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Minister of State
Department for Transport
Great Minster House
33 Horseferry Road
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Dear Minister

PACTS comments on the DfT e-scooter evaluation report

We met last month at a roundtable event to discuss ways to improve the safety of e-scooter use, and the role of future regulation and other measures in this matter. A key contributor to the understanding of the safety of e-scooters and the form of any legislation is the appraisal of the rental trials now underway in England. The DfT published an evaluation report, in December 2022, which provides insights into the first 18 months of the rental e-scooter trials, from their launch in July 2020 to the end of December 2021.¹ PACTS has reviewed this report, supported by funding from The Road Safety Trust. We would like to offer comments on how the findings could be used to shape future regulation and suggest ways in which further data could be gathered to inform future decision making.

Background

The Government accelerated the introduction of e-scooter rental trials in the midst of the Covid-19 pandemic. One of the objectives of the schemes was ‘providing a safe mode of public transport’. The evaluation was designed to collect evidence about the safety, as well as benefits, public perceptions and wider impacts of e-scooters. Your department, in the Transport Select Committee’s 2020 report, is recorded as wanting “robust evidence to be able to produce robust advice.”²

We are surprised that none of the objectives for the report itself explicitly mention safety. Data on e-scooter usage and perceptions of safety are included but we would have liked to have seen more details of safety management systems employed by the local authorities and operators and an assessment of their safety outcomes. We suggest, below, ways in which a greater understanding of safety could be gained from the data which is being collected as part of the trials.

Construction

In the report users comment on a number of features of the construction of an e-scooter which affect their perception of safety. The rental trials operators have different features between fleets, all within the parameters set by the DfT. A quantitative analysis of the impact of these variations on safety would inform future legislation.

¹ [National evaluation of e-scooter trials report, 2022](#)

² [Third Report from the Transport Select Committee, Session 2019-21, ‘s 20 September 2020 report, E-scooters: pavement nuisance or transport innovation?, HC 255’](#)

Specific features of construction which impact safety and are referenced in the report are:

- wheel size - small wheels were said by users to make the e-scooter feel more likely to topple. Evidence from testing of e-scooters supports riders' perceptions and shows that users are at risk of falling due to instability. Larger wheels make e-scooters more able to withstand surface defects therefore increasing stability and control.³ Some operators taking part in the rental trials have developed their e-scooter designs to increase wheel size since the trials began in 2020.
- the inclusion of indicator lights - users raised concerns that stability is impacted when they have to take their hands off the handlebars to signal.
- suspension - many users considered suspension could be improved as this has an impact on their stability.
- controlling acceleration - some users found the e-scooter accelerated too easily and was hard to control, and this phenomenon has been verified by others' work.⁴

The evaluation report draws attention to users' concerns over their safety due to potholes and uneven road surfaces. However, equally, it might be concluded that this could be improved through development of e-scooter design or construction. Concern about riding with traffic is a common barrier to people cycling and improving on-road conditions for active travel could address this. However, it is unlikely that road surfaces are going to improve significantly in the near future or that extensive segregated provision will be made.

A feature which differs between operators and which impacts safety, is the power of the e-scooter motor. Following a consultation in 2020 the DfT permitted the trials to include e-scooter motors with a maximum continuous power (sometime referred to as the nominal power) of up to 500-watts. However, most rental e-scooters operate at 350-w with some at 250-w. From operator data available alongside the report there appears to be no notable difference in uptake of e-scooters in relation to power. The qualitative assessment shows no detrimental impact for users, including heavier riders.

Power has an impact on the acceleration of the e-scooter such that the higher the power, the greater the acceleration. Greater acceleration has negative safety impacts for riders and other road users. Testing has found a significant difference in acceleration between private e-scooters with 350-w and those with 500-w.⁵ The difference in acceleration between rental e-scooters with different powers is not referred to in the report. An assessment from the trials could inform decisions for future legislation.

Speed

Regardless of where e-scooters are used their speed has an impact on the safety of the rider and other road users. Higher speeds make collisions more likely and increase the severity of injuries. Riders are particularly susceptible to head and upper body injuries because of the upright riding position and the instability of the e-scooter. Other vulnerable road users are at more risk of serious injury if struck by an e-scooter at greater speed.

