



accidents don't have to happen

UK E-scooter Safety Report



April 2022

Executive summary

As an emerging mode of transport, E-scooters offer a range of benefits to communities. Their growing popularity in cities across the world speaks to their promise of convenience, affordability and environmental sustainability. As with any emerging technology, E-scooters present some novel risks, and safety must be considered by manufacturers, operators, city authorities and riders.

This report considers the scale and nature of the injury risk associated with E-scooter use, drawn from data captured in 2020. It provides indicative comparisons with other transport modes, so as to assess the relative safety of E-scooters. The report assesses publicly available datasets and incident reports from Neuron, an E-scooter company participating in a number of trial locations.

In the summer of 2020, the Department for Transport (DfT) introduced regulatory changes that allowed E-scooter hire schemes across England to commence operation on a pilot basis. As of September 2021, 11 operators have participated in trials in over 50 towns and cities, operating around 20,000 E-scooters. In addition to these schemes, and despite it being illegal to ride them on public land, RoSPA estimates there to be more than 360,000 private E-scooters in use in Great Britain.

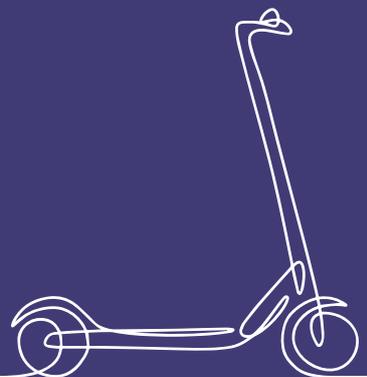
Given the emerging use of E-scooters, and the fact that 2020 was an outlier year because of the coronavirus pandemic, our conclusions remain limited and indicative.¹ Notwithstanding these factors, the key findings are as follows:

- E-scooters are safer than many other travel modes, with significantly lower casualty rates (0.66 collisions per million miles travelled) compared to bicycles which were 5 times more likely to be involved in a collision (3.33 per million miles) and motorbikes which were 9 times more likely to be involved in a collision (5.88 per million miles).

- The vast majority (94%) of incidents occurred in local authorities where there was no E-scooter rental scheme running.
- The risk to pedestrians, often the perceived most vulnerable group, is low. Collisions with pedestrians accounted for just 13% of incidents. In comparison, 79% of crash events were collisions involving a larger and powered vehicle, such as a motorbike, car, truck or lorry. It has not been possible to derive causation from this DfT dataset beyond vehicle/casualty involvement.

In 2020, DfT recorded, in its Stats19 database, 461 crashes that involved E-scooters in Great Britain. In addition, DfT estimated there to have been 484 casualties, including one fatality. Our review is based on the published dataset for the 461 crashes; and our calculations are derived from the 431 casualties provided within that untransformed dataset.

Our analysis demonstrates that, despite the continued debate surrounding the safety of E-scooters, we found that the risk of E-scooter accidents is lower than the risk of accidents on traditional modes such as motorbikes and bicycles.



Introduction

The Royal Society for the Prevention of Accidents (RoSPA) is a not-for-profit organisation dedicated to realising a 'life, free from serious accidental injury'. Our mission is to promote the exchange of life-enhancing skills and knowledge to reduce serious accidental injuries.

While E-scooters are lauded for their benefit to our cities, including helping them reach their net zero ambitions, complementing ageing public transport systems, providing a first/last mile solution to disconnected communities, and helping to revive local economies, public discussion has often focused on their safety, both to riders and to those on the roads and footpaths.

All transport modes currently carry a certain risk for accident and personal injury, but the novelty of E-scooters has led to accidents involving their use receiving extra attention. This report aims to identify the scale and nature of the risk of injury associated with E-scooter use. By identifying the rates of accidents, demographic factors associated with casualties, others impacted, and where and when accidents occurred, we consider the safety of E-scooters and make recommendations on how to reduce the risks associated with their use.

