One year in the UK

Voi's Policy Report
September 2021

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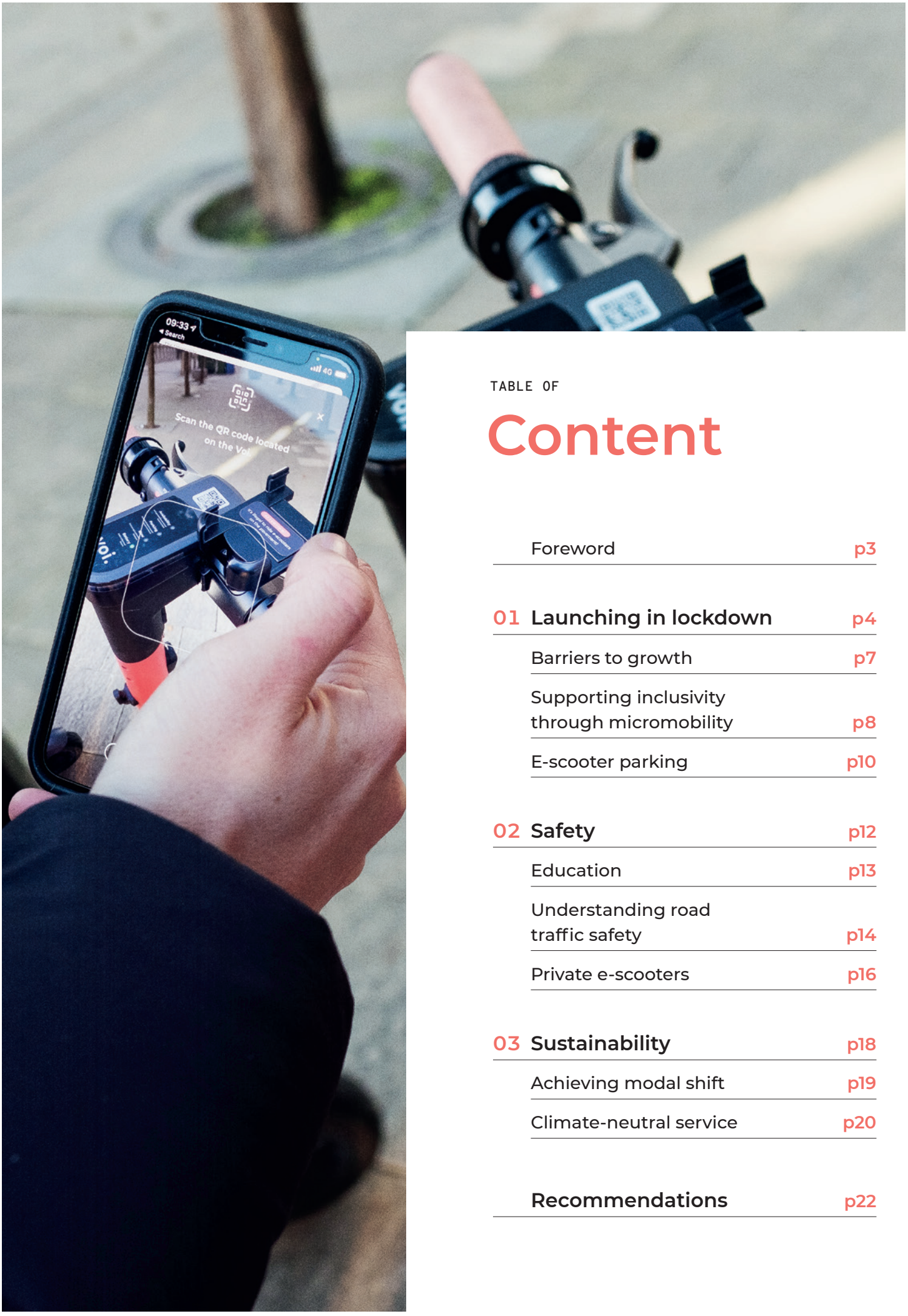


TABLE OF

Content

When I joined Voi in May 2021 as General Manager for UK and Ireland, I was excited to be taking the helm of the market leader in one of the most fast-moving and innovative sectors in transport. With licences won to operate over 60% of shared e-scooters on UK roads, it was time to deliver on our commitment to supporting towns and cities across the country in their climate change and sustainability ambitions.

The introduction of e-scooter trials in summer 2020 marked a huge step forward for sustainable transport in the UK. Having opened up to shared micromobility later than mainland Europe, the UK was quickly catching up: the awarding of the West Midlands Combined Authority trial to Voi represented the largest single geographic service area in Europe, followed by the launch of the London trial later in 2021. The government has some ambitious targets as part of its sustainability agenda, not least its legal commitment to achieve net-zero emissions by 2050, as well as its target of 50% of all urban journeys being made by walking or cycling by 2030. It is increasingly clear that e-scooters are a crucial part of the long-term solution.

