters.

For deaf, hard of hearing, blind or visually impaired people, and people with autism, there could be challenges in sharing space with e-scooters, potentially causing the pavement to become a hostile area, whether the scooters are being ridden or are parked in the way where people want to walk. People with mobility impairments and wheelchair users might struggle to take evasive action necessary if e-scooters were moving towards them at speed, and have difficulty manoeuvring around parked or stored scooters and this is also likely to be the case (RG3) with older people. They therefore emphasised the importance of clearly demarcating and enforcing parking in specific places.

To some extent, participants in Reference Groups 3 and 4 associated these risks with the newness of the scheme, observing that the short amount of time it has been running, coupled with the nature of lockdown and the implication that people are using the streets less, means that there is likely to be low awareness of the scooters and therefore people are less likely to be anticipating interactions with the scooters.

It is also worth noting, that people in the reference groups also referred to people using privately owned e-scooters. Although these are not part of the study and are currently illegal in public spaces, their use will have influenced the views of participants towards e-scooters in a more general sense.

Whilst not an issue we specifically asked respondents about, there was an implication that the image of the riding an e-scooter may be a factor for some people:

> *I'd probably try one just to see what they were like but not really convinced they'd be that good because I'd probably just use them for distances I could walk but walking would be cheaper & I wouldn't be worried about looking or feeling stupid when walking (SC)*

Driving Licence Requirement

Under the rules of the Department for Transport trial of e-scooters in the UK, users have to hold a full or provisional driving licence. The views of respondents on this requirement varied. They expressed concern that this requirement would exclude people, including teenagers, who might benefit the most from the being able to use the vehicles - '*No over 18s and the requirement for a driving licence excludes many people (if not majority) who would be likely to use the scooters'* (SC). There might otherwise, for example, be an opportunity to make more use of e-scooters for travel to school with benefits for congestion and overcrowding:

> *I think it's a shame that you need to have a provisional driving licence to ride one because I think they have been used (illegally) by school children to get to school who would not be eligible to use e scooters under this ruling. This is particularly a shame given how crowded school buses are as it will make the kids more dependent on their parents to get them to and from school. (SC)*

A survey respondent referred specifically to the driving licence requirement as excluding them from the share scheme:

> *An e scooter would be a great alternative for me but, because I don't have a smartphone or a provisional driving licence, I'm pretty much excluded from using one. As such, I will stick to walking, the bus and figuring out if I can make it easier to fold and store my existing scooter. (SC)*

Another respondent argued, on the grounds of equivalency, that a licence should not be required, since e-bikes do not require one.

Conversely, some respondents welcomed the driving licence requirement as a way of enforcing an age limit – '*Wouldn't want to see 9-year-old kids on e-scooters (for their own safety), so there should be an age limit - and the easiest way to do this currently is through having a driving licence*' (SC) – and encouraging a level of responsible ridership on the grounds that users would be identifiable and likely have some training and experience in relation to using the roads. To some extent, this reflected prior observations of e-scooter – '*There are hundreds around being ridden irresponsibly and no enforcement of existing legislation*' (SC). Reference Group 4 participants saw the driving licence requirement as a way of ensuring more responsible e-scooting, given that it means that irresponsible riding could result in points on the licence (I2).

4. Conclusions

4.1 Summary

Our study

Our study provides an initial picture of experiences and perceptions of the Lime e-scooter trial share scheme in Salford. It provides a baseline and foundation for subsequent stages of the study and identifies issues and challenges pertinent to the scheme as it develops. Researching e-scooters is both a challenging and intriguing undertaking. Whilst most closely associated with walking and cycling, e-scooters have no direct equivalents. People have little awareness of e-scooters as a form of mobility and, as shared e-scooters are a new form of transport in Greater Manchester, this study is an opportunity for people to rethink their own mobility practices and the role these new vehicles could have in their travel patterns, both independently and multimodally.

The context

The Lime e-scooter share scheme trial has commenced during a period of unprecedented restrictions on mobility across the country, with the Covid-19 lockdown meaning working from home has been common, and shops, hospitality, sports and entertainment facilities have been closed. People therefore have had less need to use transport, including e-scooters, and since they were less likely to be outside, they were less likely to observe e-scooters in the public realm. Coupled with the small operational area of the scheme, it is likely that few people saw or had cause to use the e-scooters. For this reason, we designed the study to look at *potential use* as much as *actual use*.

There are two other important aspects to the context of this research. Firstly, despite the fact that it is illegal in the UK to ride privately owned scooters on public land, use of these vehicles is in evidence around the city, and becoming more visible. Perceptions of and attitudes towards e-scooters are likely, then, to be influenced by these vehicles as well as the Lime e-scooters.

Secondly, the dockless bike share scheme, operated across the city region by Mobike in 2018, was subject to some high profile operational issues and cited anti-social behaviour, particularly theft and vandalism, as reasons for its closure (Pidd, 2018). Our research indicates that this scheme has left its mark on the public imagination and that these prior experiences may mean that concerns about e-scooters being used irresponsibly may therefore be more pronounced than they would otherwise be. Lime have put in place measures to reduce the likelihood of irresponsible use including speed limiting in shared areas, no-ride zones in which the e-scooters are powered down,

and designated parking zones, but it may take time for the public to be reassured that this will result in fewer incidents of dangerous riding and less cluttering of the pavements with the vehicles.

Operational Area (Geofence)

As with all forms of shared micromobility, the operational area, defined by the geofence, is essential in positioning the scheme as a legitimate form of transport for potential users. Our research has begun to identify different journey types as the trial scheme has expanded from the University of Salford campus to MediaCityUK, reaching more people and developing a broader offer for potential users. We have also identified an appetite for the share scheme to cover a larger area, including connectivity with the regional centre, and found that people envisage the scheme to be more relevant to their travel practices if more of Salford is covered by it. We will be examining how these journey types continue to evolve as the scheme expands even further across Salford throughout 2021.

Use of e-scooters

Our research shows that some people have begun to use the e-scooters on and between the University's campus and MediaCityUK. From the list of options we present in the survey, the vast majority of use cases so far have been for fun or curiosity and this is unsurprising given both the novelty of the scheme and the nature of the lockdown restrictions. When asked to think about potential use, however, respondents evidence ways in which e-scooters could fit into their mobility patterns, including in some cases using them in place of other modes or in combination with them, in the form of mode chaining.

The Covid-19 context is relevant, and the potential for e-scooters to provide an alternative to crowded public transport was recognised. One respondent noted, however, that social distancing in crowded shared spaces might be more difficult on an e-scooter than when walking as a result of the challenge of moving around crowded spaces and avoiding close proximity.

Cost

The relationship with cost was complex and is of course relative to the other modes of transport available: some saw them as opportunities to save money by substituting them for driving or public transport, but many found the per journey cost to be off-putting. This is clearly relative and depends how one might otherwise travel: more

expensive, per journey, than walking and cycling, but potentially cheaper than public transport, driving or taxis and similar services.

The geofence is also a consideration here. It may, for example, be faster to scoot to MediaCityUK than walk or cycle, but if the final destination is further afield, the remaining part of the journey may need to be walked, causing overall journey time to be slower than cycling. These additional considerations may influence how users perceive the total cost of their journeys.

Social inclusion

Our survey indicates that younger people are likely to be more open to the idea of using e-scooters. They are also more likely to have used them in the trial so far. The trend in our responses is for women to be less likely to see themselves using the scooters for journeys from A to B, as opposed to using them for their own sake, and, relatedly, less likely to substitute e-scooters for other modes. They are also more likely to see road traffic and personal safety concerns as factors that would limit their use of e-scooters, and to say that difficulty accessing a helmet would make them less likely to use an e-scooter in a share scheme.

There is also some indication that the requirement to use a smartphone to unlock the e-scooters could for some be a barrier to access. This is partly a reflection of the cost of smartphone ownership per se and also of the likelihood of people on lower incomes having phones with less storage and mobile data availability, meaning that the requirement to download an App, potentially at the point of use, may mean it is not feasible for them. Lime have been developing an 'app-less'[14] approach that, whilst still requiring a smartphone, removes the needs for an App to be downloaded. This feature is currently only available in the USA.

The data also suggests that people who do not have access to a car or cycle are more likely to have used an e-scooter and more likely to be open to using one. This is encouraging from the point of view of social inclusion, given that it may be providing an opportunity for people without private transport to make journeys, but perhaps less encouraging from the point of view of sustainability and modal shift, since it questions the extent to which e-scooters use is replacing car journeys.

Road and personal safety

Perceptions of safety vary. For many, concerns about safety in traffic are a limiting factor, but some respondents identify ways in which e-scooters may have some safety benefits when compared with other modes. Being closer to the ground, having less distance to fall, and the ability to step off more quickly, were perceived advantages over cycling. Others commented, however, that the scooters feel less safe, due for example to the smaller wheels.

It is important to recognise that these points reflect perceptions of users and potential users, and that further research is needed to fully understand relative safety. There was some sense that people who already regularly cycle would benefit, when using e-scooters, from the experience of manoeuvring in traffic and navigating potholes and speed bumps.

In the case of personal safety, some saw e-scooters as a mobility option that could provide an alternative to walking home at night or waiting at public transport interchanges, and therefore reduce the risk of harassment and attack, something that was discussed in the women's reference group. Conversely, there was concern that the novelty of e-scooters could be a factor in drawing attention to riders and make it more likely that there would be abusive behaviour towards them.

Vulnerable road users

Vulnerable road and pavement users saw some potential for e-scooters to act as mobility aids, providing a way of getting around for people who might otherwise be unable to walk or cycle long distances, particularly if this meant they could combine the scooters with other modes. These participants, however, expressed concern about the impact of e-scooters on their own personal mobility when using pavements and shared spaces. Going forward, there is a need to find ways to ensure that e-scooter uses do not put members of the public at risk or inconvenience and that parking the vehicles does not impact on the ability of people to use pedestrian or shared spaces.

4.2 Further research

This interim analysis provides a starting point for more in-depth investigation into the use of e-scooters and the ways in which the vehicles are experienced and perceived. As the share scheme is rolled out to cover a larger area of Salford, e-scooters will be visible to many more people and more relevant to their travel requirements. This will particularly be the case as Covid-19 restrictions are lifted and the city comes out of lockdown, meaning people are more likely to see the e-scooters in public spaces and have reason to use them for travel to work, study and leisure and social life. We will continue to examine e-scooter use through surveys, interviews and reference groups as the scheme continues to expand. We have identified the following areas of enquiry as likely to be relevant as our study progresses:

- **Development of the scheme** How will e-scooter use develop over the coming months as the national context changes and people have more reason to travel? To what extent will people begin to use e-scooters for the journey purposes they identify in our study and what patterns will we observe in relation transport mode shift? As the geofence changes to include more intersections with public transport services, to what extent is mode chaining evident?

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14 https://www.li.me/second-street/lime-rolls-out-app-less-riding-to-cities-around-the-world

■ **Impact on mobility practices** How does e-scooter use impact upon other mobility practices? Do individuals use e-scooters for an increasing proportion of their journeys? Does this experience of using micromobility lead to more interest in walking and cycling, perhaps taking up, or returning to cycling? Do users intend to invest in their own e-scooters if it becomes legal to do so?

■ **Helmet availability and use** We have found that some people could be deterred from using the e-scooter sharing scheme if they are unable to access a helmet at the time of renting a scooter. Our evidence implies that this relates to perceptions of safety, but it is not currently clear if this stems from concern about traffic in a general sense, or if it responds to specific concerns about the inherent safety of e-scooters.