Within the rental trials speed limits (imposed by the local authority) range from 10mph to 15.5mph with the majority set at 12.5mph or lower. Some areas have go-slow zones limiting the speed further. Recommendations from medical professionals and academics are for speeds to be limited to

³ [Posirisuk P, Baker C, Ghajari M, *Computational prediction of head-ground impact kinematics in e-scooter falls*, *Accident Analysis & Prevention*, Volume 167, 2022, 106567, ISSN 0001-457](#)

⁴ [Eyers V, Parry I, Zaid M, *In-Depth Investigation of E-Scooter Performance*, TRL, January 2023](#)

⁵ [Eyers V, Parry I, Zaid M, *In-Depth Investigation of E-Scooter Performance*, TRL, January 2023](#)

12.5mph.^{6,7} There appears to be no noticeable reduction in use of e-scooters in areas with lower speeds. Comparison of safety outcomes between trial areas with differing speeds would be insightful.

Short-term renters are charged based on the length and duration of their e-scooter trip therefore suggesting riders may travel as fast as possible to maximise cost savings rather than safety. Using the example of the West of England Combined Authority (WECA) trial, trips for long-term renters, who are not charged for the duration of their rides, took on average 25% longer than for short-term renters. It would be informative to understand how short-term riders, who make up the majority of users, change their riding habits if charged for distance travelled rather than duration of the journey.

User behaviour

e-scooter riders must meet various criteria to use an e-scooter. While some behaviours, for example riding with a passenger or riding when intoxicated, are prohibited across all trials, age limit and possession of a driving licence, can vary between schemes. Analysis of the number of reported violations in rental trials could inform regulations in the future.

Some safety rules match those for driving a motor vehicle, therefore requiring riders to have knowledge of rules for road users and be at least 16 years old. The report records that some interview respondents thought the age limit for the use of an e-scooter should be even older at 18 years. Perceptions based on comparison with age limits which already relate to licences (for example 17 years for a car driver) would be more informative.

Safety is impacted by the methods used by operators to enforce the rules and could be improved through learning from the trials. For example, some rental operators restrict access to their fleet at certain times of the week. Others are informed, by third party reports, of irresponsible e-scooter use, aided by identification of each e-scooter from its unique number. Alerts are then sent to riders warning against irresponsible behaviour. The extent to which riders complied with these rules and the effectiveness of these measures to enforce them would inform future regulations.

Helmets

Stakeholders are recorded in the report as considering helmets to be important in protecting against serious injury of the head. Some trials areas provided helmets for riders to use, however, the wearing of helmets was not mandatory within any trial area, in part because of the perceived impact on uptake.

Not having a helmet made some users feel less safe. The rental schemes where helmets are provided by the operator included long-term rental users in WECA and Essex. The report notes that the use of helmets was greater in those areas where helmets were provided than elsewhere where riders had to provide their own helmet.

The extent of use of a helmet, comparison between short-term and long-term rentals, the effectiveness of encouragement to wear a helmet (financial incentives and in-app messaging) and safety outcomes would inform future decision making.

⁶ [Pepper, T., Barker, M., Smyth, D. et al. Electric scooters: a quick way to get to the emergency department?. *Br Dent J* **232**, 535–537 \(2022\)](#)

⁷ [Posirisuk P, Baker C, Ghajari M, *Computational prediction of head-ground impact kinematics in e-scooter falls*, *Accident Analysis & Prevention*, Volume 167, 2022, 106567, ISSN 0001-4575](#)

Training

The report documents that the proportion of riders who received some form of training reached 63% towards the end of 2021. The vast majority, over 90%, was given online training by the rental operator. Very little in person training was undertaken: 1% of users attended a course run by the operator and 1% attended a course run by a third party.

Riders found online training useful because it covered activating the e-scooter, paying for rides, and rules and restrictions of use as well as ease and speed of delivery. However, the report notes that first-time renters were roughly three times more likely to report having a collision on their most recent trip than those who have used e-scooters more than 20 times. No assessment of the effectiveness of online training in preventing falls was made in the report.

Riders reported improvements in their own capabilities as they became more experienced. This implies that more specific in-person training would be beneficial.

Perception of safety

Most users, in qualitative interviews, “reported feeling safe on e-scooters, [but] also considered them less safe than all other modes of transport, with the exception of mopeds and motorcycles”. This finding is unsurprising as the sample is less likely to include users who felt unsafe and did not return and those deterred from using them in the first place (at least 20% of those interviewed in autumn 2021 had used an e-scooter only once).