Voi is currently operating e-scooter services in 16 locations across the UK, ranging from large cities such as Birmingham and Liverpool, to smaller towns including Kettering and Wellingborough. Our mixture of on-demand rental scooters, long-term rental and e-bikes has proven popular with our city partners and members of the public, with Voi vehicles being used for over 5.4 million rides in our first twelve months of operations. Even more exciting is that we are seeing real, meaningful modal shifts: 39% of these journeys have replaced car trips. When we take into account the dampening impact COVID-19 and lockdown measures have had on the travel sector during this time, the potential growth for micromobility in the UK is truly staggering.

Throughout our trials, we have been proud to work closely with our council and combined authority partners, as well as stakeholders including local police forces, NHS trusts, the visually-impaired community and wider disability organisations. This collaboration has played a significant part in the success of our e-scooter trials and I am excited to continue to work with our partners for as long as we are operating.

I'm delighted to be publishing this report to mark Voi's one year anniversary in the UK, along with our recommendations for the future regulation of the sector. The future is bright for both Voi and the micromobility sector.

Jack Samler, General Manager, UK & Ireland
Voi Technology

CHAPTER 1

Launching in lockdown

Following the completion of procurement processes for rental e-scooter trials over the summer period of 2020, operators across the country had the task of preparing to launch new services in the midst of the COVID-19 pandemic. This meant not only conducting extensive stakeholder engagement, vehicle testing and city planning that goes into the launch of every service, but also designing trials which would allow users to ride safely in a socially-distanced and hygienic manner.

In addition to the Department for Transport safety requirements such as a minimum user age of 16 and making it mandatory for riders to hold a provisional or full driving licence, further measures were necessary. These included installing copper tape on the handlebars of all vehicles to reduce traces of COVID-19, introducing new disinfection measures to keep vehicles clean and creating new in-app alerts to direct riders to the UK government's COVID-19 online guidance.

Operators faced the added complication of designing a service that deliberately directed users away from public transport - a direct contradiction to the usual role of micromobility as a first/last mile solution. Yet this was a key objective in the early stages of the e-scooter trials: to create a new socially distant transport mode,

especially for key workers, because of the significantly reduced capacity on public transport networks.

Voi's first e-scooter service in the UK was launched in Northamptonshire on 3 September 2021, with an operating area focused in Northampton town centre. Concerns that the UK would not take to e-scooters in the same way continental European countries had were proved to be unfounded: early adoption rates for scooters in Northamptonshire were extremely high, with the service averaging over 5 trips per vehicle per day (TVD).

Within three months of launching in Northampton, we had progressed to operating trials in Birmingham, Liverpool, Cambridge, Bristol and Bath, all of which showed similar levels of popularity in early stages of launch. Trials in Bristol and Birmingham proved to be particularly popular, with vehicle utilisation hitting seven rides a day in the first weeks of operation. This placed our UK cities as some of the most utilised fleets across Europe.

CASE STUDY

Micromobility as a force for good

Following the early popularity of the e-scooter trials in the weeks following launch, services were seriously impacted by the winter lockdown period, with the public urged to work from home and only travel when absolutely necessary. However, this presented an opportunity to utilise micromobility as a force for social good and support local authorities in their efforts to combat the pandemic.

Following news of the pending November lockdown in mid-October 2020, Voi's operational team in Liverpool began engagement with local NHS trusts to ensure e-scooters would be available to hospital workers and emergency service staff across the city. To achieve this, Voi identified new nodes (e-scooter drop-off points) in secure locations outside Alder Hey Children's Hospital, Liverpool Women's Hospital and the Royal Liverpool University Hospital, as well as a number of other local NHS sites. Recommended parking locations were identified at each site and Voi's third-party logistics partner, which deploys scooters from the Voi warehouse to our drop-off points in the city, were instructed to ensure scooters were always available before the end of identified hospital shift patterns.

In addition to the operational changes, Voi also raised its Voi4Heroes concession to become 100% free during periods of national lockdown. Since the trial in Liverpool was launched in October 2020, over **160,000 free or discounted rides have been taken by NHS staff and emergency service workers** across the city.

Following the success of Voi's early launches in 2020, further trial schemes were launched over the winter and early spring months in Sandwell, Kettering, Coventry, Oxford, Corby, Rushden & Higham Ferrers, Wellingborough, Portsmouth, Southampton.
Voi also operates a small service in North Devon in partnership with a local college, with vehicles provided to staff and students on a monthly rental basis as well as an e-bike service in Peterborough.

Voi now operates trials in 16 locations across the UK.

Services across all trial areas experienced a drop in ridership over coming winter months as worsening weather and lockdown restrictions took hold. However, as services entered into spring and summer, with travel opening up again as lockdown measures were lifted, each trial area saw a significant uplift in usage.