■ **Health** Can e-scooters be classed as an active form of transport? Is there any benefit to health when using an e-scooter?

■ **Sharing and ownership** The novelty of e-scooters makes it difficult to separate the Lime shared e-scooters from their privately owned counterparts and those available through other rental services. There is more opportunity, particularly as the scheme area grows and use increases, to explore the relationship between sharing, renting and owning an e-scooter. It also provides an opportunity to better understand the ways in which a share scheme provides particular use cases, and adds particular barriers, to the use of these vehicles.

■ **Social inclusion** In this analysis, there is some evidence of a potentially exclusionary nature of the requirement for smart phone access the make use of the e-scooters. It is important to explore this further and to better understand the impact of such exclusion and the mechanisms that could make share schemes accessible to more people. Conversely, there are opportunities to understand the ways in which e-scooters could enhance social inclusion, perhaps through providing access to work and education for people who might otherwise have limited transport options, or offering a form of active travel, perhaps in combination with mode chaining, for people who might struggle to walk and cycle for longer distances.

■ **Gender** A further aspect of social inclusion is the potential differential impact of e-scooters on the mobility practices of women and girls. Our analysis indicates a tendency of female respondents to be more likely than males to indicate that concerns about road safety and personal safety may limit their use of e-scooters. They are also less likely to see opportunities to use e-scooters in place of other modes of transport. Meanwhile, there is evidence from other research that the gender balance in e-scooter use may favour women, in contrast to cycling, which tends to be dominated by men. As the research progresses, there is an opportunity to broaden our sample and test the reliability of these statistics and also to explore, qualitatively, the factors that may be influencing the way women and girls perceive and utilise e-scooters.

■ **Vulnerable people** This research highlights a need to understand the ways in which e-scooter use may impact upon pavement users, and particularly those more vulnerable people. This may be a question of a combination of enforcement, training and guidance in order to ensure that e-scooters are not used on pavements. It is also important to anticipate the other points at which e-scooter users and vulnerable pavement users may share space.

Salford Quays

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A Method

Our study comprises a combination of qualitative and quantitative social research methods: online surveys, reference groups and in-depth interviews. This engagement enables an understanding of experiences and perceptions in relation to the e-scooters trial: to identify who is using the e-scooters, why, how, and for what purpose. It allows the trial to be placed within a broader context that takes account of other road users, the wider community, and vulnerable people in particular.

A.1 Approach

The work builds upon the team's previous research on micromobility, including bike share (Sherriff et al 2020) and e-cargo bikes (Blazejewski et al; 2020) and contributes to a growing field on micromobility, sustainable mobility, and active travel.

In particular, the study will create an evidence base on:

■ who is using, or considering using, e-scooters and how these groups could be categorised;

■ reasons for using e-scooters and potential barriers to (further or more extensive) use;

■ journey purposes and other factors influencing the use of e-scooters;

■ the relationship of e-scooting with other modes of transport and how this may encourage inter-modal travel and drive patronage to more sustainable modes;

■ the nature of the e-scooting experience and its relationship with the urban context, including physical infrastructure, traffic and interactions with other road users, pedestrians and cyclists;

■ perceptions of e-scooters by users and non-users in relation to convenience, impact, safety, the public realm and interactions with others;

■ the distribution of the above factors across demographic groups including gender, ethnicity, socio-economic status and levels of vulnerability and the implications of this for uptake and social inclusion;

■ the influence of the Covid-19 pandemic and associated policy responses over use of, and perceptions relating to, e-scooters.

The study runs over 2021 and will report at the end of the e-scooter trial in the autumn. In order to understand the evolution of e-scooter use as the trial develops and expands, it takes an iterative approach that sees the different elements repeated over the year and feed into each other. In the initial stage, documented in this report, the reference groups informed the design of questions used in the online questionnaire, and the questionnaire results enabled the identification of potential interviewees as well as the themes and issues that would be relevant to explore in the interviews.

A.2 Reference Groups

The purpose of the reference groups was to identify key themes relevant to a range of different demographic groups. These themes were used to design the survey questions and inform discussion points for the interviews. The participants were selected to provide a range across gender, ethnicity, and people who had used and not used e-scooters. Questions were posed to the group to guide conversation, but open discussion was encouraged. Each reference group was designed to target different demographics, including community groups, disabled and vulnerable groups, road users, transport planners, mobility researchers, as well as a specific group looking at e-scooters from the perspective of women. The groups provided an opportunity to discuss the e-scooters from a range of viewpoints and experiences.

The 6 reference groups were conducted online, recorded, and lasted approximately 1 hour each. Short summaries of each reference group were created (Appendix D).

A.3 Online Survey

The online survey (detailed in Appendix B) was live from 2nd until 28th March 2021 and was completed by 739 people (the distribution is detailed in Appendix C). It was designed to provide information on the extent of the use of e-scooters, journey purposes, reasons for choosing e-scooters, and the relationship between e-scooter use and other modes of transport. It started with a set of questions intended for those who had used an e-scooter as part of the Salford trial and moved on to questions that sought a more general level of information from users and non-users. These questions, which were informed by the discussion in the reference groups, related to factors likely to limit e-scooter use, personal priorities and factors likely to be important when deciding whether to use an e-scooter, and concerns about the potential impact of e-scooters. We used closed lists to enable people to quickly tell us about their experiences and intentions and facilitate statistical analysis. We ensured that there were opportunities to add 'other' options and to provide free comments, something we felt to be particularly important

in a newly evolving field of mobility in which we have only an initial understanding of factors such as motivations, barriers and journey purposes.

These sections were followed by a comprehensive set of questions to establish demographic characteristics and enabled the team to explore the relationship between these and the use of e-scooters and concerns around them. Using questions on actual use and likelihood of further or additional use in the future, respondents were further divided into Users, Deciders and Avoiders as detailed in Chapter 3.

Rather than restrict the survey to a defined group of people, a volunteer sample was recruited through a diversity of online approaches. Given the novelty and unfamiliarity of e-scooters, such a volunteer sample is appropriate and avoids assumptions that could limit the robustness of the sample (for example, by focusing only on people who already cycle or have already used an e-scooter). The survey was promoted through a range of channels to secure participation of a wide range of people. These included internal news and staff and student communications in different schools at the University of Salford, TfGM's social media platforms, Lime customers registered in Greater Manchester. Twitter and Facebook were used to reach different groups including Salford communities, BBC staff at MediaCityUK, and people involved in walking, cycling and other transport campaigning and policy.

The strategy was therefore to include a range of reasons for a likely connection with e-scooters, whether through interest in transport, direct connection with the University and MediaCityUK sites, or community residents, whilst not focusing on any one of these at the expense of others. The survey was open to all who live, work or study in Greater Manchester but our publicity was focused on Salford. This reflected the practical challenge of recruitment as well as the fact that the scheme is limited to Salford. The focus on the University for this stage of the survey reflects the fact that, for most of the scheme's lifetime to date, the operational area of the share scheme has been limited to the campus.
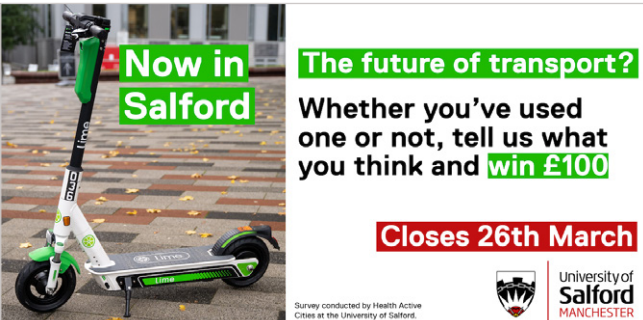
To encourage a large and diverse sample (i.e., not limited to those particularly interested in e-scooters) we offered the opportunity to be entered into a £100 prize draw – this was not compulsory. We wanted to recruit people who had used the e-scooters as well as those who might do in the future or who had no interest in them. An image used on social media (below), our messaging reflected this, emphasising that we are interested in all views and in hearing from people who have and have not used the e-scooters.

To encourage participation in subsequent stages of the research, respondents were asked to indicate if they would be prepared to take part in further online surveys, interviews or reference groups.

A.4 Interviews

The purpose of the interviews was to explore in more depth the themes arising from the survey, sometimes in a generic sense and in some cases in relation to specific themes that survey participants had raised in their responses. The interviewees were selected to provide a range across gender, age and ethnicity and to include people who had and had not used the e-scooters. A diversity of experience was sought, such as to be able to elicit views from people who indicated that they were likely to use e-scooters in the future and who highlighted particular issues or concerns. The free text comments provided in the survey responses were particularly useful for these. Rather than providing a representative sample, then, the interviewees provide an opportunity to explore in more depth the issues likely to aid understanding of experiences and perceptions of e-scooters.

The 11 interviews were conducted by video call or telephone and lasted approximately 30 minutes each. Interviewees have been assigned a pseudonym to maintain their anonymity. Short summaries of each interview were created (Appendix E).

B Online Survey

Q1. I understand what participation entails, how my data will be collected, stored and used, and that my identity will be anonymised in any reports and publications arising from the research. I confirm that I am at least 18 years of age and that I live, work, or study in Greater Manchester.

- Yes
- No

Q2. Before beginning this survey, were you aware that there is a scheme in Salford through which you can hire e-scooters on a per-journey basis?

- Yes
- No

Q3. Have you used an e-scooter as part of the Lime share scheme in Salford?

- Yes
- No

Q4. Have you used an e-scooter that was not part of the Lime hire scheme in Salford?

- No
- Yes, on a privately owned scooter
- Yes, as part of another hire scheme in the UK
- Yes, as part of a hire scheme outside the UK

The following questions were asked to people who had indicated, in Q3, that they had used a scooter in the Salford share scheme.

Q5. If you are able, please say approximately how many times have you used an e-scooter as part of the hire scheme in Salford.

Q6. Approximately how many of these trips would you have made by other means if an e-scooter was not available?

- All
- Some
- None
- Don't know

Q7. Approximately how often have you used an e-scooter as part of the hire scheme in Salford? Select the option that best describes your use.

- Less than once a month
- Once a month
- Once a fortnight
- Once a week
- More than once a week
- Daily
- Don't know

Q8. For which of the following purposes have you used, or would you be likely to use, an e-scooter? (Select all that apply. You do not have to select any).

- Have used
- Would use
- Travelling to a location for work or study
- Travelling as part of work or study (for example, between meetings or lectures)"
- Travelling to healthcare
- Travelling to get a Covid-19 vaccination
- Getting to leisure or entertainment
- Getting to sports or cultural events
- Visiting friends or family
- Shopping
- Riding simply for fun or recreation
- Curiosity (trying out an e-scooter)

Q9. Have you used, or would you be likely to use, an e-scooter in any of the following places? (Select all that apply. You do not have to select any).

- Have used
- Would use
- University of Salford Peel Park campus
- University of Salford Frederick Road campus
- MediaCityUK
- Between MediaCityUK and the Peel Park campus
- Elsewhere in Salford

Q10. When using an e-scooter in Salford have you used it, or would you be likely to use it... (Select all that apply. You do not have to select any).

- Have used
- Would use
- ...on the pavement
- ...on the road
- ...on pavement areas of campus
- ...in cycle lanes on the road
- ...other

Q11. When using an e-scooter in the Salford shared scheme, have you worn a helmet?

- Yes
- No
- Sometimes

Q12. When making a journey using an e-scooter, which of the following types of trips have you replaced, or would you be likely to replace? i.e. used an e-scooter instead of another option (Select all that apply. You do not have to select any).