The resident survey, conducted in the second half of 2021, found that only 10% of residents had ridden a rental e-scooter. Women and older people were significantly more likely to say that safety concerns prevented them from renting one. Rental e-scooters were most popular with males under the age of 35. These are also the demographic who are most likely to be involved in road traffic collisions in general as well as specifically involving an e-scooter.

Casualty Data

Casualty data is important to assess the safety of e-scooters. It is available from a number of sources. We are disappointed that it did not feature more prominently in the evaluation report.

Evaluation report

The evaluation report notes that “gathering reliable safety data was a challenge.” References to collisions witnessed or in which an interviewed user or resident was involved are made; however those who suffered serious injuries were removed from the results. The reason for this was given as ethical considerations. Their removal means that the published results are not representative nor comparable with other data sources which include all severities of injury.

The rental trials usefully provide an indication of a rider’s level of experience as well as a log of the collisions from which no injury was recorded. This data can inform improvements to safety outcomes.

For collisions where an injury was suffered, analysis of the nature of the injuries sustained in the collisions would be helpful. A means of determining how those injured were travelling at the time of the collision would give an understanding of the type of road users injured in collisions involving e-scooters.

STATS19 data

The severity of injuries and types of road users involved in collisions with e-scooters are recorded by the police using a STATS19 form. They are included in the DfT’s annual ‘Reported Road Casualties

Great Britain'. Some extracts of this data have been used in the rental trial evaluation report. Data is included based on casualties reported to the police (STATS19) for six of the approximately 30 areas where trials were underway in 2021. These areas were selected because differentiation was made between rental and private e-scooter involvement. The report excluded analysis of the STATS19 data from which the severity of injuries, nature of collisions, age ranges of casualties etc. could have been gleaned.

Casualty rates

The evaluation report found that the casualty rate (per mile) for rental e-scooter users was three to four times that for pedal cyclists. As the report notes that most rental users would have walked or used public transport, the (much lower) casualty rates for these modes would have been a more valid and informative comparison.

Situation reports

Operators record incidents involving rental e-scooters and these are reported to the DfT by the operators or local authorities in situation reports. Details of the number and severity of reported injuries made by riders or other members of the public, as well as references to antisocial behaviour, damage and, in some cases, near misses are included. These reports have not been referenced in the evaluation report but could serve as a useful source of data. Comparison between operators' methods of collecting data would inform further data collection.

Collaborating with others

We are aware of two local authorities which are due to publish their own reports on casualties in spring 2023 which will include records from the police, from the operators and also from hospitals. These collaborations with well-established lines of communication between parties can generate greater understanding of casualty numbers. This has been demonstrated in Liverpool in a case study referenced in the evaluation report.

Implications for other road users

The evaluation report identifies a number of different ways in which e-scooter use impacts the safety of other road users. Residents reported feeling unsafe with e-scooters when walking, cycling or driving. Older people were significantly more likely to feel unsafe than young people. Disability groups have told PACTS of people whose independence is being limited by their fear of e-scooters.

Of the residents interviewed as part of the evaluation, over two thirds, across all age groups, felt people riding e-scooters were not respectful of pedestrians. Residents who walked felt safest around pedal bicycles and least safe around e-scooters. This was also the view of those who drove other motor vehicles or travelled by pedal cycle.

The experience of other road users is important and details of the level of injury to these other road users would be informative. Findings from the e-scooter user survey indicate that nearly 20% of e-scooter collisions involve other road users. In addition, situation reports record incidents where a pedestrian was injured but where the e-scooter rider did not stop. The STATS19 analysis for the whole of Great Britain for 2021 found that 15% of those injured in collisions involving an e-scooter were pedestrians. Another 5% were other vulnerable road users.

Parking

The first fatality involving a rental e-scooter was of an elderly pedestrian. He suffered a fall after attempting to move an e-scooter which was blocking the pavement. Situation reports can include more detail about the location and cause of an injury, in particular where this is the result of a collision with an unattended e-scooter.

Local authorities have adopted a variety of different parking systems for rental e-scooters: physically docked, marked docking areas, virtual docking, dockless parking, pavement docking or docking in road space. A quantitative assessment of the implications of these different options would inform responses to concerns from groups representing the disabled, and others. For example, on-road parking would leave pavements clear and could encourage users to ride on the road rather than pavement.