RoSPA has reviewed the UK incident records of Neuron Mobility, a leading E-scooter and E-bike operator, and has used the data to help assess the risk profile of E-scooters in comparison to alternative modes of road transport.

Privately owned and shared E-scooters

Shared E-scooter schemes have a range of safety innovations and stricter rules and regulations when compared to privately owned e-scooters which are currently illegal for use on public land. Rental E-scooters, which have been approved by the DfT, are fitted with GPS and geofencing which controls where they can be ridden and parked and their speed in different areas. With this technology the provider is able to set riding area boundaries, slow-zones, no-parking zones, and no-ride zones. Every trip is logged and all E-scooters have insurance.

Data sources, methodology and limitations

Government and open-source data: This research makes use of secondary data sources for 2020, obtained through the online repository maintained by the Department for Transport ('DfT').

In addition, this research includes a dataset used to create the "Reported road casualties Great Britain: E-scooter factsheet 2020",¹ published by the DfT.

Additional denominator datasets were obtained for walking and cycling travel from the National Travel Survey (NTS),² published by the DfT. Details on population estimates for 2020 were sourced from the Office for National Statistics' online records,³ to help determine rates of incidents.

Neuron Mobility incident metrics: Incident metrics for October 2020 to May 2021 were provided by Neuron Mobility Ltd. Neuron has kept detailed records of all reported incidents with its E-scooters since it first launched operations in the UK in October 2020. As part of reporting obligations for insurance purposes or as agreed with city councils, the company keeps an incident reporting log which is collected via its Customer Service team. Incidents are recorded by phone, email, or via the Neuron smartphone app.

Neuron tracks each reported incident and from the data it is possible to distinguish individual incidents that required medical attention where there is a record of an injured rider actually seeking medical treatment at a clinic or a hospital. Since this data is recorded for insurance purposes, it is likely to be, or to be very close to, an accurate reflection of the true number of accidents.

Calculations: Using the available dataset, we calculated rates of harm per unit, i.e. miles travelled, vehicle types, casualty type.

¹ Department for Transport, "Reported road casualties Great Britain: E-scooter factsheet 2020". Published 30 September 2021. Available [online](#).

² Department for Transport, "National Transport Survey 2020". Published 22 September 2021. Available [online](#).

³ Office for National Statistics. Available [online](#).

Limitations: There are a number of caveats to note with the available data:

The data relating to the cycling records, both the number of E-scooters and the recorded miles covered, are subject to estimates.

The publicly available Stats19 dataset is not the full or transformed dataset that DfT used to produce its 2020 E-scooter factsheet. In that document, DfT note: *“Our best estimate, after adjusting for changes in reporting by police, is that there were 128 seriously injured and 355 slightly injured.”*⁴ RoSPA has based its analysis on the publicly available, untransformed dataset, which totals 431 casualties for 2020.

Road safety statistics in Great Britain are based on personal-injury accidents that are reported to the police. However, a considerable proportion of non-fatal casualties, involving all forms of transport, are never reported.

Findings

E-scooter users had a lower casualty rate than other small vehicle users

In comparison to other common modes of transport, including motorcycles and pedal cycles, we observed comparatively lower casualty rates among E-scooter users.

Motorcycles, pedal cycles and buses showed higher crash rates, with an estimated 0.66 collisions for every million miles travelled on E-scooters, compared to 1.52 on buses, 3.33 for bicycles and 5.88 for motorbikes.