Despite the e-scooter industry as a whole still being in its infancy, its popularity in the UK was to be expected following evidence from continental Europe. A micromobility study by research organisation 6t found that the adoption rate of e-scooters in Paris was four times faster than the e-bike scheme Vélib, with e-scooters taking only six months to achieve Vélib's two-year mode share.[1] A similar report published

1 (6-t), Uses and users of free-floating e-scooters in France (June 2019)

in 2018 by Populus, *'The Micromobility Revolution: The introduction and Adoption of Electric Scooters in the United States'*, found similar conclusions, with e-scooters experiencing significantly higher adoption rates than ride-hailing, bike-sharing or car-sharing companies, despite only having been introduced in US towns and cities for a number of months at the time the research was undertaken.[2]

The popularity of e-scooter services suggested in this research has continued to be experienced in towns and cities across the UK. Despite launching most trials with small operating fleets of between 50 to 100 vehicles, and operating areas largely concentrated in town centres, we were proud to reach one million UK scooter rides by March 2021, quickly growing to 2.5 million rides by June 2021.

By September 2021, we had reached over 5.4 million rides. 555,000 of these rides were free or discount journeys taken by NHS workers and emergency service staff.
It is clear that when developed in partnership with local authorities and city stakeholders, e-scooter operations have the potential to significantly improve how we work and travel, serving as a sustainable first/last mile solution and providing a flexible, accessible alternative to motor vehicles.

The significant demand shown for e-scooters demonstrates the need for a new regulatory framework to be established specifically for e-scooters. As an operator, Voi recognises that e-scooters are still a new mode of transport and that regulation is vital to ensure safe operations. However, with e-scooters proven to be much safer and more sustainable than cars, as we explore in this report, it would be counter-intuitive to continue to view the two vehicles as similar and requiring the same regulations, as they currently are. Similarly, e-scooters cannot be considered the same as pedal bikes and so there is clearly the need for them to be placed in another category of on-road vehicle, one that properly captures e-scooters.

Barriers to growth

Despite the popularity of e-scooters amongst riders, Voi trials have faced a number of challenges that have impacted uptake and acted as a barrier to entry for users. For example, the slow pace of growth allowed by some local authority partners, with councils taking a cautious approach to expanding operating areas and scaling fleets. This has often been as a response to negative media coverage and anecdotal concerns from members of the public. Consequently, some large areas can only be served by a small number of scooters, or they are restricted to certain areas of cities, leaving large parts of the local population with no access to the service.

As a result, e-scooter services have not been available to all those who wish to take advantage, causing potential users to resort to other forms of transport, including cars or potentially unregulated private scooters. Local authorities and operators should adopt a clear framework for decision making, with data-driven metrics at its core.

Another barrier to encouraging e-scooter uptake and driving modal shift is the requirement for all users to have a driving licence before riding an e-scooter. Proponents of licence requirements for

2 Populus, The Micro-Mobility Revolution: the introduction and adoption of electric scooters in the United States (July 2018)

e-scooters argue two main points: first, that the requirement of a licence demonstrates road awareness from a user who has passed their driving test; and second, that the requirement is necessary for police enforcement as users caught riding illegally will receive points on their licence, similar to a driver.

However, what such campaigners fail to take into account is that a user can ride with just a provisional licence. This means a rider can simply pay the registration fee for a provisional licence and ride without ever taking a driving lesson or test. As for police enforcement, there are already comprehensive measures in place to tackle anti-social behaviour amongst cyclists, including a maximum £1,000 fine for cycling under the influence of drink or drugs and a maximum £2,500 fine for dangerous cycling. Similar measures could easily be introduced to ensure safe riding amongst e-scooters.

Supporting inclusivity through micromobility

As we work to achieve our mission to create cities built for living, free from pollution and congestion, it is vital that the most vulnerable in our society aren't disbenefited. That is why we continue to work closely with regional and national disability charities, in particular visual impairment organisations, to ensure that our schemes do not make cities any less safe for vulnerable road users.

Voi has worked with local authorities and regional partners to create regular platforms across all trial areas where local charities and campaigners can voice any concerns to Voi over the impact of e-scooter rollout, and work with our local teams to identify solutions to potential problems. Through these meetings, Voi has been able to implement significant changes to local services, making our trials much safer for those with visual impairment and other disabilities, whilst maintaining easy access to vehicles for our users. Such changes include: identifying new drop-off points for vehicles and parking locations; removing any locations deemed unsafe by local charities; and strengthening our three-strike policy to deter poor riding.

One of the biggest concerns raised to Voi is when scooters are parked poorly, creating potential trip hazards for those with sight loss as well as wheelchair users. To address the issue of street clutter and bad parking, Voi educates its users through in-app messaging and our online RideLikeVoila training school, as well as issuing a £25 fine to anyone caught parking illegally through our End Ride Photo (ERP) feature.

In March 2021, Voi became the only e-scooter operator in the UK to provide bespoke e-scooter parking racks as part of our trials, with the introduction of the street furniture across a number of our towns and cities. Having physical infrastructure in place not only makes it easier for users to identify parking locations, but evidence has shown that implementing racks can significantly reduce parking clutter.[3]

Throughout our operations in the UK we have consistently worked with disability organisations, whose members have lived experience of sight loss, and engaged these groups on solutions to improve our service. In early 2021, Voi commissioned the Royal National institute of Blind People (RNIB) to provide consultancy support on the

3 TØI rapport 1821/2021 (February 2021)

design of the second version of our parking racks. The RNIB supported Voi's central product team in Sweden throughout the development phase of the new racks, providing feedback and input on designs.