- Have used
- Would use
- Walking
- Cycling
- Bus
- Train
- Tram (including Metrolink)
- Private Car
- Taxi or Uber
- Other form of transport

Q13. When making a journey using an e-scooter, what types of transport have you used or would you be likely to use as part of the same journeys? For example, using an e-scooter to get to a train station. (Select all that apply. You do not have to select any).

- Have used
- Would use
- Walking
- Cycling
- Bus
- Train
- Tram (including Metrolink)
- Private Car
- Taxi or Uber
- Other form of transport

Q14. Thinking about when you have used an e-scooter as part of the Lime share scheme, how would you rate the following aspects?

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very satisfied
- Finding out about the service
- Registering for the service through the App
- Finding an e-scooter to use
- Unlocking the e-scooter ready to use
- Information on how to ride the scooter
- Returning and locking the e-scooter
- Comfort when riding the e-scooter
- The cost per journey

Q15. For which of the following reasons would you choose to use an e-scooter? (Select all that apply. You do not have to select any).

- Curiosity
- Shorter journey time (than other options)
- Convenience
- As a mobility aid
- Cheaper (than other options)
- To be able to socially distance
- When no other transport available for the route
- Other

Q16. Are you aware that Lime has a concessionary scheme for key workers and individuals on low income? (These are called Lime Aid and Lime Access respectively).

- Yes
- No

Q16_a. If yes, have you taken advantage of either of these schemes? (Please tick any that apply).

- Lime Aid (for key workers)
- Lime Access (for individuals on low income)
- Neither

Q17. How likely would you be to use an e-scooter again?

- Very unlikely
- Somewhat unlikely
- Somewhat likely
- Very likely
- Undecided

The following questions were asked to people who had indicated, in Q3, that they had not used an e-scooter in the share scheme.

Q18. If e-scooters were available in your area through a hire scheme, how likely would you be to use one?

- Very unlikely
- Somewhat unlikely
- Somewhat likely
- Very likely
- Undecided

Q19. For which of the following purposes would you be likely to use an e-scooter? (Select all that apply. You do not have to select any).

- Travelling to a location for work or study
- Travelling as part of work or study (for example, between meetings or lectures)
- Travelling to healthcare
- Travelling to get a Covid-19 vaccination
- Getting to leisure or entertainment locations
- Visiting friends or family
- Shopping
- Riding simply for fun or recreation
- Curiosity (trying out an e-scooter)
- Other

Q20. Would you be likely to use an e-scooter in any of the following places? (Select all that apply. You do not have to select any).

- University of Salford Peel Park campus
- University of Salford Federick Road campus
- MediaCityUK
- Between MediaCityUK and the Peel Park campus
- Elsewhere in Salford

Q21. If using an e-scooter in Salford would you be likely to use it... (Select all that apply. You do not have to select any).

- ... on the pavement
- ... on pavement areas of campus
- ... on the road
- ... in cycle lanes on the road
- Other

Q22. When making a journey using an e-scooter, which of the following types of trips would you be likely to replace? i.e., use an e-scooter instead of another option (Select all that apply. You do not have to select any).

- Walking
- Cycling
- Bus
- Train
- Tram (including Metrolink)
- Private Car
- Taxi or Uber
- Other

Q23. When making a journey using an e-scooter, what types of transport have you used or would you be likely to use as part of the same journeys? For example, using an e-scooter to get to a train station. (Select all that apply. You do not have to select any).

- Walking
- Cycling

- Bus
- Train
- Tram (including Metrolink)
- Private Car
- Other form of transport
- Taxi or Uber

Q24. What would be your reasons for choosing to use an e-scooter? (Select all that apply. You do not have to select any).

- Curiosity
- Shorter journey time (than other options)
- Convenience
- As a mobility aid
- Cheaper (than other options)
- To be able to socially distance
- When no other transport available for the route
- Other

The following questions were asked to all respondents.

Q25. How likely are each of the following to limit how much you use e-scooters?

- Very unlikely
- Unlikely
- Neutral
- Likely
- Very likely

- Concern about road safety (threat from vehicles)
- Concern about crime and anti-social behaviour
- Not knowing which routes to take
- Not knowing how to use an e-scooter
- Not having a helmet available
- My disability or mobility impairment
- The cost of scooter use
- Having to have a provisional driving licence

Q26a. How important are each of the following factors to you when deciding whether to use an e-scooter?

- 1 - not at all important
- 2
- 3 - somewhat important
- 4
- 5 - very important
- Undecided

- Being able to hire a helmet at the same time as an e-scooter
- Knowing there is training available on using an e-scooter
- Knowing there is training available on how ride in traffic
- Being able to ride on separated lanes for e-scooters
- Knowing that e-scooters are cleaned in a Covid-safe manner
- Being able to leave the e-scooter anywhere in the city after the journey
- Knowing exactly where you can find an e-scooter

Q27. For each of the following, how concerned are you about the potential impact of e-scooters in your area?

- Not at all concerned
- Not concerned
- Neutral
- Somewhat Concerned
- Very concerned
- Taking up space in public areas
- Making pavements unsafe
- Being vandalised
- Being ridden irresponsibly
- Slowing down other vehicles on the road

Q28. Do you have any additional comments about e-scooters and how you might make use of them?

Q29. Please provide the first half of your home postcode (e.g. M21).

Q30. Do you live, work or study in Salford? (Select any that apply). Since the e-scooter share scheme is initially focused on Salford, starting with the University.

- Live
- Work
- Study
- None of the above

Q30_a. Do you work or study at the University of Salford, including SALFOOD? (Select any that apply).

- Yes - Work
- Yes - Study
- No

Q30_b. Which of the following best describes your employment at the University of Salford or SALFOOD? (If you have multiple roles, please select the main one).

- Academic
- Academic Related
- Assistant Staff
- Manual & Ancillary
- SALFOOD
- Other

Q30_c. Which of the following best describes your course at Salford? (If more than one, please select the main one).

- Undergraduate
- Postgraduate
- Doctoral
- Other

Q30_d. In which area of the University are you mainly based?

- Frederick Road
- Peel Park
- MediaCityUK
- Other

Q30_e. Do you live in University of Salford Peel Park campus accommodation?

- Yes
- No

Q31. Which of the following best describes your gender?

- Male
- Female
- Prefer to self-describe
- Prefer not to say

Q32. How old are you?

- 18-25
- 26-35
- 36-45
- 46-55
- 56-64
- 65-74
- 75 or over

Q34. Please choose one option that best describes your ethnic group or background.

- White
- Black / African / Caribbean / Black British
- Asian / Asian British
- Mixed / Multiple Ethnic Groups
- Not listed / Prefer to self-describe
- Prefer not to say

Q35. From those in this list what is the highest level of qualification you have?

- GCSE or equivalent
- A levels, AS level or equivalent
- NVQ or equivalent
- Undergraduate degree or equivalent
- Postgraduate degree or equivalent
- PhD or equivalent
- None of the above

Q36. What is your best estimate of your total household income before tax?

- Up to £10,000
- £10,000 - £19,999
- £20,000 - £29,999
- £30,000 - £39,999
- £40,000 - £49,999
- £50,000 - £59,999
- £60,000 or more

Q37. Do you have a long-term illness, health problem or impairment that limits daily activities?

- Yes
- No

Q38. Thinking about how you get around during times when there are no Covid-19 restrictions and you are attending work, study and/or social activities as usual, which of the following do you use as part of your regular activities? (Please tick any that apply.)

- Walking (as a main part of a journey)
- Cycling
- E-scooter (hire scheme)
- E-scooter (privately owned)
- Car as driver
- Car as passenger
- Taxi or Uber
- Train
- Tram (including Metrolink)
- Bus
- Motorbike
- Other

Q39. Do you personally own or have continuous use of a cycle, or a car, van or motorbike? (Please tick any that apply).

- Bicycle or other cycle
- Car, van, or motorbike

Q40. As part of this study we will be conducted further surveys, interviews and focus groups. May we contact you to invite you to take part in future stages?

- Online survey(s)
- Interviews
- Focus groups

Q41. People who live, work or study in Greater Manchester are eligible to be entered into a free prize draw to win £100 in shopping vouchers. Would you like to be entered?
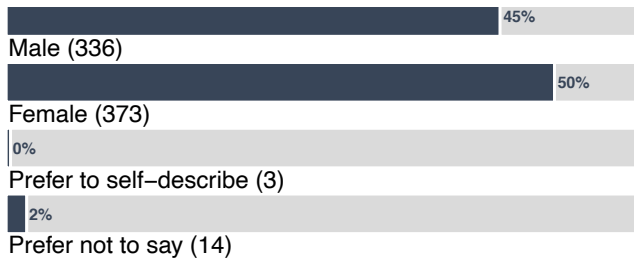
- Yes
- No

Q42. If you selected yes to any of the above, please provide your email address so we may contact you. We will only use this information to contact you about the research or the prize draw.
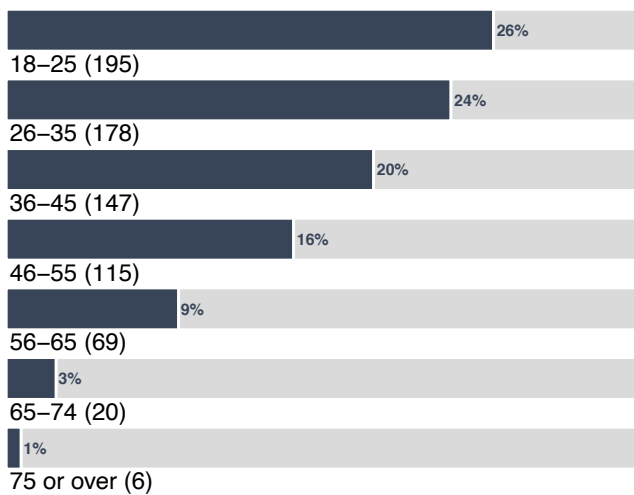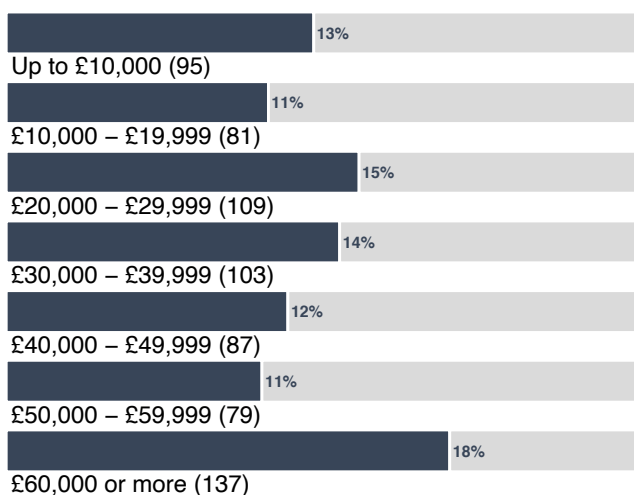
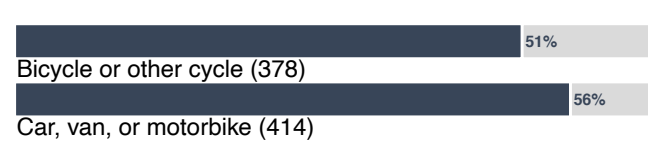# C Survey Respondents

Gender (Q31)

45%	Male (336)
50%	Female (373)
0%	Prefer to self–describe (3)
2%	Prefer not to say (14)

Age (Q32)