Crash by vehicle type, per million vehicle miles, 2020

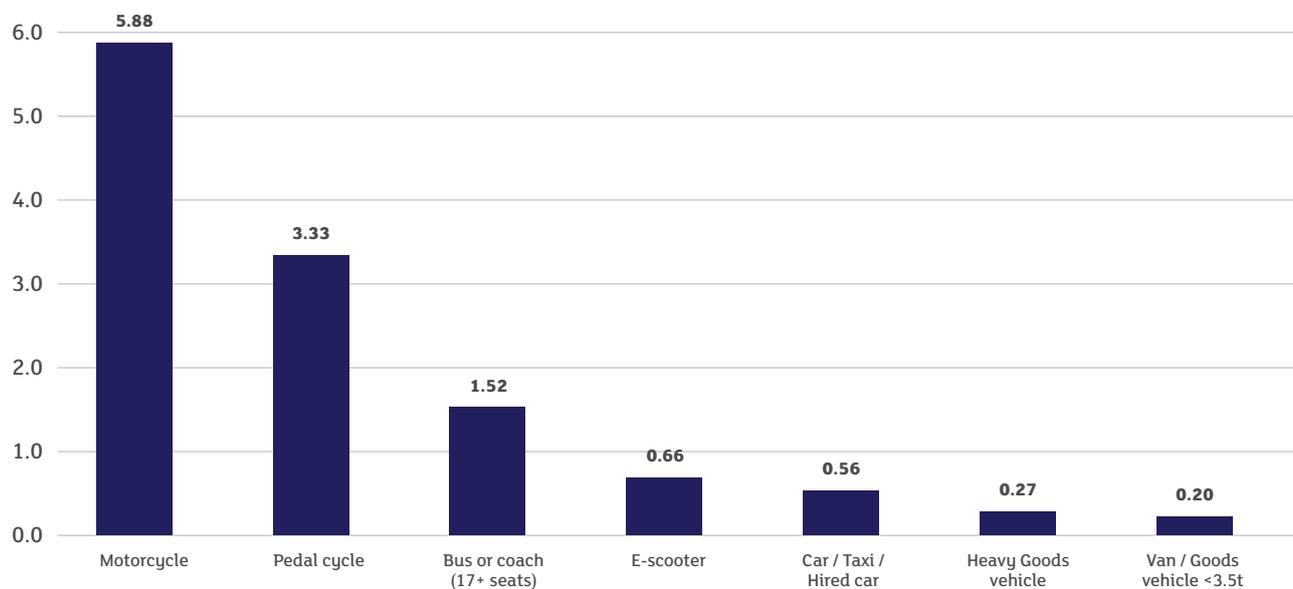


Figure 1: Crash event rate by vehicle type, per million miles, 2020

Source: DfT Stats19

⁴ Italics have been added by RoSPA. Source: Reported road casualties, [DfT website](#) (accessed 18 March 2022).

Majority of incidents occurred where there was no E-scooter rental scheme

In order to understand the safety of E-scooters within E-scooter rental trials versus privately owned E-scooters, data was compared from before and after 13 July 2020 (when the first E-scooter rental trial was introduced).

While it remains illegal⁵, sales of private E-scooters have grown considerably, with some retailers enjoying a year-on-year increase of over 90%. National data on the definitive number of privately owned E-scooters is not yet available, however RoSPA estimates there to be 360,000 private E-scooters in use in Great Britain. This should be considered a conservative figure, with a likely upwards revision of up to 750,000.⁶

It can be inferred that the incidents in local authorities with no rental scheme involved private E-scooters.

Data showed that there was a 94% higher rate of incidents in local authorities that had no E-scooter rental scheme in place than those local authorities with a rental scheme and regulated operators.

There were a total of 431 casualties recorded in the DfT dataset, and of these, 25% were reported before any rental trial schemes commenced.

One of these events was an incident on a Neuron E-scooter. To date, there have been no recorded fatalities on a Neuron E-scooter.



Figure 2: E-scooter incident distribution among local authorities, 2020

Data source: DfT Stats19 Dataset

⁵ Powered transporters - GOV.UK (www.gov.uk)

⁶ Electric Scooters: 14 Dec 2021: Hansard Written Answers – TheyWorkForYou.