In May 2021, Voi launched the second model of its racks, with a significantly improved design that includes new side panels to better prevent e-scooters from falling and can be detected by pedestrians using a cane. In addition, this new street furniture has black and yellow contrasting colours across the rack to make the infrastructure more easily identifiable to visually-impaired people. Over 60 RNIB-approved parking racks are now in place across Voi trial towns and cities in the UK.

"The Voi team has worked enthusiastically to better understand the concerns and needs of blind and partially sighted people and we look forward to testing the resulting redesign of their e-scooter racks. We also look forward to learning about the deployment and impact this redesign has for blind and partially sighted people when they are trialled in our towns and cities."

John Worsfold,
Strategic Innovation Implementation Manager
RNIB

In another industry first, Voi is also working with the RNIB and the Thomas Pocklington Trust, who support Sight Loss Councils across the UK, on the development of our Acoustic Vehicle Alerting System (AVAS), an artificial sound which alerts nearby users when a vehicle is approaching. The testing and roll-out of our AVAS solution, currently in operation across Birmingham, Liverpool and Bristol, will help make pedestrians with sight loss feel safer as they will have the assurance of being able to hear when an e-scooter is nearby.

To ensure the pursuit of sustainable travel does not come at the expense of vulnerable road users, it is important that groups such as the RNIB and Thomas Pocklington Trust continue to be given a platform to engage with e-scooter operators to voice their concerns and provide support on innovative solutions.

E-scooter parking

With e-scooter parking largely taking place on pavements, it is important that impacts on pedestrians are eliminated. Across our UK trials, we operate a number of different parking models to ensure this, including:

INCENTIVISED PARKING users can park across most of the trial area (with the exception of outside schools and other agreed sensitive locations), however they are provided with credits off their next ride for parking in certain areas identified by Voi as particularly safe, ie where existing parking infrastructure is in place or a pavement is particularly wide.

MANDATORY PARKING users must begin and end their ride within one of the predetermined Mandatory Parking Zones,

(MPZs) with riders unable to end their journey in the app if they are not within an MPZ.

MIXED PARKING utilises both incentivised and mandatory parking models across an operating area, with mandatory parking in place in a town centre with high footfall and incentivised parking in less congested areas.

Across Voi's trials we also use a variety of parking infrastructure including: virtual parking locations which appear in the Voi app but are not sign-posted; painted floor bays which indicate a specific location for e-scooters to be parked; and our bespoke parking racks as detailed above.

All of these measures, including further actions such as our End Ride Photo (ERP) feature and £25 fine for illegal parking, have led to improved parking by Voi users with trials averaging 88% 'Good Parking' as determined by our ERP - Voi user support agents classify end ride photos as Good Parking, Not Ideal Parking or Bad Parking depending on whether the scooter shown is compliant with our own parking standards. Users whose photos demonstrate not ideal or bad parking receive educational material and fines. However, as e-scooter operations across the country scale to meet growing demand, it is important that operators are given the freedom to respond to this demand by providing the necessary parking. Currently, trials are mostly limited to parking locations on pavements, which can lead to potential trip hazards for pedestrians. Despite the introduction of painted bays and racks having a positive impact on parking, the roll-out of this infrastructure has been slow at times due to the lengthy signoff process necessary for installing new street infrastructure. Local authorities and operators should work together to ensure the priority and resources allocated to improving air quality and achieving modal shift at a strategic level, is reflected on the ground, with processes streamlined to ensure services and parking options are as accessible and safe as possible.

Local authorities should work with operators to identify on-street solutions for e-scooter parking. As e-scooter journeys continue to replace car trips, on-street parking would take advantage of the urban space freed up as a result of fewer cars on the road and provide a solution which keeps pavements safe for pedestrians and vulnerable road users.

CHAPTER 2

Safety

The safety of e-scooters and other forms of micromobility has led to significant debate during the course of the e-scooter trials. Concern from other road users and safety campaigners has gained considerable media attention, despite data from micromobility operators showing that e-scooter accident rates are in fact extremely low: currently only one in 200,000 Voi rides results in a serious injury.[4]

Just like many cities and governments across Europe, Voi has a Vision Zero target. This means eliminating all severe injuries and fatalities in the value chain by 2030. Reaching this target will require a long-term strategic approach, with cooperation from local authorities, national government and operators to develop innovative solutions to safety problems. This is why in 2020 we launched Voi's Global Safety Council, inviting experts across the transport industry to help us identify the best ways to improve safety on the streets we operate in.

The legalisation of e-scooter trials in summer 2020 saw the introduction of a new transport mode on UK roads for the first time in over 100 years. Before trials were allowed to begin, operator vehicles were subject to extensive testing by the

4 Voi, Annual Safety Report (June 2021)

Department for Transport and the Vehicle Certification Agency (VCA) before use, with regulations including a maximum speed limit of 15.5mph, maximum vehicle weight of 55kg and maximum motor power of 500W.