26%	18–25 (195)
24%	26–35 (178)
20%	36–45 (147)
16%	46–55 (115)
9%	56–65 (69)
3%	65–74 (20)
1%	75 or over (6)

Household Income (Q36)

13%	Up to £10,000 (95)
11%	£10,000 – £19,999 (81)
15%	£20,000 – £29,999 (109)
14%	£30,000 – £39,999 (103)
12%	£40,000 – £49,999 (87)
11%	£50,000 – £59,999 (79)
18%	£60,000 or more (137)

Long-term illness, health problem or impairment (Q37)

10%	Yes (74)
87%	No (646)

Access to cycle, car, van or motorbike (Q39)

51%	Bicycle or other cycle (378)
56%	Car, van, or motorbike (414)

Use of transport (Q38)

78%	Walking (main part of a journey) (580)
40%	Cycling (300)
6%	E–scooter (hire scheme) (48)
3%	E–scooter (privately owned) (22)
48%	Car as driver (352)
24%	Car as passenger (181)
26%	Taxi or Uber (196)
33%	Train (247)
38%	Tram (including Metrolink) (281)
39%	Bus (287)
1%	Motorbike (8)
1%	Other (7)

Live, Work or Study in Salford (Q30)

36%	Live (268)
34%	Work (254)
25%	Study (186)
29%	None of the above (216)
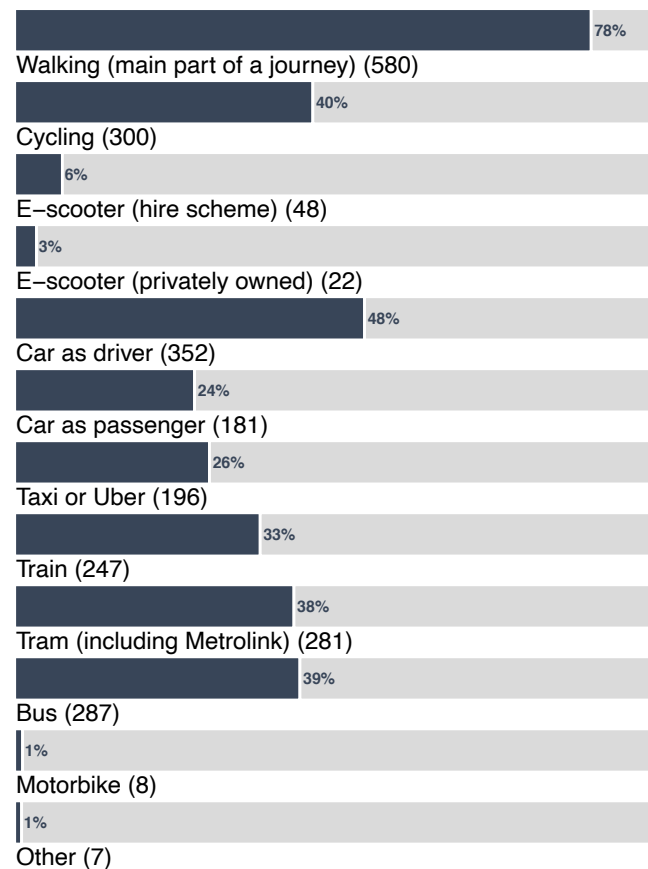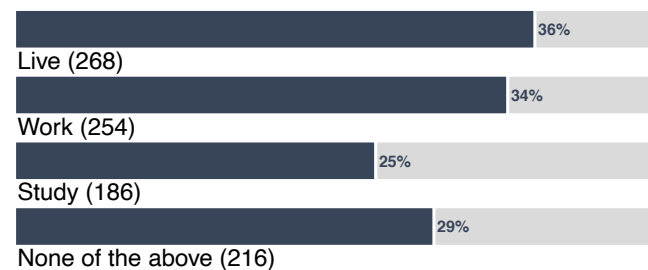
Work or Study at University of Salford (Q30A)

10%	Yes – Work (77)
22%	Yes – Study (164)
22%	No (164)
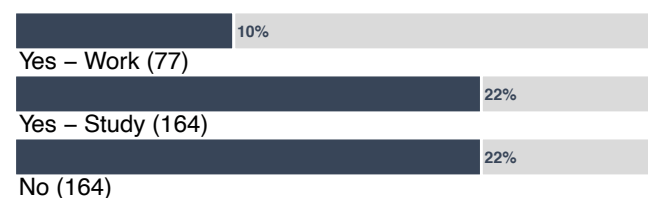
D Reference Groups

Online discussions were held with a set of reference groups formed to reflect specific expertise and experience relevant to understand e-scooters and their use in Salford. The membership of the reference groups are drawn from Mobility Researchers, Transport Planners, Community Organisations, All Road Users, Women, and Disabled People and Vulnerable Users. In this section we provide summaries of the discussions. These reflect the views and perceptions of the participants.

D.1 Mobility Researchers

This group comprises researchers in the field of mobility and micromobility, based in the UK, Germany and Spain. Its purpose is to place the Salford e-scooter trial within the context of sustainability and active travel and therefore contribute to the development of the methodology and the refinement of the research focus.

For this first meeting, the focus was on participant experiences of e-scooters and reflecting on the current evidence base. The participants had varying levels of experience of e-scooters, and mobility research, in different settings. A discussion of these experiences led to the identification of a set of considerations for the field and for this research project as it develops.

E-scooters as part of the wider transport landscape

E-scooters can be understood in the context of the overall transport provision and public realm in cities. One participant had experience of using dockless e-scooters in Germany for routes where public transport was not sufficient. During time spent in Copenhagen, the density and design of the city, as well as the prominence of cycles on the city's roads and culture, meant that cycling continued to be the most practical means for many journeys. Another participant had experience of sharing the cycle infrastructure with e-scooters in Spain and had seen the challenges that can arise from this combination, noting that the city of Barcelona had hurriedly put in place regulations to shape e-scooter use. In another city, visited by a participant on holiday, there were many different e-scooter options and they seemed to be popular. One of the challenges was the sharing of space in pedestrian zones.

There seems to be a close relationship with cycling, as e-scooters are perceived to account for similar use cases and share the same spaces. Whilst the ways in which e-scooters play out in cities may therefore be strongly determined by the extent of cycling infrastructure and a

culture of cycle use, it is important to bear in mind that e-scooters may attract a different user base and be used for different journey types.

E-scooters as disruption

Viewing transport systems as dynamic, e-scooters can be seen as a disruption and one that could change the way space is allocated and used, as well as the modal choices that individuals make.

The dockless sharing element of e-scooters means that, alongside dockless bikes, they are an opportunity for meeting the 'last mile' and therefore to be combined with other modes of transport. Their privately-owned counterparts may also be valuable for the last mile, since they can be carried relatively easily on public transport.

E-scooters are currently novel, particularly in the UK, and use may be driven by a certain level of curiosity and playfulness. This aspect need not be downplayed and pitted against 'serious' transport, as it may be a reason people are drawn to them: there is no reason that journeys from A to B should not be enjoyable. This is an interesting context in which to view the social gatherings of young people on e-scooters that have been observed in Salford.

Placing e-scooters in the context of Salford

The Salford context is interesting in that it is not a tourism centre, but the large numbers of visitors to the Imperial War Museum North, the Lowry Centre and MediaCityUK, could provide a use case.

Thinking about the disruptive nature and the potential use cases, we need to better understand what gap e-scooters are potentially filling. This will aid understanding of how they can be integrated into everyday life and mobility practices, and how cities and transport systems can better accommodate them.

Users and Use Cases

As a research and policy community, we are still establishing who are the main users of e-scooters and what the primary purpose of use is, and the current research will contribute to the evidence base on this. The ways in which e-scooters are presented is a factor, and the researchers noted that the images presented in advertising are commonly around relatively young males, and professional people. This idea of the 'imagined user' was touched upon and it was felt that more work is needed to unpack this in the context of e-scooters.

Research is starting to show that in some cities, the gender balance for e-scooter use is weighted towards female users, particularly in younger age groups. In the case of cycling, the situation is generally opposite, and males tend to dominate. There is an opportunity to explore why this might be the case and to understand if there are particular aspects of e-scooter use that make it more attractive and/or practical for female users – it could for example reflect price, riding style, road safety or personal safety. The 'mobility of care' concept, however, whereby it is argued that female mobility needs or tends to reflect their larger share of caring responsibilities and is more likely to involve carrying shopping and/or children, would imply that e-scooters are not practical for some of the use cases that are more likely to be, but not exclusively, relevant to women.

The COVID-19 context is important: as we return to pre-lockdown levels of mobility there is a likelihood that individual modes, as opposed to public transport, will become more important out of concern for virus spread in confined spaces. E-scooters may therefore offer an alternative to the private car for some journeys.

Conceptualising E-scooters

At a conceptual level, and one with direct relevance to how policy is developed and communicated, it is important to consider where e-scooters fit within active travel – are they both part of and apart from walking and cycling? In a sense, they are outsiders in this sphere, but in another way they are a continuation of the proliferation of micromobility modes that is becoming increasingly visible in our cities. In relation to the health implications, what evidence is there on the health benefits of e-scooters in relation to walking and cycling and what opportunities are there to measure health impacts? How will this shape the ways in which active travel organisations see e-scooters?

In envisaging the UK e-scooter trial and planning this piece of research, it is important to consider what success looks like. This will likely involve demonstrating modal shift and allaying some of the fears about safety. A valuable outcome would also be establishing a role for e-scooters within the transport system and a better understanding of the users and use cases and therefore an ability to more effectively plan for them.

D.2 Transport Planners

This group comprises transport planners in the fields of active and shared mobility based in Manchester and Salford. The purpose of this reference group is to discuss the role of e-scooters as an alternative form of sustainable transport, as well as identifying any emerging trends from the trial scheme so far. For this first meeting, the focus was on discussing decisions around the implementation and roll-out of the e-scooters. Most participants had some level of involvement in the development of the scheme.

Reviewing the trial scheme so far

- E-scooters require 2-3 rides before the user adjusts to the speed at which the e-scooters can travel. Several focus group participants highlighted that 15mph feels very fast when you are standing up on an e-scooter.

- Initial data on the number of trips since launch (Oct 2020) until March 2021 suggests the e-scooters are being well used, even with lockdown and the limited geofence between Salford University campus and MediaCityUK.

- A lot of students are reportedly using them for short journeys, and the majority of users are sticking to the rules, such as staying in the geofence and parking the e-scooters within the correct boundaries. These are positive signs for transport planners looking to expand the scheme across Salford.

What does success look like?

- One key ambition is to use the e-scooters to enhance connectivity between areas in Salford and bridge disparities between socio-economic areas, encouraging inclusivity and equitable transport.

- The success of the scheme hinges on numerous factors, including day to day usage, evidencing a broad range of age groups using the e-scooters, and there being a low number of collisions, especially as the geofence grows. The participants are also very interested in evidencing a noticeable shift from car use.

- Another marker for success would be for other districts to have confidence in the e-scooters based on the findings of this trial.

- Changing perceptions is also important – e-scooters are not always considered to be a legitimate mode of transport. If the trial can begin to change this perception that would be a significant marker of success.

- Could e-scooters be adopted by businesses in the city, and rather than having a pool of bikes they could have e-scooters?

- It is anticipated that the e-scooters will mostly be used by younger people, but as the e-scooters become more mainstream and embedded, the group are curious to see how much buy-in there is from older people later.

- What are the developed personas for e-scooters? Many people think they will be young, male professionals. Can the trial scheme prove this wrong and remove the assumption of there being an imagined user?