Young and mid-life adult males are the most frequent casualties

The data shows that most casualties were male (77%), outnumbering females across all age groups. The majority of males involved in incidents were aged between 16 and 45; while female involvement was most

frequent between the ages of 26 and 55. The rate of incidents peaked at ages 26 to 35 years for both male and females.

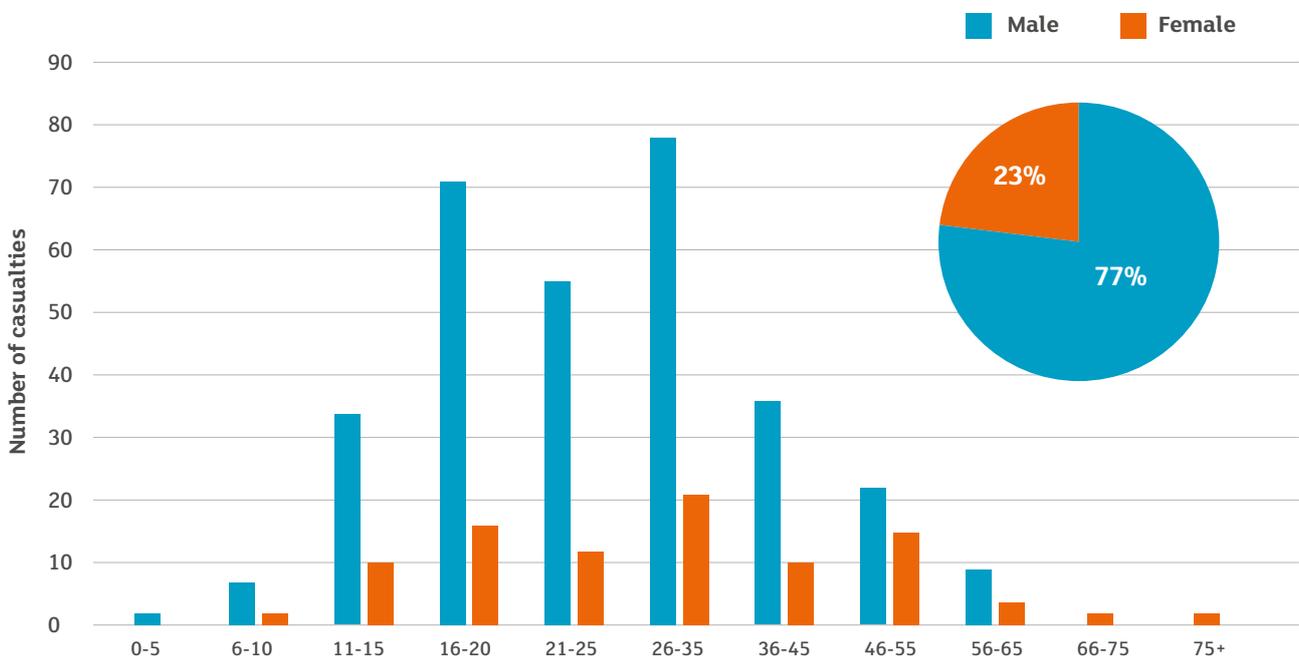


Figure 3: Distribution of casualties by age band and gender (N = 408)

Source: DfT, 2020

Most incidents happened during daylight hours

The majority of crash events happened during daylight hours, between 2pm and 6pm, with peaks at 3pm and 6pm. There were fewer than five events per hour during the night-time (from midnight until 6am), and no apparent spike associated with night-time economy.

Given the limitations of the night-time economy during 2020, we advise caution against any interpretation of the seasonal trend for 2020, as indicated above.