Pavement riding

User survey results document that over 20% of users ride on pavements despite only 6% reporting that they did not know pavement riding was banned. The evaluation report documents that concerns about pavement riding were particularly pronounced among people with mobility issues and blind or partially sighted participants.

There have been two criminal cases involving teenage e-scooter riders who have collided with pedestrians while using private e-scooters on a pavement. One pedestrian was an elderly woman who died, the other a six-year old child.^{8,9}

A comparison between the different types of education, incentives and developing technologies available to riders would assist in reallocating the responsibility for enforcement of the pavement riding ban beyond the police.

Geofencing

Geofencing technology has been used to control the extent and types of areas within which rental e-scooters can operate. This limits e-scooter use beyond larger areas defined by the local authority as well as preventing riding within parks, pedestrianised areas or private property. There are some safety concerns because geofencing is accurate only to a few metres. This means that e-scooters can slow down when they are local to, but not yet within areas. Geofencing is also not yet finessed sufficiently to prevent riding on pavements.

Assessment of the number, nature and size of no-go or go-slow zones within areas could improve protection for pedestrians. For example, what are the safety outcomes where e-scooter use is not restricted in pedestrianised areas compared to those where it is?

Contracts and future legislation

Within regulations set by the DfT, local authorities have been able to independently set contracts with operators. Some elements of these contracts have implications for the safety of riders and other road users. The evaluation report does not provide details of these differences but there will be opportunities for the DfT to learn from these different approaches. These include variations in e-scooter construction, speeds, different requirements for rider behaviour and varying level of active management of users. It is important that minimum standards which prioritise safety are set by the DfT for all local authority contracts. By carrying out equivalent assessments across rental areas outcomes can be objectively measured and safety standards raised. This data is important for local authorities to make evidence-based decisions to improve safety within their own areas.¹⁰ If standards are not mandated, some local authorities may be tempted to favour revenue over safety in tenders.

⁸ [Linda Davis: E-scooter rider, 14, sentenced over woman's death - BBC News](#)

⁹ [Teen's driving ban after boy's skull fractured in e-scooter crash - BBC News](#)

¹⁰ Urban Transport Group [The future of e-scooters \(urbantransportgroup.org\)](#) March 2022

Over the period of the evaluation report, and more so since the end of 2022, a number of trial schemes have closed. Reasons for these closures could inform the safety management and otherwise of remaining schemes.

Local variations

The report suggests that degrees of flexibility may be suitable when it comes to regulations of different rental e-scooter areas. The trials are run in large urban areas, small towns and between university campus sites. Clear differentiation between how these areas operate and evidence of the extent that local context plays in the safety of e-scooter riders or other road users would be helpful.

Any variation in regulations must not lead to greater confusion for the public. They travel between and beyond rental trials areas. As demonstrated by the nationwide use of private e-scooters, there is already an extensive confusion over the regulations for use of e-scooters.

Private e-scooter use

Findings from the evaluation could be used to inform regulation for private e-scooters. This should take account of the relative extent of use of the different e-scooters. PACTS is aware of over 30 deaths in GB since 2019 involving e-scooters. All but four of these involved private e-scooters.

The rental trials started with 37 scooters in July 2020. 23,000 were available in December 2021.¹¹ Over 18 months, across 32 trial areas in England 14.5 million rides were made by 1.4 million users. Over 50% of these users had ridden an e-scooter from 1 to 5 times. Across the period of July 2020 to December 2021 the net import of private e-scooters into the UK was approximately 800,000 units.

Further analysis to review the distribution of private e-scooter collisions local to and distant from rental trial areas could inform the possible interaction between rental trials and private e-scooter use. The six trial areas where STATS 19 data records rental and private e-scooter use would be well suited to this.

The report references the possibility of using long-term rentals in the trial within the large WECA area. More could be gained from an understanding of the safety outcomes for these users relative to short-term rental users there, especially as WECA is an area where STATS19 casualty data is available identifying rental and private e-scooter use.

Mode shift

Most e-scooter riders choose to rent an e-scooter in place of walking, cycling or using public transport. This has implications for road safety and active travel with potential consequences for public health and the NHS. We understood from DfT officials that the health disbenefits of less active travel would be assessed. We would welcome the input of health professionals to the evaluation.