Overcoming Challenges

One of the challenges has been convincing decision-makers that the Salford e-scooter scheme will not be exposed to some of the problems suffered by the 2018 Mobike bike share scheme, particularly theft and vandalism. The experience with Mobike has cast a long shadow over public hire schemes. Greater Manchester police have been involved in the rollout of the e-scooter scheme from the initial stages and are keeping an eye on the situation and developing strategies to respond if needed.

One of the challenges early on in the scheme, and the planning process, was the identification of an e-scooter operator who could operate under Department for Transport rules and had experience of rolling out similar schemes.

It will be important to monitor any anti-social behaviour relating to the scheme and the areas it covers – for example, the current route connecting Salford University campus with MediaCityUK includes several subway underpasses under a large, busy road junction.

E-scooters are a form of transport that lend themselves to social distancing and evidence is suggesting that the risk of catching the virus from surfaces is low, making the vehicles a fairly safe proposition. Part of the tender scheme asked operators to evidence how they could ensure COVID-safe practices.

D.3 Community Organisations

This reference group comprises members of community engagement groups in Salford who deal primarily with vulnerable and older residents. The purpose of this reference group is to discuss the potential impacts of e-scooters on vulnerable people, as well as the potential of the e-scooters to be of value to people with mobility challenges. For the first meeting, the focus was on the barriers and safety concerns around the scheme, as well as how vulnerable people might interact with the e-scooters as the scheme starts to expand.

Concerns about safety

None of the participants had used an e-scooter in Salford, or anywhere else, but most said they would consider using them in segregated cycling lanes. There was generally a widespread concern about the role of e-scooters in creating additional barriers for vulnerable people when navigating shared spaces or the pavement.

- One participant expressed a concern about reaction times amongst older people, identifying the quiet sound of an e-scooter motor as a potential threat.

- People with hearing challenges might not be able to hear the e-scooters coming, and therefore might not be able to react fast enough to get out of the way when sharing space with these vehicles.

- These challenges may be compounded by a lack of awareness around the scheme – and a lack of support for older people on how to share these spaces.

- A participant identified Langworthy Road (amongst other roads in Salford) as a busy road where the pavement leads up to people's front doors. This means as soon as residents open their doors they are on the pavement, and this could cause potential conflicts if e-scooter users suddenly start appearing on the pavement.

Interacting with the e-scooters

One participant runs a community group that meets in Peel Park for a social walk. This is one of the sites where the e-scooters are currently available and being used in Salford, however, she was not intimidated by the e-scooters and said that their use will not influence her decision to continue running this group after lockdown.

There was evidence of a level of scepticism in the group about the e-scooters as a long-term legitimate form of transport, and they struggled to envision how the e-scooters could work for them on a daily basis. However, one participant did also recognise that these kinds of schemes require time to settle into a community, as behaviour change can take a long time to occur – and identified vulnerable people to usually be the last people to change their behaviour, as a result of their additional needs.

One participant felt that the target audience of an e-scooter is very similar to the target audience of a mobility e-scooter, therefore, there is potential for e-scooters to offer a form of transport to older and vulnerable groups. However, if they already own a mobility scooter, the e-scooter may not offer anything new – mobility scooters also usually have luggage capacity for shopping, making them more practical.

D.4 All Road Users

This group comprises different types of road users in Salford, including people who cycle, drive, walk, and those who have some experience of using an e-scooter. The purpose of this focus group is to discuss thoughts about sharing space with e-scooters, and how they might perceive using an e-scooter alongside other forms of transport. For this first meeting, the discussion focused on their experiences of seeing or using e-scooters in the UK or abroad, and how they might anticipate using the trial scheme in Salford.

Identifying the potential of e-scooters

One participant had tried the e-scooter trial in Salford and enjoyed their experience. She thought they could provide a new form of inter-campus transport, which could complement or replace the free university bus service – and suggested that if the university had a staff account with the e-scooter operator, more members of staff would consider using them to travel between meetings or between campuses.

The group generally agreed that they can see the e-scooters becoming more useful to them as the geofence expands and more e-scooters become accessible. Concerns began to be expressed, however, about pavement clutter and the potential challenges around using e-scooters in shared spaces as the scheme grows.

Barriers to use and concerns about safety

Multiple participants expressed concerns about using the e-scooters on the road in Salford, and one participant went further by voicing his concerns about any route choices available on the e-scooter trial that shares space with pedestrians.

The idea of shared space and the top speed of the e-scooters was identified as a potentially dangerous combination – however, the group believed this would be overcome eventually once pedestrians and e-scooters have had time to adapt to each other. Accountability of users was also raised as an issue, with the group questioning how irresponsible e-scooter use can be reported if experienced. The process for reporting irresponsible e-scooter use should be made clear to road users.

One participant saw environmental concerns to be at the bottom of her list of priorities when it comes to reasons for using the e-scooters. She identified congestion and time saving as much higher priorities when considering transport options.

Bike theft and safety in Salford was also raised as a concern when using the e-scooters, with one participant revealing that she has two bikes as an adaptation strategy: one 'cheap' bike and one expensive bike, but only uses the cheap bike when she is cycling into town as she is concerned about theft.

Different perspectives on geofenced parking

There was an interesting discussion about the role of the geofence, with two very different perspectives shared by participants. One participant suggested that he thinks limited geofence parking makes it harder to use the e-scooters more freely because of the geographical limitations imposed when parking an e-scooter. However, another participant did not see this as a barrier, but as a positive thing, arguing that it was an encouragement to use the e-scooters responsibly so they do not clutter up pavements and cause issues for vulnerable people on the pavement – linking this to reflections on the impact of the 2018 Mobike scheme on public space.

D.5 Women

This group comprised of four women (three employed and one retired), three of whom lived in Salford and one who worked in Salford. The aim of the reference group was to understand barriers specific to women and opportunities to address these in the e-scooter trials and regulation changes around the use of private e-scooters.

Whilst only one of the four women had used an e-scooter (and not as part of the Salford trial), all four women had observed e-scooters – mainly private e-scooters – being used within Greater Manchester. During the reference group, the women discussed perceptions and experiences of e-scooters from their experiences of sharing space and as potential future users. All the women within the group expressed interest in trying out e-scooters in the future.

Within the group two women regularly cycled whilst one woman had cycled prior to moving to the UK but found cycling infrastructure was too poor and the weather unpleasant to cycle in. The women who do not cycle used walking, the bus and occasionally Uber as their main forms of transportation.

Experiences of e-scooters: interactions

All members of the group had observed private e-scooter use around Greater Manchester, noted that they were commonly being ridden by younger men (although more recently they had seen a growing number of younger women riding them), and all agreed that the e-scooters looked fun to use.

From encounters with e-scooters in other cities across Europe, as well as with Mobike in Greater Manchester, the group expressed concerns about the storage of e-scooters (whether in designated bays or just left by users) on pavements and the particular challenges these practices pose to blind and visually impaired people.

The group discussed e-scooter use that they have seen so far in Greater Manchester and considered behaviour to be respectful of pedestrians and speculated that this was because, as private e-scooters are currently illegal, users are more likely to be careful when using them to avoid being noticed by the police and having them confiscated. The group discussed experiences of walking in other European cities with high e-scooter use, and that this impacted negatively on the pedestrian experience, with e-scooter users (potentially also tourists) weaving quickly between pedestrians.

Barriers to e-scooter use

The barrier to e-scooter use deemed as most significant within the reference group was the lack of suitable infrastructure – if cycling infrastructure is taken as the most suitable infrastructure for e-scooter use – across Greater Manchester. The group reflected that this was particularly relevant for women – as happens with cycling, when infrastructure is insufficient, it is younger, more confident men who are more likely to cycle. Participants had observed the same pattern in private e-scooter use currently.

The second barrier to e-scooter use was understanding the systems around e-scooter use, such as how to use the app and get the scheme working, the rules around e-scooter use and where e-scooters can and cannot go, and how geofencing works. These concerns were voiced by group participants who currently did not cycle, whilst those who did cycle seemed more confident about the practicalities and rules around e-scooter use.

A third barrier identified within the group were potential cultural and gendered concerns around using e-scooters. Participants considered that e-scooters increase the visibility of the rider on the street, similarly and perhaps more so than cycling. Women felt this could make them more of a target for harassment such as catcalling.

A fourth barrier to use identified within the group was the current limited area of the scheme. The corridor was not perceived as particularly useful for many of the group, particularly considering that those involved in teaching at the University of Salford are currently working from home. This meant that the journeys that members of the group expressed interest in trying out e-scooters for could not be undertaken within the trial area.

A final barrier was how e-scooter use could be prevented by personal illnesses, disability and use of medication. People who are uncertain whether they will be able to use an e-scooter might then struggle to just get on an e-scooter and use it but would need space to practice before taking it on to the streets.

Opportunities for e-scooter use

Within the group, women considered that e-scooters would be most suitable for shorter journeys, such as between the University of Salford's Allerton and Maxwell buildings.

The group discussed longer journeys on the e-scooters and decided that e-scooters could present an opportunity in getting to places that perhaps were not on bus routes or were more convenient than the bus, or on a bus route on which their bus pass was not valid. The relevance of e-scooters for these journeys was only valid if the cost of e-scooter use would be lower than the cost of getting the bus.

The group also discussed the potential use of e-scooters at night by women. The group reflected that after Sarah Everard's murder there was some discussion on Twitter by women who felt safer cycling than walking, particularly at night. The participants noted that e-scooters could potentially serve a similar purpose and combine with public transport to enable women to travel through areas more safely, as well as not necessarily have to wait for buses and taxis.

D.6 Disabled People and Vulnerable Users

The disabled people and vulnerable users reference group was attended by six individuals working across the Greater Manchester region on issues of accessibility and inclusion for disabled people both within the build environment, as well as transport and physical activity more broadly. Participants in the group represented several different organisations relevant to Salford, including the Royal National Institute for Blind People North West (RNIB NW), EmpowerYou, Salford Autism, Disabled People Against Cuts (DPAC) and Salford Disability Forum.

Within the group significant frustration was expressed that e-scooters are being introduced in a way that is targeting young and non-disabled people and this was felt to be another example of the needs of disabled people being side-lined within transport initiatives. Members of the group also expressed concern that the current trials are being undertaken during lockdown and when many vulnerable people are shielding and so less likely to be out and experiencing e-scooter trial schemes, or the perceived rise in private e-scooter use, meaning that many disabled people may not realise the issue and impact of changes in e-scooter legislation.

Experiences of e-scooters: use

Experience of e-scooter use within the group was limited to one member. This member reflected that in terms of use, whilst the e-scooters are relatively easy to operate, the processes around the app, scanning the barcode and needing to have a smart phone in order to rent an e-scooter should be considered in terms of accessibility.

Concerns over use on pavements

The greatest challenge that e-scooters pose to many disabled people and particularly blind, visually impaired, and deaf/hard of hearing people was the use of e-scooters on pavements. All members of the group had experienced private e-scooter use on pavements and had participated in discussions on the challenges that e-scooters on pavements pose to disabled people within their communities. A number of challenges related to e-scooter use on pavements were identified, including:

- Pavements are already an overburdened space, becoming narrower and more cluttered as roads are widened, cars are parked on pavements, and people cycle on pavements because they perceive roads to be not safe enough. Introducing e-scooters under the same conditions will result in taking more space away from pedestrians.

- As e-scooters are quiet, if they come up behind deaf or hard of hearing, blind or visually impaired people it can be quick shocking and the pavement can become a hostile area rather than a safe pedestrian haven.