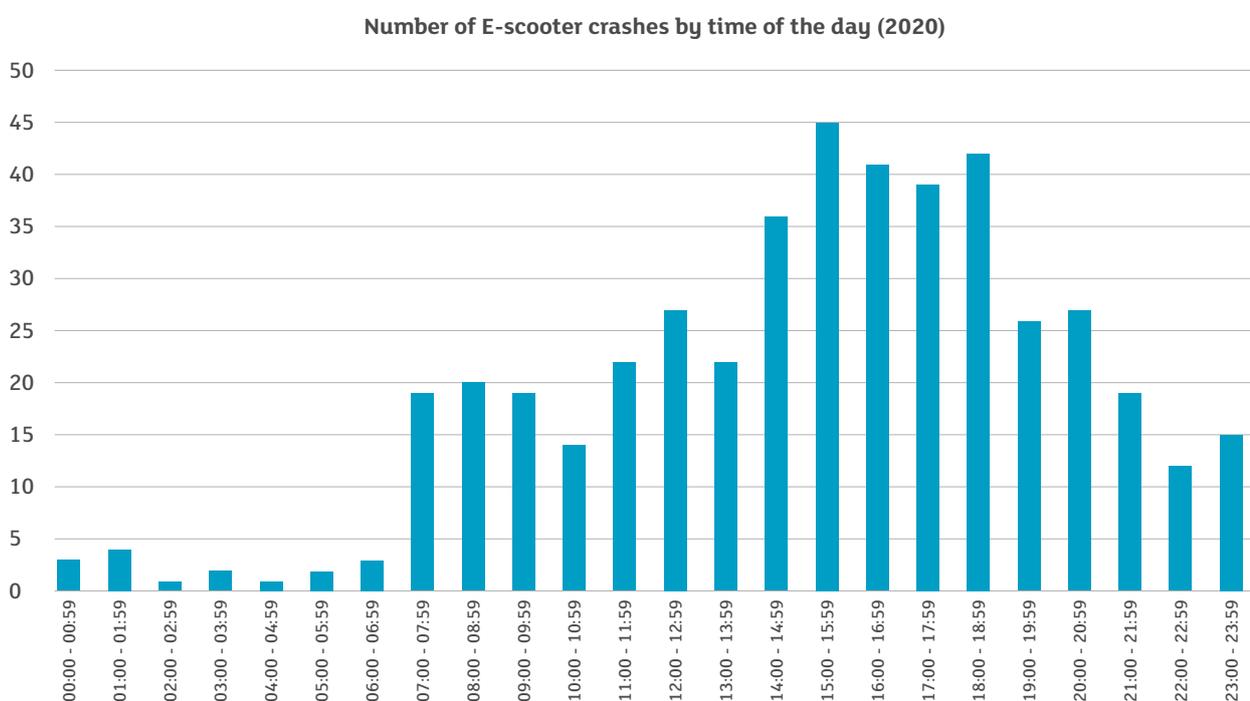


Figure 4: E-scooter crashes by time of day, 2020

Most events happened on unsegregated single carriageways

The data suggests that the overwhelming majority of crashes and casualties occurred on single carriageways (72%), with incidents on dual carriageways accounting for 10%. Incidents at roundabouts accounted for about 5% of total accidents.

In the UK, most single carriageways remain unsegregated, with bikes and E-scooters on the same surface as larger-powered vehicles.