During the first twelve months operating in the UK, we have used two vehicle models across our trials; the Voiager3X and the Voiager4 (V4). Both vehicles take advantage of safety innovations including: 10-inch non-pneumatic tyres to increase shock absorption and ease impact from potholes; double hydraulic suspension for smoother riding; and redundant braking with two mechanical and one electric brake system for safer stopping. The V4 also includes turn indicators, allowing riders to easily communicate with other road users.

Furthermore, Voi has gone above and beyond current Department for Transport regulations to increase safety across our trial areas, increasing the minimum user age required to ride a Voi scooter from the government-recommended 16, to 18 for all our services (with the exception of North Devon), and also capping our vehicle maximum speeds at 12.5mph, instead of the 15.5mph permitted by the government.

Education

One of the most important methods to ensure users are safe on the roads is through education, with data suggesting that beginners are more likely to end up in an incident during their first ride. Education supports riders in understanding the rules of the road and learning how to ride an e-scooter in a way that keeps them and all other road users safe.

At Voi we take an extensive approach to educating our users through a number of channels. Before any user is able to take their first ride, they must complete our in-app onboarding process. This feature includes: educating riders on where e-scooters can and cannot be ridden; how to stay safe on the roads; warning against anti-social behaviour such as twin or drunk riding; recommending the use of a helmet; and ticking Voi's User Agreement, which repeats the warning against illegal riding practices such as riding under the influence.

In addition to in-app education, in 2019 Voi launched the world's first online e-scooter traffic school, RideLikeVoila, which guides users through the rules of the road in their country. The RideLikeVoila traffic school was originally developed in collaboration with the NTF (National Society for Road Safety in Sweden) and has been tailored for the UK market following collaboration with DriveTech from the AA, the world leader in fleet risk, safety management, and driver training. Over half a million riders across Europe have completed the school, learning how to ride and park safely in accordance with road traffic laws in their country.

Following the popularity of the trials during their early stages, it was also important that new users were given the opportunity to take further e-scooter training courses and receive in-person educational support once social distancing guidelines permitted. To this end, in May 2021 we launched our first in-person safety events across our trial areas. The pop-up events, still ongoing, provide new and existing riders the opportunity to receive ride demonstrations on how to ride and park an e-scooter safely, as well as having the chance to ride an

e-scooter along a course in a safe and controlled environment. Voi also runs regular safety webinars for new users and riders who are unable to attend in-person training.

As a new mode of transport on UK roads, the introduction of e-scooters understandably raised some concern from other road users, who may not know how to react when an e-scooter rider is nearby. This is why, in March 2021, Voi teamed up with DriveTech once more to create an online learning module to help members of the public become more familiar with e-scooters, identify risks on the road and learn what they can do to encourage road safety.

Understanding road traffic safety

In order to achieve Voi's Vision Zero target by 2030, it is important to understand why incidents happen with e-scooters, so that we can work with users and our city partners to develop solutions.
Only through transparency and learning from what has happened will we be able to identify the safety performance factors which best improve e-scooter safety.
This is why we regularly share accident data with our cities and police forces, to help us understand where accidents are happening and why, and identify operational solutions such as implementing slower speed zones in particularly dangerous areas, or shortening operational hours on weekends

to deter riding under the influence of alcohol.

In February 2020, the International Transport Forum (ITF) published its *'Safe Micromobility'* report, which found that over 80% of e-scooter and cyclist rider deaths result from crashes with heavier vehicles.[5] The report analysed accident data from the ITF's Safer City Streets network in inner London, Paris, Rome, Milan and Bogota and found larger motor vehicles to be the number one cause of death for micromobility users. In contrast, the report found that ***"the risk of being killed on a shared standing e-scooter trip is no different from that of being killed on an average bicycle trip, and substantially lower than on an average motorcycle trip."***

Voi's internal data has shown that 16% of accidents occur during a user's first ride. This creates the appearance of e-scooters being less safe than they are, with users more likely to make mistakes before they become accustomed to riding a new vehicle. The effect of e-scooter riders being at greatest risk in their early days of their micromobility journey is supported when looking at Voi's internal survey data. In December 2020, Voi conducted a Winter Survey of over 1,000 UK users which found that 75% of respondents said they 'Agree' or 'Strongly Agree' with the statement 'I feel safe riding a Voi e-scooter.' When the same question was asked during our Summer Survey, conducted over July and August 2021, over 90% of respondents said they 'Agree' or 'Strongly Agree,' showing a clear trend towards safer rides as e-scooter operations grow.

In addition to understanding why accidents happen, it is important to know what factors play a part in users feeling safe when riding. As part of our 2020 Winter Survey, we asked UK riders how important different factors were for their safety when riding an e-scooter, with the following results:

Relative importance of different safety factors for e-scooter riders

	Not important	Important	Very Important	Total	Weighted average
Quality of e-scooter	2%	31%	68%	1,005	2.66
The speed of e-scooter	7%	42%	51%	1,005	2.44
Having a helmet to hand	53%	33%	14%	1,005	1.61
Being visible at night	2%	31%	67%	1,005	2.65
Quality and sufficient cycle lanes	7%	37%	56%	1,005	2.49
Clear traffic rules	7%	41%	52%	1,005	2.45

5 The International Transport Forum, Safe Micromobility (2020)

The response with the highest weighting was 'Quality of e-scooter', with 98.41% of respondents describing this as 'Important' or 'Very Important.' This was closely followed by the need for riders to be visible at night, with 98.01% of respondents describing this as 'Important' or 'Very Important.'