- The impact of an e-scooter coming up behind an autistic person was also perceived as a potential problem. Also, people with mobility impairments and wheelchair users struggle to take the evasive actions necessary if e-scooters are moving at speed.

- Whilst the level of reported incidents on pavements with e-scooters are currently very low, the group believed the actual number of incidents was a lot higher. This is because if an e-scooter user crashes into you they can just scoot away, and it is very difficult to report them.

- Concerns over the e-scooters being stored on the pavements or being left on the pavements by users if there is not a dedicated place to store them and becoming a trip hazard for people with visual impairments and an obstruction to people with mobility impairments and using mobility aids.

E-Scooters as mobility aids

Prompted by the facilitator, the group discussed the potential of e-scooters as mobility aids. Whilst the ability to use e-scooters as mobility aids would vary between disabled people, the group reflected upon a few different circumstances where e-scooters could provide this opportunity.

- The first was for people with early onset fatigue, who could use e-scooters as it would take away their need to use their body as intensely. They could use e-scooters for short journeys that they would normally walk.

- Another example was that for people with autism, e-scooters could provide an opportunity to avoid busy areas that may feel overwhelming.

- Because e-scooters are potentially collapsible and quite portable they could offer real opportunities to make multi-modal travel accessible for people with mobility issues by enabling them to connect e-scooter use with public transport networks. However, if e-scooters can be taken on buses, with buses in their already limited format for people using wheelchairs and with guide dogs, there is the risk that they take up the space that is designated for those people.

Recommendations

- The group unanimously agreed that e-scooters need extensive segregated infrastructure (like cycles) in order to prevent pedestrian–e-scooter conflict on pavements and in pedestrian areas.

- From their personal and community experiences within the group there was limited confidence that the average person could be trusted to use an e-scooter responsibly and the group agreed there needed to be more training for e-scooter users regarding vulnerable pedestrians and that e-scooter users needed a safe space to initially practice using an e-scooter.

- The group also considered a better process for reporting e-scooter incidents to be necessary and that there needs to be more obvious identification of e-scooter users within rental schemes, and potentially more generally if private e-scooters are legalised.

- The group were glad that a provisional licence was needed as part of the trial and moving forwards felt that users should have a provisional or a full UK driving licence.

E Interviews

One-to-one online interviews were conducted using video conferencing software. Except where indicated with quotation marks, the following are paraphrased versions of the views of the interviewees. Interviewees have been assigned a pseudonym to maintain their anonymity. In this section we provide summaries of the discussions. These reflect the views and perceptions of the participants.

This cohort of interviewees includes six women and five men. They fall into the following age groups: 26-35 (x3), 36-45 (x4), 56-65 (x3), 65-74 (x1). Five interviewees had experience using an e-scooter within the Salford trial and six had not used an e-scooter in any setting.

E.1 Jessica

Jessica mainly walks, uses a push scooter or takes the bus. She thinks e-scooters could help with public transport capacity issues and social distancing during COVID-19. She has not used an e-scooter in the trial because it does not cover her area and she does not have a provisional driving licence.

Jessica mainly gets around by bus or walking - bus is her main mode of transport. She also has a push scooter but doesn't use it so much as she finds it difficult to both fold up and lock. She has a long-term condition with her shoulders that prevents her from using a traditional bike (also she doesn't have bike storage options in her flat). She would consider a fold-up bike, but they are currently too expensive. She can use her push scooter to go to her dance class or the library, where she can bring the scooter inside. When shopping she has to use a lock to secure the scooter, however smaller wheels on the scooter make locking harder.

She cannot fold the scooter as the self-tightening screws on her scooter are very stiff - they shouldn't require a tool, but she has found it very difficult to manage herself. This is annoying to her because she had thought it would be a perfect option to save on bus fare. She is on low income and working on temporary contracts - she has changed jobs 3 times during the last year. Buses are very expensive, and cost would be the main driver in finding an alternative mode of transport.

During COVID-19 she has found buses awkward and occasionally "quite scary" - particularly between 8-9am when they are very busy and social distancing is not being adhered to by passengers or enforced by drivers (policed well by Stagecoach staff in Manchester centre, but not in Stockport). She sees lots of people walking rather than taking buses because of this issue - she herself has done a one hour walk to work to avoid a crowded bus. Crowding on buses is largely due to school children

taking the bus at these times, which she feels should have been factored into bus planning. She thinks e-scooters could be very useful for teenagers getting to school and would mean parents not having to drop off at school and therefore potentially fewer cars on the roads.

Jessica hasn't engaged with the Salford e-scooter trial, partly as it's not in the area where she lives or works, but mainly because she doesn't have a provisional driving licence or a smart phone. She did consider buying an e-scooter when she bought her push scooter - lack of exercise (relative to a push scooter) and cost were the main reasons she didn't go for one. She would however consider using and/or buying one in the future.

She feels scooters do not have the same maintenance cost as a bike and also do not require as much gear. She doesn't feel she'd need high visibility clothing and other gear for a push scooter but does think she'd need it for an e-scooter (because e-scooters could be used on roads rather than pavements). She has found it harder to use scooters on pavements during COVID-19 as it's harder to maintain social distancing (compared to as a pedestrian, when it's easier to react). She doesn't agree with the current requirement to have a provisional driving licence to use e-scooters - feels it should be something a notch above the current cycle proficiency training and that the current legal status of e-scooters (i.e. not allowed in public spaces and outside of official trials) is the main barrier to their general take-up.

She thinks that in a wider rollout than the current pilot in Salford, e-scooters might face similar issues to Mobike, with e-scooters being dumped and trashed. Overall, travel options should be cheap, easy to use, reliable, and not complicated and she sees no reason why scooters/e-scooters cannot be part of the wider transport picture.

E.2 Sophie

Sophie mainly used public transport and would like to use her bike more. She has used the e-scooters between Peel Park Campus and MediaCityUK and had a few technical difficulties along the way but found the route acceptable. In the future, she's more focused on using her bike more than e-scooters.

Sophie works for a local authority. She recently moved to Greater Manchester (Dec 2020) for work, after previously living in London. She mainly uses public transport, but also has a bike, which she would like to use more. Her commute is 7 miles - she doesn't feel fit enough to take on the full commute by bike but would like to complement public transport with other options (potentially including e-scooters). She finds Greater Manchester public transport limited - in particular buses are infrequent and very expensive. She has used e-scooters twice in Salford and once previously in San Jose (California, US).

The reason for her first (and main) use in this trial was as a means of exploring and familiarising herself with Salford – she cycled with her partner to University of Salford Peel Park Campus, picked up an e-scooter and journeyed to MediaCityUK. It was a sunny Saturday, alongside mostly teenagers on their phones, searching for e-scooters (found it "a bit like Pokémon Go"). She struggled to find safe bike parking options on Peel Park Campus that weren't exclusive to staff/students. Also, when searching for e-scooters, she found there were several e-scooters on the pavement that weren't showing as available on the app (and therefore couldn't be used).

They had a mixed experience on the e-scooters - found the route was fine (e.g. decent surface, wide pavements, felt safe) but the e-scooter cut out several times on the route, hitting several red zones even though they followed the route exactly (needing to push the e-scooter, lift onto kerbs etc, which was heavy and a hassle). They also found the app cut out several times, needing to be rebooted. They kept to pavements and segregated cycle lanes – she wasn't sure whether they could go on roads - this hadn't been made clear before use (doesn't know whether this was in introductory info, as she skipped over this quickly in order to use the e-scooter). She was wearing her cycle helmet, as this was her personal preference - feels this should be an option built into hire schemes (for both e-scooters and bikes).

She would like there to have been more signage on the route itself, or physical indication of zones ending, rather than relying on her phone to navigate. Because of their mixed experience and also it getting dark, they ended up getting a bus back from MediaCityUK to their bikes in Peel Park.

She would consider more self-powered modes of transport post-lockdown, partly to include more exercise in her day and also to reduce COVID-19 exposure risk; she cannot see herself using an e-scooter for this, but more likely to be on a bike. She would not consider owning an e-scooter as she couldn't justify the cost, but would consider using them as part of a hire scheme. She is unsure of the overall value of e-scooters and how they fit into the wider picture - sees them as mainly something fun - but not ideal for use on pavements (moving silently and quickly, startling pedestrians), or roads (less visible and feeling more exposed than a bike). Segregated cycle lanes would be a useful solution - she thinks segregated cycle lanes are the number one priority for using her bike more, and as a commuting option. She thinks cycling should be the main transport priority - as they bring more benefits (including physical/mental health) - and that e-scooters could fit into this cycling infrastructure.

E.3 Alexander

Alexander mainly drives a car and does not use public transport. He has used an e-scooter and thinks they could be useful for traveling around the city for work meetings. Would like to see the scheme expanded and remain dockless.

Alex uses his car to get around and doesn't take public transport in Greater Manchester. Would normally take train if travelling to London (95% of those journeys). Has used e-scooters a few times. He found them easy to use - after an initial 10 minutes of settling in, felt comfortable riding them on both pavements and roads and found them "great fun".

He sees e-scooters as desirable for short journeys within the city, to replace walking or taking a taxi and sees them as mainly useful for trips between 1-5 miles. He thinks e-scooters fit well into Salford/Manchester, which would be coverable by e-scooter and could see people starting to use them as a primary means of transport. He sees e-scooters mainly being used for either pleasure (for fun), or as the quickest way from point A to point B (e-scooters can be quicker than public transport, which is scheduled). Would personally see e-scooters as a viable alternative to his car when travelling between Peel Park Campus and MediaCityUK - he would never consider bus for this as it takes too long.

Another potential personal e-scooter use case would be trips around and between Manchester and Salford centres – he gives an example of a previous journey to a meeting in Manchester City Centre from the University of Salford Peel Park Campus for which he took a taxi that ended up getting stuck in traffic. He chose to walk back afterwards which turned out to be quicker. An e-scooter would have been ideal for this.

Alex used to live 12 miles from work which sometimes took 45 minutes in car, but he could not have seen himself doing this on an e-scooter. He doesn't see cycling to work as a viable option for him, as he wears a suit for work and doesn't feel cycling is very "professional" in that respect (carrying folded-up suit in bag, arriving hot and sweaty, requiring a shower). He thinks an e-scooter is a viable alternative for some journeys (unless it's raining heavily).

He thinks take-up for e-scooters is more likely to be for people younger than 60. Thinks e-scooters on pavements are ok, as long as their use is responsible, and, unlike with bikes, unsafe riding of an e-scooter can incur points on the rider's driving licence. He would not want to see 9-year-old kids on e-scooters (for their own safety), so there should be an age limit - and the easiest way to do this currently is through having a driving licence.

Alex would like to open the scheme out to more routes/areas in Salford than are currently part of the trial scheme. If the current scheme is to be expanded, he would prefer to see a dockless system in use, even though they require more setup than docked systems. He thinks that, with a dockless system and good cycle lanes, there could be more widespread take-up, and a significant drop in short taxi journeys. He doesn't foresee the same level of crime with e-scooters as happened with the Mobike scheme - mainly because of e-scooters' improved GPS-tracking. Overall, e-scooters help address the societal need to decarbonise our lives - citing Mark Carney, "you can't self-isolate from climate change."

E.4 James

James mostly uses a car to commute, although COVID-19 has changed that, and he is thinking about public transport for the future. He has not used an e-scooter but has seen them about. He would consider using one in the future if the scheme expanded.