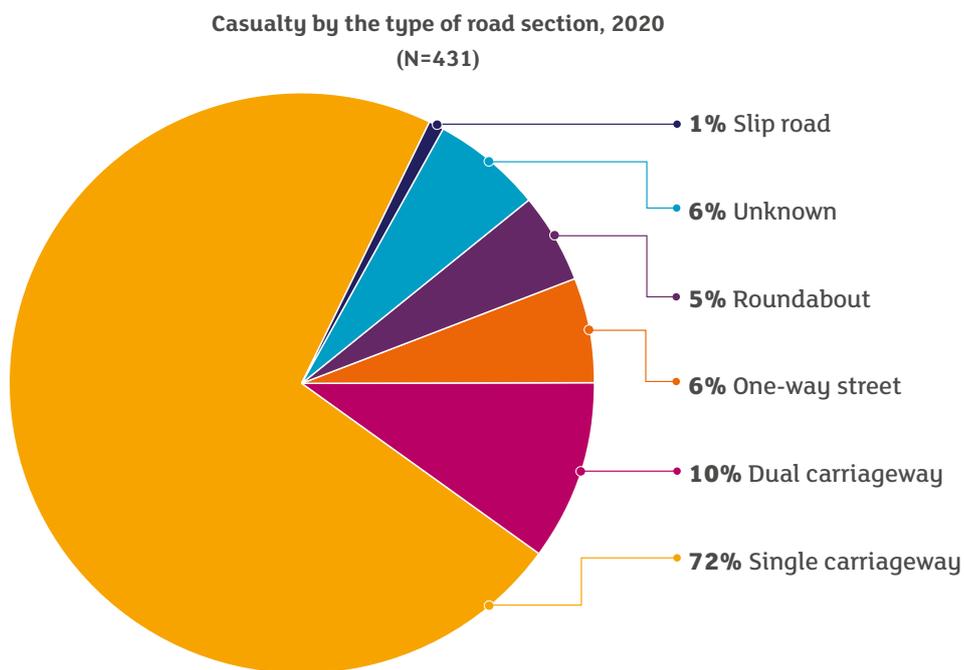


Figure 5: Distribution of E-scooter crashes by type of road section

Pedestrian collisions were far less frequent than collisions with larger, powered vehicles

The majority of crash events involving E-scooters (79%) also involved a larger and powered vehicle, such as a motorbike, car, truck or lorry. Data shows that cars were the most frequent other vehicle involved in collisions with E-scooters.

Collisions with pedestrians and/or unpowered vehicles were infrequent events in comparison, with nearly

13% of E-scooter crashes involving pedestrians and just 6% involving no other vehicles. Therefore, 'collisions with other vehicles' is still the most common cause of injury associated with E-scooter use.

It is not possible to derive causation from the DfT dataset beyond vehicle/casualty involvement.⁷

⁷ Email correspondence with DfT Stats19 Team (Date)⁷ and is our summation and conclusion from discussions with DfT.

Conclusions

The key finding is that E-scooters have lower casualty rates compared to other travel modes.

Our findings indicate that the risk to pedestrians is relatively low, despite the common perception. We also found that there was no significant rise in incidents in the evening, again contrary to the perception that

E-scooters are associated with anti-social behaviour around common pub closing times.

Private sales data and a more stable dataset (and a representative 'average' travel year to collect data) will enable firmer conclusions to be drawn in future.

Recommendations

These findings suggest some important safety factors that should be taken into consideration for future E-scooter use in UK.

- Given the rate of crashes that take place on single carriageways, further investment in road design improvements, including segregated bike and E-scooter lanes, would be beneficial.
- Safety standards should be applied to improve the visibility of E-scooters on the road, including those that relate to indication, lighting and braking.
- Providing mandatory training on the Highway Code and the practical operation of E-scooters would be beneficial for all users.
- Awareness and training on E-scooter behaviour for other road users, in particular car drivers, would be beneficial.
- E-scooter users should be encouraged to wear helmets when riding.

Whilst it's clear from the data available, that E-scooters in general carry a comparatively low risk to third parties and a risk for riders which is less than that of bicycle user's, safety must remain a focus for everyone involved in the E-scooter industry.

RoSPA encourages all E-scooter operators, and manufacturers of private E-scooters, to increase their focus on safety, including product design and manufacture, passive safety features and rider education programmes. We also encourage riders to follow the rules laid down in the Highway Code and to protect themselves by using lights, good road craft and a helmet.



accidents don't have to happen

RoSPA House
28 Calthorpe Road
Edgbaston
Birmingham
B15 1RP, UK

www.rosipa.com

© The Royal Society for the Prevention of Accidents

Registered Charity No. 207823