As well as the safety measures mentioned above, Voi has the following additional safety enablers: in-built reflectors; measures to control speed; incentivised helmet use; and education to users on traffic rules.

The remaining factor to implement for improved user safety is the need for quality and sufficient cycle lanes. Despite 93% of respondents saying quality cycle lanes were either an 'Important' or 'Very Important' factor in their safety whilst riding, only 38% of respondents to the same survey described the cycle lanes in their city as 'Good' or 'Very Good.' Modal shift has the potential to significantly improve road safety through the replacing of cars with lightweight, sustainable alternatives such as e-scooters and bikes. However, it is imperative that improved cycling infrastructure is prioritised over road space for larger motor vehicles.

Private e-scooters

In all Voi trial towns and cities our local teams work closely with police forces, helping our staff to understand the challenges faced by police officers. We continue to work collaboratively to find operational solutions, such as amending weekend operating hours to deter riding under the influence, and removing e-scooter drop-off points during weekends with large events to prevent anti-social behaviour.

Across all our trial areas, the number one concern raised by police stakeholders is the rise in private e-scooter use, which remains illegal on UK public roads. A particularly concerning piece of feedback from our police partners in several towns and cities has been that the riders they have stopped with private e-scooters have manually altered their vehicles to allow them to travel speeds of up to 50 mph.

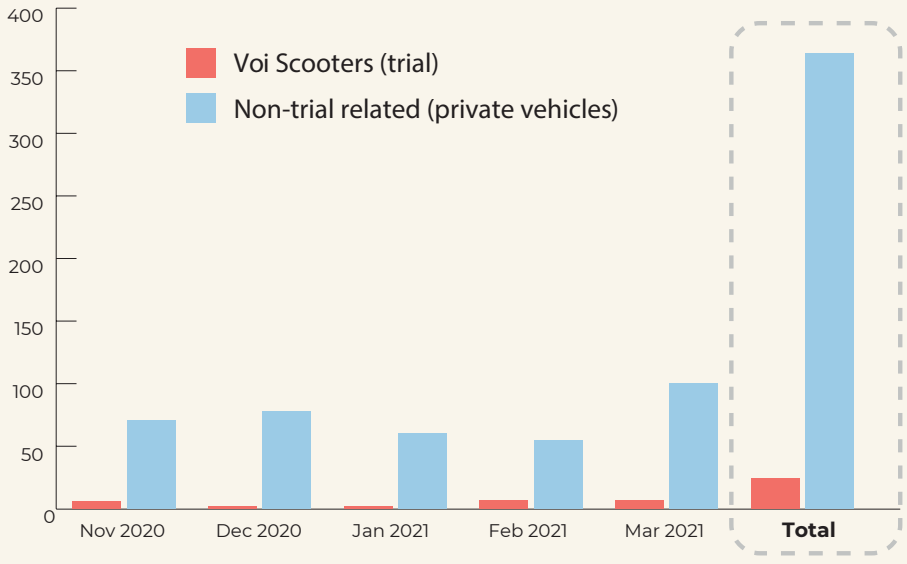
As a more sustainable alternative to heavy motor vehicles, Voi supports in principle the notion of private scooter use. However, they must be regulated in a safe and appropriate manner. Any regulation that permits the use of private e-scooters must ensure a level-playing field between rental and private vehicles, with strict provisions in place over insurance and vehicle specifications for personal scooters.

SAFETY IN NUMBERS

Police STORM logs - Voi vs private e-scooters

In November 2020, Voi began a project with Avon and Somerset Police exploring the local safety impact of private scooters against rented scooters in Bristol and Bath, both Voi trial areas. For five months, Avon and Somerset Police provided monthly reports detailing the number of STORM[6] logs relating to private and rental e-scooters registered by officers that month. The results were as follows:

The data shown reveals that over a five month period, Voi rental e-scooters accounted for just 6.5% of e-scooter police reports in the region, with the remaining 93.5% relating to private e-scooter use.



6 (STORM is the Police Command and Control system, used to task and dispatch officers)

CHAPTER 3

Sustainability

The rise of micromobility across Europe and the US in recent years has been viewed by many as a step change in the way we travel, with vehicles such as e-scooters and bikes providing a zero-emission, lightweight alternative to heavier motor vehicles. Through adopting shared mobility schemes, local authorities have the potential to significantly reduce their carbon footprint through modal shift and first/last mile uptake.

A paper published by the Department for Business, Energy and Industrial Strategy in February 2021 noted that transport is the largest emitting sector of greenhouse gases in the UK, responsible for 27% of all emissions.[7] The paper goes on to note: ***"the main source of emissions from the transport sector is the use of petrol and diesel in road transport."***

If the UK is to achieve its target of net-zero by 2050, it's clear that addressing road transport emissions is absolutely vital. The popularity of the e-scooter trials to date and the increase in cycling during the pandemic - cycling has increased by 46% in the last twelve months, the largest increase in postwar history[8] - has shown that there is a clear demand amongst the public for safe, sustainable alternatives to traditional road vehicles.