Safety of different transport modes

Each mode of transport has an impact on the safety of the user (how hazardous the mode is) and on others (how dangerous the mode is). Mode shift to an e-scooter has an impact of safety outcomes for riders and other road users. Walking, cycling and public transport are safer (less dangerous) forms of transport than a private motor vehicle. As noted above, comparison of e-scooter casualty rates with walking and public transport would inform understanding of the relative levels of hazard between the modes.

¹¹ [National evaluation of e-scooter trials operator data tables](#)

Increasing trip lengths

The average e-scooter journey took 14 minutes to travel 2.2km (1.4 miles). Although not publicly available from the DfT, or in the evaluation report, it is known that the size of geo-fenced areas differ between trial areas. Comparison between the relative distances travelled could inform understanding of whether riders are willing to take longer journeys on an e-scooter if that were permitted. They may then be more inclined to replace private motor vehicles with a ride on an e-scooter.

Promoting active travel

The DfT is promoting active travel including the recent creation of Active Travel England. This executive agency's aim is to encourage more people to walk, wheel and cycle. The benefits of these forms of active travel include health improvements with the incorporation of physical exertion into everyday transport activities. e-scooters do not require physical exertion for a sustained period to propel them forward and therefore are not classified as a form of active travel.¹²

The Transport Select Committee, in their 2020 report, recommended that the promotion of active travel remain a key policy aim for your department and that e-scooter use, either rental or private, should not replace more healthy forms of travel including walking, cycling and kick-scooters. Primarily people should be encouraged to replace short car journeys with an e-scooter ride.

The average distance of an e-scooter journey would have taken a similar length of time if it had been cycled. With a number of operators and local authorities also running e-bike hire schemes there is the potential for comparison between the two on a number of aspects, including the number and nature of casualties. It is also noted in the report that the average distance of a bicycle journey is triple that of trial e-scooters suggesting that a bicycle journey would be more likely to replace longer journey previously made by car. Pedal cycling is a form of active travel and therefore brings the positive health impacts of physical exercise.

The report records that people often chose an e-scooter because they wanted to save time. However, when assessed in the evaluation, they assumed they were saving more time using an e-scooter than they actually did.

The rental e-scooter trial could provide a means to measure the effectiveness of different initiatives to encourage replacement of car journeys, over active travel. For example, pricing models, age limits, form of rental (long or short-term) and the size and land use of geofenced areas.

Personal safety

The report recorded that female participants chose to use an e-scooter when they considered it increased their personal safety especially when they would otherwise have been walking in the dark. Aspects of the rental trials which made this particularly beneficial should be assessed. For example, ease of hiring an e-scooter, information about safe routes and locations of docking bays.¹³

¹² [Simon Cook, Lorna Stevenson, Rachel Aldred, Matt Kendall, Tom Cohen, More than walking and cycling: What is 'active travel'? Transport Policy, Volume 126, 2022](#)

¹³ [Sherriff, A Blazejewski, L and Lomas, 'E-scooters in Greater Manchester', Sept 2022](#)

Conclusions

The publication of the evaluation report has provided some insights into the safety of rental e-scooters based on 18 months of data. Over a year of additional data has already been collected for 2022 and over a year of data is still to be collected to the end of May 2024. There is therefore the potential for more learning to be gained through improved data collection methods and further analysis of the collected data.

Representatives from your department have informed us that the extent of the evaluation, specifically through user and resident interviews, has reduced since the end of 2021. However, operator data and situation reports continue to be collected. There is therefore the opportunity for further understanding of safety outcomes.

It would be useful for an assessment of the impact of enhanced safety measures implemented in April 2022 to be made. These enhancements included lower speed limits for new riders, a minimum mandatory level of training, encouraging the use of helmets and improved accountability of riders, all measures which increase the safety of riders and other road users.

e-scooter use in the UK has grown significantly since the introduction of the rental trial schemes in July 2020. Those trials enable the collection of a breadth of data to inform the understanding of the use and safety of rental e-scooters. Information on the use of private e-scooters, however, remains inadequate and further data and analysis is needed in order that regulations for all e-scooters, which prioritise safety, could be drawn up.¹⁴

Your sincerely



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¹⁴ PACTS has made its contribution: [PACTS-The-safety-of-private-e-scooters-in-the-UK-Final-Report.pdf](#)