James discussed how his view of transport has changed during lockdown. As a self-employed worker often commuting 9-10 miles to Salford, driving has often been his main mode of transport. However, with life slowing down during the first lockdown in April 2021, he noticed there is a bus service that can take him to work: 'so I can literally go door to door, and I'm thinking to myself, why am I not using public transport?'. He now thinks there is a sufficient combination of public transport, walking and cycling to get to work without always using his car, and thinks e-scooters could contribute to this.

He has not used an e-scooter but has started to notice them more and more on the roads and cycle paths, and thinks they are a great idea if they can encourage more people to become active or mobile.

He cannot see himself using the currently e-scooter trial because he does not live or work within the geofence, however if the scheme expands he could easily see himself using one to get home from the gym after a workout.

He feels vulnerable on the road when cycling, especially near busy roads around Monton and Eccles, but thinks riding an e-scooter might make him feel less vulnerable because there is a lower ground clearance and less distance to fall: 'there is a lot less that could go wrong than if you were on a road bike'.

He thinks we also need to take e-scooters seriously because of the wider environmental crisis. They may only be playing a small role in mitigating carbon emissions at the moment, but they have the potential to be scaled up. He uses Extinction Rebellion's protest on Deansgate, which led to parts of Deansgate being pedestrianised, as an example of how quickly change can occur when the political will is there.

E.5 Zara

Zara owns a car but has paused buying a new car because of changed mobility due to COVID-19. She sometimes cycles to work but has experienced harassment on her journey by men and this shapes her consideration of active mobility. She can imagine using a e-scooter to get around during the workday. She worries about accountability or regulation of e-scooters.

Zara owns a car and was planning on buying a new car prior to lockdown but has since decided not to due to how little she is moving around at the moment. She recognises her relationship with transport is changing. She owns a bike and usually cycles five miles from Prestwich to Salford, weather permitting, and takes a spare set of clothes in a bag. She has a mountain bike and has cycled frequently for five years, but she added that she would not voluntarily cycle through certain parts of Salford after experiencing aggressive behaviour by a group of young men. This difficult experience shaped her perception of safety as an incredibly important factor when she is considering how to move around the city using active mobility.

She has not used an e-scooter and struggles to see how they could work for her. However, she has Achilles tendinitis which means that walking for prolonged periods of time is painful, and therefore she avoids walking when possible. She recognises that the e-scooters could potentially play a role in alleviating pain when travelling in the city if the journey required is not possible to be done by bicycle. She elaborated that this could be possible, as cycling for her is all about the commute and her daily exercise. Once she arrives at work she does not anticipate using the bike again until she cycles home – she thinks e-scooters could provide a tempting offer for getting around for work meetings, as she would not usually use her bike for these trips and walking can cause her pain.

As a driver she expressed concerns about accountability and responsibility when it comes to the e-scooters. For example, if she is driving home and an e-scooter scratches her car while it passes by, who is accountable? She would also be apprehensive about using an e-scooter around Salford as she thinks the e-scooters make you stand out, and therefore make you more susceptible to unwanted attention.

E.6 Louise

Louise is primarily a pedestrian. She has not used an e-scooter and does not own a car. Her main concerns relate to pedestrian safety and she feels pedestrian voices are not always heard in the debate around e-scooter use.

Louise describes herself as a 'radical pedestrian' and defined her agenda as being solely concerned about the pedestrian within the context of the e-scooter scheme. She has not used an e-scooter and does not own a car. She mainly wished to emphasise her concerns about safety when it comes to e-scooters, and the broader utility of e-scooters in general. She feels like her voice is often lost beneath those of organised groups, such as cycling or micromobility groups, and feels that the rollout of these new schemes tends to push the priority of pedestrians in urban planning further down the agenda. She finds this frustrating and stressed that at some stage every day '100% of Salford taxpayers are pedestrians'.

When discussing this she cited the low traffic neighbourhoods (LTNs) in Salford as an example where she has felt there was a lack of consultation. The efficiency of e-scooters was also called into question when travelling across Salford, for example, if walking between Chapel Street and Piccadilly train station she feels it would be faster to walk than to get there by e-scooter if you only used the city's cycle lanes. She also expressed her concern about how fast and quiet the e-scooters are on the pavements when compared to bicycles or cars, and coupled with the fact that e-scooter users do not have to wear protective equipment or helmets she feels like they are putting themselves, others, and the NHS at risk. She has not seen the e-scooters from the Salford trial scheme but has seen multiple private e-scooter users navigating busy roads and junctions in Salford, often using the pavement.

E.7 Chris

Chris is a regular user of e-scooters in the trial area. He is a regular commuter cyclist and also used to take public transport once a week for his commute. He is positive about e-scooters but has identified a number of issues (e.g. glitchy app and batteries, pavement/road/cycle infrastructure quality) that need considering. He thinks the geofenced area should be expanded, but cautiously to learn from the mistakes of Mobike.

Chris has been using e-scooters regularly since the beginning of the trial - once or twice a week. He is working on the University of Salford Campus and mainly uses the e-scooters for fun, as "you can't travel very far on them." He uses them, for example, if he needs a break to go to the shop (which would have been a 5min walk is a 2-minute ride on an e-scooter). When taking an e-scooter for these short journeys, he acknowledges he's not getting as much exercise as if he had walked, so no physical benefits, "but mentally it's far better for me."

Chris would normally commute by bike - pre-lockdown would cycle 4 days per week and take public transport 1 day (usually Fri to enable going out after work). His commute to work is 10-11 miles each way. From door to door, cycling is quicker than public transport - though he does use the car occasionally (e.g. to move heavy equipment). His cycling is mainly utility cycling, but he does sometimes go out on a cycle with others on weekends.

His use of e-scooters has been limited by the operational area of the current scheme - it would be useful for him if the e-scooter trial was extended to include a route between Salford and Manchester Victoria. Some geofence speed restrictions on Peel Park Campus do not make sense to him - for example some sections are limited to 6mph even though they are long and straight. Although he would not want to make a flat speed restriction, he thinks some restrictions need to be better thought out.

Chris feels e-scooters are easy to use but the app can be glitchy, e.g. at times being unable to end a ride through the app, in which case he needs to close and re-open the app to end the ride. The e-scooters themselves can also be glitchy at times - sometimes slowing down in areas when you know there shouldn't be speed restrictions. Chris has had e-scooters run out of battery at times (e.g. when showing 28%). As a result of this he would now only take a fully charged e-scooter. Chris thinks e-scooters can take a bit of getting used to but being a competent cyclist has made it easier to become comfortable on the e-scooter (e.g. balance, coping with potholes and speed bumps).

Chris has mainly used e-scooters in pedestrianised areas of Campus. The exception was one journey between Peel Park Campus and Frederick Road Campus - for which he would not consider going on the road at all, mainly because of the speed of traffic.

Infrastructure would help cope with busy roads, but cycle lanes are often poorly planned or laid out. Chris thinks that whatever infrastructure is in place should be easy to use for there to be mass take-up. For e-scooters, docking areas aren't always marked clearly on the ground - there are some places that he knows are docking areas but aren't obvious to others. He also thinks some areas should have docking facilities – e.g. University Sports Centre – which is a COVID-19 testing area. He thinks there doesn't seem to have been an organic reviewing process for developing the scheme. Chris thinks there should be clearer markings on pavements, especially if the scheme is to be opened up to other areas and routes. You do not always want to be checking your phone to see the route. Chris hasn't been to MediaCityUK on an e-scooter yet but is intrigued to do so. He thinks this route also needs to be publicised better.

He is in favour of keeping a restricted geofence area and would not want it to be expanded too quickly, citing the Mobike scheme suffering because of being too big initially. Chris thinks it's better for the e-scooter trial to start small and grow organically. He could see it extending to Victoria station - then perhaps to the Oxford Road corridor - opening up nodes which are gradually joined up to learn about what's working. Chris is in favour of a docked system (designated parking spaces) for e-scooters and thinks that the Mobike scheme suffered because of the dockless system.

Chris thinks e-scooters could mainly replace short bus journeys - journeys of about 1 mile, with a max journey of about 15 minutes. He doesn't mind being on an e-scooter in the rain. He thinks e-scooters are less visually intrusive than bikes in a historic area of a city. However, e-scooters are less visible than bikes on a road which he thinks makes them that bit more vulnerable. He would be more comfortable using e-scooters on fully segregated cycle lanes (though not "Mickey Mouse" painted cycle lanes).

One unexpected outcome for him has been the impact of e-scooters on students' happiness. Students have been living on campus throughout lockdown, which has been a largely dull experience, and e-scooters "put a little bit of joy into their lives - there's a little smile on their face when they get on it."

E.8 Tanya

Tanya cycles with her family, commutes to work by car, find public transport inconvenient or insufficient and would like to buy an e-bike. She has never used an e-scooter. She thinks that safety is important and sees issues with both using e-scooters on the road (road safety) and on the pavement (pedestrian safety). She thinks that e-scooters could help us to change our transport habits.

Tanya lives in South Manchester, and cycles locally with her family. Cycling is their main way of getting about as a family. Commuting to work is a different matter, however – it is impractical for her to take public transport (requiring walking, several trams, and a train, which takes 1 hour 45 minutes). She also has to take her car to work to be able to manage picking up her children from school. She hates having to take the car. She lived in London for years, didn't have a car, didn't cycle, and relied on public transport. Here she finds trains are very poor, with infrequent services, and trains often getting cancelled. She had to overcome her fear of cycling in cities in order to cycle in Manchester - because public transport is not good enough in Manchester compared to London. Tanya would like to buy an e-bike, though she would not be happy to cycle one in the dark as she would feel nervous of the security risk.

Tanya hadn't thought of e-scooters as being a means of commuting – she thinks of them mostly for kids gadding about as a bit of fun – but it interests her to consider them as commuting option, and potentially attracting a different group of people to using them.

With the infrastructure that exists, she could see an e-scooter cutting down on walking time between public transport nodes. She would like to be able to hire an e-scooter or e-bike at public transport nodes. Tanya has never used an e-scooter. She feels an e-bike seems more stable – a bike on roads is scary enough. She has seen e-scooters in use in Copenhagen, which seemed to work really well, using segregated lanes. She would be scared to use an e-scooter on UK roads, however she might be more willing to use them if she could see other people using them on the road who seemed to be safe. She can see e-scooters being used in Low Traffic Neighbourhoods (LTN) and that would make her more confident and happier to jump on an e-scooter. For herself and her children, she would see e-scooters working only when and where road safety can be guaranteed.

Tanya would have no issue using e-scooters on the pavement, but having experience of bikes upsetting other pedestrians, she feels that there's a risk of e-scooters getting off to a bad start. She can imagine them being used well in a safe environment such as a university campus or hospital – and she would definitely use one in such circumstances. Tanya doesn't think helmets should be mandatory for e-scooters. She doesn't herself wear a helmet on her bike.

Tanya sees e-scooters as being more attractive to young adults or children, but she would worry about younger people who do not have much road experience using them. This could be managed through needing to have a bank debit card to hire them. She doesn't think a driving licence should be needed and sees this as a limitation for their take-up.

Tanya reflects that we need to get our cars off the roads – because of climate change, obesity, mental health – but the infrastructure needs to be there before the masses take up these alternative modes of transport. She is supportive of e-scooters and any criticisms she's raising are part of fitting e-scooters into a way of life where risk is massively reduced.

E.8 Tanya

E.9 Phil

Phil lives in the city centre and walks mostly, occasionally taking public transport. He's used an e-scooter in the trial area for fun and curiosity. He thinks they could replace shorter journeys previously made by bus or walking. He thinks safety and cost could be barriers.