7 BEIS, 2019 UK Greenhouse Gas Emissions, Final Figures (February 2021)
8 DfT, Gear Change: One Year On (2021)

As part of the government's *'Decarbonising Transport - A Better, Greener Britain'* report, published in July 2021, the Department for Transport has set out a new ambition for half of all journeys in towns and cities to be cycled or walked by 2030, with a target of developing a 'world class cycling and walking network in England by 2040.' As a sustainable, zero carbon, affordable and safe transport mode, e-scooters have a huge role to play in enabling this modal shift and must not be left behind as part of these plans and become an integral part of Active Travel policy plans across national and local government. Despite an e-scooter journey requiring less activity to complete than cycling or walking, the wider health and wellbeing benefits of scooting are well documented through better local air quality, improved mental health for users, and the shift towards shared transport presenting less threat of accident or injury to riders.[9]

Achieving modal shift

To achieve the targets set out by the government is to achieve a major modal shift from single occupancy cars to more sustainable forms of transport, especially in urban areas. A key objective of any e-scooter service has to achieve long-term modal shift. With over 60% of car and van journeys taking place in the UK single occupancy,[10] there is significant potential for single-occupant vehicle journey displacement.

To understand our mobility impact, we use the same methodology as transport researchers to estimate modal shift. In our 2021 Summer Survey, 39% of users told Voi that they would have used a car for their last journey if they had not used a Voi scooter. The implication here is that across the whole of our 5.4 million journeys taken so far, **over two million car journeys** have been replaced across Voi towns and cities since the launch of our trials in 2020.

To measure the equivalent CO2 reduction, we use our Carbon Calculator, developed in collaboration with Dr. Manos Chaniotakis, Lecturer in Transport Modelling and Machine Learning from UCL's MaaSLab. It is based on our ride data, local car replacement rates collected via user surveys (Summer 2021, N = 8897), the UK government's CO2 and PM2.5 emission factors for cars and buses (DEFRA/ BEIS, 2019[11] [12]) and Voi's carbon emissions based on the Life Cycle Assessment conducted by EY and our carbon neutrality. (All emission reductions are calculated in CO2 equivalent units, meaning they factor in all other GHG emissions.)

Using these calculations, we estimate that over 1,100 tonnes of CO2e and 183kg of PM2.5 have been saved thanks to Voi e-scooter use in Britain. To ensure the improvements in air quality resulting from e-scooter services are not lost, the UK government must permit the continued operation of e-scooters across trial areas. If e-scooter trials were to be paused whilst a new regulatory framework were introduced, or worse cancelled altogether, we would likely see a huge shift back to personal car use. Voi's Summer Survey found that over 30% of Voi users would return to using their car if the trial in their area were stopped. To further support car replacement rate and decarbonisation, trials should also be scaled to reach critical fleet density and operating zones to be able to provide convenient and accessible alternatives to private cars.

9 London Cycling Campaign, micromobility and active travel in the uk (March 2020)
10 Statista, Car and van single occupancy rate in England between 2002 and 2018
11 BEIS, 2019 Government greenhouse gas conversion factors for company reporting (August 2019)
12 Dr Christian Brand, University of Oxford and UK Energy Research Centre | Dr Alistair Hunt, University of Bath, The health costs of air pollution from cars and vans (May 2018)

In addition to car displacement, it is important that e-scooters play a supportive role in improving intermodality with public transport. With e-scooter trials launching in the UK with the objective of relieving pressure on public transport during the pandemic, it has been difficult to support transport networks as a first/last mile solution. However, the potential for micromobility to boost passenger numbers and revenue for public transport, as we emerge from the pandemic, is clear. Voi is engaging with our markets to explore how our service can help to drive multi-modality and provide a feeder service, for example, to suburban railway stations and mobility hubs, and integration into regional ticketing systems.

In Voi's recent Summer Survey, only 17.39% of users responded that they had used public transport as part of their journey, demonstrating the success of the trials in easing the pressure on public transport during the pandemic. However, across continental Europe over 47% of users use e-scooters to connect with public transport. With lockdown measures now eased across England, and a number of transport partnerships in place including with Moovit, Citymapper, Zipabout & the Rail Delivery Group, there is significant opportunity for micromobility to emerge as a popular first/last mile solution and drive passenger growth across the public transport network.

Climate-neutral service

In addition to the air quality benefits of car displacement and modal shift, it is important that an e-scooter service itself is not having a negative environmental impact in its supply chain.

Our business model is based on maximising the value it produces for our city partners whilst minimising environmental impact. Voi's service is designed to be affordable, green and safe and we have taken steps to reduce our energy and resource consumption at each stage of our value chain. To this end, we are proud to have offered a completely climate-neutral service in all our cities since January 2020.

We have invested in understanding our environmental and social impact, continuously monitoring and improving it over time. Voi was the first operator to conduct and publish a full Life Cycle Assessment (LCA), which details all direct and indirect (scope 1–3) emissions linked to our service and scooters.

Using the LCA as the foundation of our sustainability work ensures we consider direct and indirect impacts along the service's entire lifecycle. Voi's LCA was independently performed by EY in accordance with ISO 14040 and ISO 14044 standards. To promote transparency in the industry, we allowed EY to publish the findings in an industry report.

Voi's Climate Action Plan reduces emissions along our value chain, from production to second-life and recycling. Our main drivers to reduce emissions are:

ACHIEVE NET ZERO OPERATIONS: Voi has transitioned to using 100% electric vehicles for all operations, including using cargo e-bikes for up to 70% of our operational tasks. All vehicles are powered by renewable energy.

EXTEND SCOOTER LIFESPAN TO +5 YEARS: The single most important strategy for reducing emissions is to extend the useful life of Voi vehicles. Through improved

design, proactive maintenance, and smart retention, we have achieved a 5+ year lifespan for our Voiager 4 and over 2600 charges in the operational lifespan of our batteries.

EMBRACE THE CIRCULAR ECONOMY: Voi is committed to reducing waste and energy consumption by using post-consumer recycled materials, reusing parts, and localising our supply chain.

Our sustainability initiatives have produced meaningful reductions. For example, we have been able to reduce production CO2e impact by improving the rate of recycled materials in the scooter, moving to swappable batteries, and securing second life applications. By 2030, we aim to have a zero-waste and circular supply chain and produce a zero-carbon scooter in Europe with 98% recycled materials. Our emission reduction targets have been verified by the Science Based Target initiative launched by WWF, UNDP and CDP, meaning that they are aligned with the 1.5°C pathway layed out in the Paris Agreement.

CASE STUDY

Swappable batteries

Swappable batteries is a leapfrog innovation that has optimised the efficiency of shared micromobility. Swappable batteries remove the need to transport entire scooters for charging and allow drained batteries to be swapped with charged ones on the ground.

Our Life Cycle Assessment estimates that swappable batteries have reduced Voi's overall emissions by 50%. Batteries are only accessible through an electronic command, and batteries are exclusively swapped by trained Voi staff in accordance with our Li-ion battery guideline, reviewed by experts. The sustainability and safety benefits of swappable batteries include:

OPERATIONAL EFFICIENCY. As only batteries must be transported, this reduces operational kilometers driven and energy consumption. E-vans and e-bikes can cover all operational tasks.

LIFESPAN GAINS. Less moving of the e-scooter reduces wear and tear, keeping the scooters safe for longer and extending lifespan. The V4 has an average lifespan of 5 years.

RESOURCE EFFICIENCY and increased vehicle availability. Since batteries are swapped in-field, vehicles stay in service. This means a smaller fleet can be used to provide more rides (and replace more car trips).

Recommendations

1.

The Department for Transport should ensure e-scooter services remain available to the public and prioritise primary legislation for the legalisation of e-scooters.

The popularity of e-scooters across the UK is undeniable, with 5.4 million trips being taken in Voi's towns and cities alone, replacing over two million car trips. If trials were to be stopped, all the progress made by cities, operators and local partners would be lost with users most likely to return to cars.

2.

Primary legislation should create a new classification of vehicles to cover e-scooters.

A new vehicle classification should be established by the Department for Transport for e-scooters, recognising the differences of an e-scooter from motor vehicles or electric assist pedal cycles (EAPCs). The new classification should provide operators the freedom to innovate, whilst still ensuring safe operations through measures such as appropriate insurance cover for rental schemes. The new classification should remove current regulations which have no impact on safety or sustainability, such as the requirement for provisional or full driving licences.

3.

Local authorities and operators should agree governance structures for the operation of shared scooter services.

Pre-agreed governance structures and decision-making processes between operators and local authorities will allow for e-scooter services to scale and expand to meet growing demand, whilst ensuring council and combined authority partners have the appropriate authority to ensure a safe service. Decisions should be made on the basis of agreed and objectively measured data-driven metrics.

4.

Local authorities should prioritise the development of cycling infrastructure to promote safe micromobility journeys.

With evidence showing good cycle lanes as a key factor in e-scooter safety, local authorities should prioritise investment into and the building of state-of-the-art cycle lanes to encourage sustainable forms of travel and discourage driving in private cars for short journeys.

5.

Councils and e-scooter operators should work together to find alternative parking solutions to pavement parking.

As more urban space becomes freed up due to fewer cars on the road, alternative parking solutions, such as on-street parking and parklets, should be prioritised to help keep pavements safe for pedestrians. With councils interpreting the law differently, the Department for Transport should issue guidance to streamline the process.

6.

The Department for Transport should ensure a level-playing field between rented and private e-scooters in any future legislation.

In order to achieve its climate change targets the government needs to embrace micromobility, but not at the expense of safety. Any legislation which permits the use of private e-scooter vehicles should include strict provisions over insurance and vehicle specifications such as maximum weight and speed to ensure safe travel.

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Cities made for living.

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