Phil lives and works in the city centre. He walks everywhere, including his 5-minute walk to work. He cycles for longer journeys and pre-COVID-19, would take public transport. He has borrowed a car during COVID-19, purely to get out and about, further afield from the city.

Phil is aware of e-scooters "taking over Europe" and is interested in "innovative mobility solutions" in general. He has previously used an e-scooter once while in Lisbon with his girlfriend and has also used a friend's private e-scooter. The Lisbon scheme was designed well around the e-scooters - clearly laid out and signposted, using segregated cycle lanes. He was attracted to using e-scooters in Lisbon from seeing other groups of people using them.

He has used the Salford e-scooter scheme once - met up with friend from work and walked to the University of Salford campus. They just "messed about" around Peel Park Campus and only realised afterwards that they could have gone to MediaCityUK. Initially he took the e-scooter down the hill into Peel Park itself without realising that this was outside the geofenced area, meaning they had to push the e-scooters back up the hill. He thinks this geofence boundary could have been indicated on the e-scooter itself (e.g. a pop-up notification about leaving the geofence). Phil also had issues with the app when he left the geofence area - had to close and reopen the app to recommence the journey.

Phil used the e-scooter just for curiosity or fun, "because there's not much to do at the moment." It was really fun – faster than he'd remembered – and it was a different environment in Salford than in Lisbon. It surprised him how easily he was able to navigate around. While using the e-scooter he did think, "ooh this could be dangerous," for example, hitting pedestrians or being hit by a bus or large vehicle. But when he used one it was in a quiet environment at 5pm, so this wasn't a problem. He is not a risk-averse person and was happy to speed around – this added to the fun element for him – but he did not feel personally at risk. Other people were also messing about and having lots of fun.

Phil is curious about the route to MediaCityUK and is going to do this again with his friend. For such journeys, he is unsure whether e-scooters should be used on roads, and thinks helmets should probably be used in this case. Although he thinks e-scooters are less vulnerable than a bike and is fine with e-scooters being used on pavements. He thinks a wide segregated cycle lane is needed that would enable cyclists to overtake e-scooter users if they wished. Phil thinks that the development of infrastructure in Greater Manchester would be a great test bed for the rollout of e-scooters.

He thinks e-scooters would be perfect for times when he goes to Castlefield (up to 45-minute walk from home in the Northern Quarter). He used to use Mobike regularly for this type of journey - occasionally taking the bus. He would use an e-scooter to replace even a short walk in future if he came across one on the street. He would not want to rely on them for longer journeys – thinking about battery capacity for example – and would not feel confident or comfortable going to Chorlton or Manchester airport from Manchester city centre. He sees them more for short spokes out of the city centre – or also cross-town journeys, e.g. Levenshulme to Chorlton, which currently aren't served so well by bus.

Phil thinks e-scooters are a bit expensive, but he did not mind it for one use. If he was relying on e-scooters more regularly he'd have to tally up the cost versus public transport options. Thinking about what it would take to change his behaviour, and citing the Northern Quarter to Castlefield example, if this were to become a regular trip he would probably not take an e-scooter each time but would maybe start walking more and take e-scooter as an occasional "treat".

He thinks safety is probably the main barrier to people taking up e-scooters as part of their general behaviour. The friend who he used the e-scooters with is a committed driver, but he very much enjoyed the e-scooter experience and would use them again. Phil speculated on whether it was the fun element that he would need to change his behaviour. Citing the Mobike scheme, Phil wonders whether e-scooters are going to face the same issues of mass-vandalism if they are rolled out more widely. He's heard e-scooters are said to be vandal-proof, but he doesn't understand how this is the case. He thinks it would be a great shame if e-scooters suffered the same fate as Mobike – reflecting "Why can't we have nice things?"

E.10 Sue

Sue lives on the border of Manchester and Salford and walks and catches the bus for transport. She has used an e-scooter in Salford and found it enjoyable. She thinks an e-scooter could really work for her commute but has concerns about using an e-scooter on the road and in cycle lanes.

Sue lives between the city boundaries of Manchester and Salford and mostly walks everywhere, although she used to take the bus for part of her journey to work, pre-COVID-19. She does have a driving licence but doesn't feel confident to use a car, mainly given traffic and lots of roadworks where she lives. On the occasions that she's worked in the office during COVID-19, she has walked. She didn't feel comfortable on buses during the initial lockdown - as social distancing wasn't being managed very well and there was confusion over mask-wearing.

She finds the walk to work is long and not ideal (including likelihood of bad weather) but is likely the only option for her once office working returns. She will probably try to reduce her working days in the office for this reason. Buses aren't great and public transport options in general are "kinda sucky" around where she lives. She has considered cycling but thinks it would be "crazy" to consider cycling on such hugely busy roads. She is aware that work colleagues who cycle sometimes use the pavement in order to feel safe, but then get fined for doing so. The lack of infrastructure is the main barrier to her taking up cycling and she has seen a few crashes and near misses from walking around the city. Sue had been eyeing up the Mobike scheme while it was running but, by the time she got around to hiring one, "half of them were in the canal."

Sue has used the Salford e-scooter scheme once – it was a present for her birthday from her husband – and they both used them together last November. She discovered during lockdown that she could walk down the River Irwell to the University of Salford campus, and hiring an e-scooter seemed like a fun thing to do. They found it very easy to pick up and hire the e-scooters and felt safe using it on the university campus. She got the hang of it very quickly and found them "amazingly quick" - so much quicker than she expected.

Unlike with a bike, she felt that with the e-scooter it was possible to stop immediately and jump off if she ever felt unsafe because the brakes are instant, and you are in a standing position – which she found reassuring. She had to do this only once when going downhill where it was going a little faster than she was comfortable with – she was able to stop the e-scooter and step off easily. She was impressed by how much mobility she had on the e-scooter. She had to be conscious of pedestrians, especially trying to socially distance, but was able to manage this easily. Sue found the e-scooters good value – much cheaper than a car and possibly also cheaper than a bus. She thinks an e-scooter would be a brilliant option for her in future, and she would be very keen to use them for her commute.

She is unclear of how they are allowed to be used – e.g. whether they can be used in cycle lanes. She thinks using cycle lanes are the best place for using e-scooters, though she has no idea of what cyclists would think of this or how they would respond to e-scooters being used in cycle lanes. Sue would prefer to use a helmet while using an e-scooter but isn't sure how this would work. Would she have to carry one around with her all the time? Having helmets available when picking up an e-scooter would be hard to manage in the age of COVID-19. How would they be cleaned etc? She would probably buy a helmet herself if she was to use an e-scooter regularly.

Ideally she would love to use e-scooters on the pavements as she also finds cyclists a bit intimidating (expensive bikes, Lycra-wearing, and a little bit snobbish). She would not use an e-scooter on the road at all for safety reasons – though she thinks an e-scooter could possibly be safer than a bike on the road as it has faster acceleration to be able to swerve instantly. Sue thinks the need to have a provisional licence is "genius" as it prevents kids from taking them out, and for people using them to have a bit of road sense.

On the e-scooters' visual fluorescent design, she thinks they're marketed at a "20s male" - rather than herself (40s female) but she thinks it's interesting to think about them as more "functional". She also found it reassuring that there's a tracking system in place to ensure that if an e-scooter were to end up in a canal, it could be traced to the person through their driving licence. If legal issues were sorted out, she would like to take e-scooters onto country paths and National Trust grounds and parks – and hopes that tracking could be sorted to enable this kind of use case.

She is considering buying an e-scooter but is more likely to use one as part of a hire scheme, even if using on regular basis – partly because storage space is an issue in her house. She has found it irritating that she cannot hire an e-scooter around her house. She thinks that Salford and Manchester aren't really talking to each other and would like to see more integrated systems that aren't cut off by authority boundaries. She would like to use e-scooters around and across the Manchester/Salford city centre region. She acknowledges that it's been a challenging time to launch such a scheme – but she really hopes e-scooters can work.

E.11 Tom

Tom has never used e-scooters but has a strong interest in them. Cycling is his main mode of transport; he's really into cycling and is also involved with the Manchester cycling community.

Tom used to use buses while he was a student, and he is hopeful that buses in Greater Manchester coming under public control might make it easier for him to use buses (e.g. on a day with bad weather) - mainly due to cost and convenience. He doesn't drive but is currently learning - this would be to enable longer journeys such as UK holidays without having to rely on expensive longer train journeys. He currently finds the tram the most convenient option for his commuting needs as an occasional alternative to his bike (e.g. if transporting heavy equipment).

He feels cycling infrastructure has improved in Manchester – though there's a real shortage of cycle parking. The development of the cycle lane on the Curry Mile involved a lot of lobbying from local businesses which in some sections pushed cycle lanes onto the pavement, meaning that cyclists and pedestrians often come into conflict. He'd like to see some of the temporary cycle lanes that have been developed during COVID-19 kept. He has noticed that in some cases where driving lanes have been reduced to make way for a cycle lane, the car traffic hasn't been noticeably affected. He feels that cycling infrastructure simply needs to be invested in, rather than waiting to be justified, to encourage mass take up of cycling.

He's seen people use e-scooters and they look like fun. He thinks they could be useful for groups of people moving through a city, for example they could be a good way of showing a visitor around a city who isn't so comfortable with cycling. He doesn't personally envisage using e-scooters as a commuting option, but more as a "recreational vehicle" and would like to try e-scooters out of curiosity. He also thinks they could be useful for getting from one train station (or other public transport node) to another. Tom hasn't used e-scooters because he hasn't come across one for hire on the street and they're not operational in the area where he lives. He's seen e-scooters in use around the Manchester Metropolitan University (MMU) campus – and is keen to try out

the e-scooters in Salford. He plays a lot of sport and regularly injures himself, and so could see e-scooters as being a viable mode of transport for him in such a scenario. He can also see them being useful for others with mobility issues, as a potentially empowering mode of transportation. He has a personal interest in architectural photography and sees an e-scooter as an "optimal vehicle" for this – unlike on a bike, where he needs to stop, lock the bike, get equipment out of a pannier, and walk between different spots. An e-scooter would enable him to carry a camera on his person and take pictures with much more immediacy. He also thinks that this aspect makes them useful for tourists in a city.

He can see e-scooters being used on the road in the same way as cyclists use the road, and also sees e-scooters fitting into cycle lane infrastructure – he doesn't see any conflict between e-scooters and bikes as they have roughly similar speeds. Pavements are more problematic, as pavements vary so much across Manchester (e.g. width). He thinks that pedestrianised areas of university campuses would be a suitable environment for e-scooters, otherwise e-scooters are probably best on roads or cycle lanes.

Anything that increases the visibility of an alternative mode of travel to cars is a big positive for Tom. He cites Copenhagen's heavily-used cycling infrastructure – he sees e-scooters fitting into this kind of infrastructure as "a part of active travel, a melee of different people", and sees it as becoming "a normalised part of the travel landscape". Knowing Manchester's roads as a cyclist, he thinks that road surfaces need to be improved to be safer for e-scooters (e.g. going through a pothole on a seven-inch wheel could be dangerous). Thinking about others using e-scooters, he points out that cyclists would be used to taking measures for their road safety (e.g. doing an over the shoulder check), but that this would not be the case for the general public. He isn't sure if there's enough data on e-scooter crashes to establish whether helmet wearing is necessary. For Tom, anything that cuts out personal car journeys that do not need to be made is great. Now that we have the technology – i.e. battery capacity, smart phones, and wireless payment – it makes sense to move forward with e-scooters.

Figures

Healthy
Active
Cities